BUSINESS AS REUSABLE

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Disclaimer

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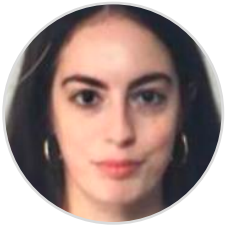
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Executive summary

The consumption of single-use plastics is a key contributing source to plastic pollution in marine environments. Plastic pollution not only poses a serious threat to ocean ecosystems but also has a significant implication for human health[1]. The EU Single Use Plastics Directive, which entered into force on the 3rd of July 2021, focuses on the environmental impacts and is aiming to reduce these by removing SUPs from the market of EU member state. Despite this Directive, single-use plastic consumption in the hospitality sector of Denmark remains a major issue. With the disposal of over 500 million single-use plastic items per year, the country appears to be barely meeting the EU requirements.Error! Bookmark not defined. To address this issue, the environmental NGO Oceana, which is dedicated to reducing plastic pollution in the oceans, commissioned us 30 Master's students from Wageningen University & Research. Consequently, our purpose was to investigate the current situation regarding single-use plastics in the hospitality sector in Copenhagen by means of identifying social, legislative, and economic barriers and enablers. Four themes are identified, which will cover our main findings.

The waiting game

We started by identifying various stakeholders which hold responsibility for the on-site SUP usage in Copenhagen's hospitality sector. This involvement is varying from either contributing to the problem or attempting to solve it. The interactions and relations between these different stakeholders have shaped a general lack of collective action towards the SUP issue. The ongoing dynamics between stakeholders is therefore characterized as 'the Waiting Game', where the responsibility to make positive changes bounces back and forth. Business owners are waiting for more favourable legislation to switch to reusable alternatives, and those who carry decision-making power, are waiting for other (or higher) governmental levels to act on it. Although some business owners do adopt small initiatives to decrease their SUP usage, these initiatives are not yet effective in changing the wider status quo.

To achieve a more effective and large-scale decrease in SUP consumption in Copenhagen's hospitality sector, business owners would benefit from supporting measures and legislation. This may provide further incentive to business owners to eventually make positive changes. Furthermore, support could be offered by facilitators such as NGOs, business associations, or alternative suppliers. Methods they can use to stimulate the decrease in SUPs use are social mobilization, creating awareness, or lobbying. However, we must emphasise that collective action is required among all stakeholders to overcome the identified barriers that are restricting the current situation. For the switch to sustainability regarding tableware usage, there is a need to increase the consume of reusable alternative, that is clear. However, the initial question here is how business owners perceive and already make use of alternative materials in general.

Businessowners: between perception and reality

At first glance, business owners broadly appear to be environmentally aware and highly acknowledge current problems regarding SUP use. Many business owners already offer reusable materials for on-site consumption for environmental, aesthetical, and economic reasons. SUPs are often even viewed as outdated material. However, chain establishments, who generally tend to be located in busy, touristic areas, might share this perception but feel compelled to use SUPs to meet consumer preferences by giving them the possibility to take it away. This perceived necessity of using SUPs also on-site is paradoxically at odds with the environmental awareness of business owners. Nevertheless, most of the business owners believe that they are generally on the right track – or doing the best they can. However, this narrative also harbours three beliefs that keep SUPs embedded in the status quo and block a transition towards reusable materials. First, recycling often acts as a justification for the ongoing plastic use. The perception of recycling in this matter equals the one of reusing material. Second, single-use plastics are seen as necessary for a smooth workflow and to serve the customer demand for convenience, such as the option for take-away. This perception is fuelled by the lack of on-site consumer demand for an alternative material. Third, single-use alternatives such as paper are viewed as an environmentally friendly substitute to single-use plastics. The single-use aspect is not perceived as harmful or environmentally unfriendly. On top of this, people are often unconscious of the plastic lining inside these paper options. Finally, while there is some sense of collective responsibility to make the hospitality sector move away from single-use plastics, it only exists within individual minds and is not translated into practice just yet. There is a lack of communication and collaboration between establishments which limits the opportunities to move away from SUPs.

Consumer perspective

If we look at the business owner's perception it is essential to also define the consumer ones. Business owners are highly influenced by customer demand and behaviour. However, their perception of what the consumer wants does not always correspond to reality. Like business owners, consumers in Copenhagen are aware of the negative impact of single-use plastics on the environment. The vast majority is willing to change to an alternative option, and even prefer reusables over disposable tableware however feel there is a lack of availability. Furthermore, a change in habits due to the Covid-19 pandemic has made health as well as hygiene a priority over sustainability for both consumers and businesses and has led to an increased use of single-use items.

Hospitality establishments with a large take-away clientele, such as fast-food restaurants and café chains, are the biggest single-use plastics contributors. There is often no distinction between tableware that is provided for take-away and the one for on-site consumption due to convenience for both businesses and consumers. Although a slight majority prefers reusable tableware in fast-food restaurants, many consumers value hygiene and convenience, and sometimes more than the quality or sustainability. Still, the quality of the alternative option stays an important criterion. Furthermore, wooden cutlery and cardboard straws are generally seen in a bad light, as they are not sturdy and do not provide a pleasant dining experience. Subsequently, a need for more effective alternatives and practices persists.

The route to follow

Our research thus states, that both consumers and business owners are keen on reusable alternatives to disposable options. We also found out that ceramic tableware is the most preferred option to substitute SUPs, due to its economic, environmental, and social values. This can serve as an entry argument to make the change more concrete and tangible. In addition, there are valuable lessons to be learned by the best practices in the EU. In Greece, the EU Directive has been transposed with additional targets under the Law 4736/2020 and been implemented in 2021. Specifically, at the island of Paros, an initiative "Common Seas" has partnered with 110 local businesses to provide them with information on plastic laws and a roadmap to reduce their plastic consumption. They also give information how to use reusable alternatives while keeping hygiene into account. The businesses that join the initiative of Common Seas must adhere to a couple of targets, such as not using plastic or biodegradable straws, and reducing their plastic cup use[5 27].

Furthermore, for on-site best practices in Copenhagen we found that asking if the order is for on-site or takeaway can help to diminish the SUPs usage immensely. As the material of tableware can then be decided accordingly, instead of automatically relying on SUPs, also serves the economic, social and environment values. We deduce from these best practices of countries, businesses, and organizations that they can provide inspiration for other places to also shift to alternative materials for overall consumption in food and beverage establishments.

Conclusions and key recommendations

The main results of the report can be formulated into the following key findings:

1. The fast-food chain is the biggest single-use plastic user in Copenhagen, with the plastic wraps as most used item.
2. The ongoing dynamics between stakeholders can be characterized as 'the Waiting Game', where the responsibility to make positive changes bounces back and forth.
3. The main barriers for business owners to switch towards reusable alternatives are:
    a. Misconceptions about recycling and single use alternatives like paper.
    b. The convenience aspect of single-use-plastic.
    c. Missing infrastructure for reusables and the lack of good alternatives for SUPs (especially for take-away).
4. Consumers are inclined to use reusable alternatives, but fall back on SUPs due to:
    a. Perceptions around hygiene.
    b. Convenience and social habits.
    c. Lack of available reusables.
5. The minimum legislative requirements that are imposed on SUP use hinders the transition towards reusable materials.

On the base of the identified barriers and enablers and best practices, we formulated recommendations for the reductions of SUPs within the dedicated hospitality sector. The aim of the recommendations is to provide a system that creates transparency for customers and an additional positive impact for the business owners. This is achieved through:

1. An educational campaign with the slogan *'recycling is not the solution, reusing is',* which could put emphasis on the different negative impacts of the recycling system.
2. Investing in research for innovative reusable alternatives to approach the challenge of high investment costs and the take-away overlap.
3. Best practices and subsidies by the national government to facilitate the transition towards reusable alternatives.
4. Installing shared infrastructure facilities to address the safety and health concerns regarding reusable alternatives, and to ensure the according standards.
5. An annual event, hosted by the business association, to connect the stakeholders and to promote new reusable initiatives.
6. The implementation of a certification system for e.g., plastic free restaurants.

A visualisation of the barriers, enablers, the resulting recommendations and short- and long-term steps can be found within the outreach product–Annex I.

TABLE OF CONTENTS

Acronyms

ALT	Alternative Supplier
BA	Business Association
BAR	Bars or Pub
BOI	Business Owner Interview
C	Cafe Non-Chain
CC	Cafe Chain
CDA	Critical Discourse Analysis
CS	Consumer Survey (overall)
DKK	Danish Krone
DRS	Deposit Refund Scheme
EU	European Union
FF	Fast-Food Non-Chain
FFC	Fast-Food Chain
GOV	Government
MCA	Multi-Criteria Analysis
MFA	Material Flow Analysis
MUT	Material User Test
NGO	Non-Governmental Organizations
OBAR	Consumer Observation Bar
OBS	Observation
OC	Consumer Observation Cafe Non-Chain
OCC	Consumer Observation Cafe Chain
OFC	Consumer Observation Fast-Food Non-Chain
OFF	Consumer Observation Fast-Food Chain
RTBO	Average Ranking Table Business Owner
SHA	Stakeholder Analysis
SPA	Social Practice Analysis
SUP	Single-Use Plastic
SW	Stakeholder Workshop
SWALT	Stakeholder Workshop Participant Alternative Supplier
SWBO	Stakeholder Workshop Participant Business Owner
SWBA	Stakeholder Workshop Business Association
SWGOV	Stakeholder Workshop Government
SWNGO	Stakeholder Workshop Participant NGO
UNEA	United Nations Environment Assembly

Introduction

Vast quantities of anthropogenic marine debris originate from plastics, creating islands of plastic waste floating in the ocean.[2] [3] This has created a global concern around the consumption of single-use plastics (SUPs) due to their negative impacts on both marine life and human health.[14] International environmental non-governmental organizations (NGOs), such as Oceana, dedicate their mission to reducing plastic pollution in the ocean. Despite these efforts, the degree of plastic pollution remains severe. The overall aim of this report is to help reduce SUP consumption by targeting one of the key sources, being the hospitality sector of Copenhagen, or more specifically, on-site SUP consumption in fast-food, cafe, and bar/pubs. This report has been compiled by a group of 30 students of Wageningen University and Research for a project commissioned by Oceana. The following sections will highlight the issue of SUPs in Copenhagen's hospitality sector and identify key barriers and enablers for switching to reusable alternatives.

General problem of Single-Use Plastics

People use SUPs once or for a short period of time before disposing of them. After being thrown away, only a small fraction of the SUPs are recycled. Most SUPs either end up in landfills or are incinerated (where the degradation process takes centuries), causing the loss of valuable resources that could have been recycled into new plastic products.[5] [6]

There are two major consequences associated with SUPs in the environment. The breakdown of SUPs into smaller sizes is the first concern. SUPs fragment into small pieces with diameters less than five millimeters, known as microplastics. Aquatic wildlife not only becomes entangled in these microplastics, but also suffer from ingestion. The second concern is that plastics like SUPs release contaminants into the environment, making them hazardous. For example, chemicals used in the production of plastic materials are known to be carcinogenic and to interfere with the body's endocrine system.[7]

Single-Use Plastics issue in Denmark

Despite the Single-Use Plastics Directive on the reduction of plastic waste that was implemented in 2019, the SUPs usage and consumption in the hospitality sector of Denmark remains an issue[6] [8]. Certain single-use plastics such as plates, cutlery and straws have been banned on the market in EU Member States as of 2021. However, compared to other EU countries, Denmark has taken some of the least ambitious actions in addressing this issue, currently meeting the bare minimum requirement[6] [9]. Published by Danish Environmental Protection Agency, 300 million plastics cups and 150 million food containers are disposed per year[10]. While 20% of the plastic waste is recycled, the overarching majority ends up being incinerated. This recycling rate is below the EU average recycling rate[11]. There are existing reusable alternatives that are becoming increasingly accessible, in addition to an observed general willingness to adopt these, though in the case of Denmark there has been no sign of decreasing SUP usage[6] ..[9] The continued use of SUPs can be explained by a series of different barriers that hinder the adoption of reusable alternatives. Enablers that minimize the SUP flow within the hospitality sectors thus should be identified [12] [13].

Research question

What are the social, legislative, and economic barriers and enablers of on-site SUP consumption in fast-food restaurants, cafe s, and bars/pubs in Copenhagen?

The enablers refer to those that support SUP reduction and barriers that prevent SUP reduction.

Roadmap

This report will follow with a brief section on the methodology that outlines the types of data collection methods. Thereafter, a short section presents the current SUP usage in Copenhagen and will point out the biggest SUP users.

This sets the stage for the main body, that investigates the barriers and enablers for switching to SUP alternatives. This is sub-divided into four chapters, each of which identifies a trending theme that has emerged from our results. Table 1 provides a comprehensive description of the main themes.

Table 1. *General description of the four different themes*

Theme name	Description
The Waiting Game	Explores two different 'waiting games' regarding the responsibility of different stakeholders who have diverging interests and influence regarding SUPs in Copenhagen. It further explores the facilitative role select actors can play in overcoming these waiting games.
Business owners: between perception and reality	Describes the perceptions on SUPs and reusable materials from the perspective of business owners, and how these perceptions have shaped the status quo.
Consumers: between quality and convenience	Discovers the perceptions and attitudes of consumers towards SUPs as well as alternative tableware, and dives into the problem of take-away materials overlapping with on-site consumption.
The route to follow	Presents information about the various alternatives, including perceptions of different alternatives and explores best practices for using alternatives in the EU.

Methodology

The study on SUPs in Copenhagen was comprised of three different phases: preparation for the field work, data collection and data analysis (Figure 1). The first phase of this research consisted of meeting with Oceana, desk research and other preparations for the fieldwork. In the second phase, we gathered different types of data with different collection methods, which will be discussed in a later section. We conducted the data collection methods in five different districts of Copenhagen: City centre, Vesterbro, Nørrebro og Nordvest, Frederiksberg, and Østerbro. In the final phase, the collected data from the five districts was compiled using various interdisciplinary analyses. The specific findings from each district are attached in Annex V.

Figure 1: Timeline for the methodology of the study.

Within the data collection, the hospitality sector was distinguished into the following categories: fast-food chain, fast-food non-chain, cafe chain, cafe non-chain and bars/pubs. The categories and other stakeholders were accordingly coded in their abbreviations and their corresponding districts (referenced throughout the report). A more elaborate description of the categories and the codebook can be found in Annex I & II. Furthermore, a distinction between different types of SUPs were made to demarcate the scope of this research. The list of SUPs can be found in Annex I.

The remainder of the methodology section will provide detail as to what each method of data collection entailed and why they were used. The explanation on how we analysed these collection methods data are displayed in Annex I.

Interviews: these were conducted to gain greater insight into how many SUPs are being used by a given establishment and their take on reusable alternatives. The focus group for interviews were business owners of establishments, in addition to other relevant stakeholders to the SUP issue (will be identified in Chapter 1). The questions focused on what are the enablers that support the hospitality sector to reduce SUPs usage and what barriers that prevent them switching to alternatives. The interview guideline for business owners can be found in the Annex IV.

Consumer survey: is aimed at investigating the lifestyle, beliefs and values of consumers in relation to on-site SUP (and reusable alternative) consumption in establishments. In addition, a weighing exercise was included to identify which aspects consumers value as most important when switching to alternatives. This was to get more insight into consumers' daily practices in relation to the use of SUPs.

Material User Tests (MUT): was created to gain a better perspective on consumers' preferences on alternative SUP tableware. The test was set up with four sets of tableware, made of four different materials (ceramic, bioplastic, paper

and plastic). With these four options, consumers were asked to rank them according to preference of use and asked to explain their choices. In addition, consumers were asked how much they are willing to pay for reusables and whether they would bring their own tableware given the options to do so.

Stakeholder workshop: was carried out to connect different stakeholders involved in the SUP issue in Copenhagen and generate discussion on the current barriers and enablers in place. The workshop consisted of two components:

1) Statements related to on-site SUPs consumption in hospitality sector were given. The stakeholders were then asked to voice their opinions and perspectives, whereafter they were also given a weighing exercise.
2) Stakeholders were asked to reflect on their roles by creating an interest and influence matrix. A MUT was also carried out to see how the stakeholders saw themselves as a 'consumer' stakeholder.

Observations consisted of three components:

1) Habits and behaviour of consumers in establishments: how many SUPs used per consumer, how many groups/individuals interact, what they do while eating on-site.
2) Number of SUP items used in one establishment in 30min.
3) If there was any visualization of stimulating alternatives/ SUPs in establishments (e.g, posters).

The current plastic empire Specific measurement instruments were created in order to execute the planned fieldwork in Copenhagen. Various categories were defined to add structure to the fieldwork: Fast food chain, Fast food non-chain, Café chain, Café non-chain and Bars/pubs. A more elaborate description can be found in annex II. Traditional restaurants were purposefully left out, since they do not use a substantial amount of SUPs for on-site consumption. Furthermore, a distinction between different types of SUPs was made to demarcate the scope of this research. The list of SUPs can be found in annex (x).

Given that the SUPs usage remains a problem in Copenhagen, the current flow was calculated to provide an understanding on the severity of plastic waste in the area and identify which category contributes to the highest SUP flow.

The total SUP pieces are calculated to be roughly 97,5 million pieces per year in Copenhagen, much of which ends up in landfills and incinerators (calculation explained in Annex III). When considering total amount of plastics used per year, chains are clearly the largest contributor, totalling to roughly 70% of SUPs in the hospitality sector (34,7 million SUP pieces in fast-food and 30 million in cafes). Fast-food chains were shown to be the highest SUP users: 36% of the SUPS come from this sector in Copenhagen. Moreover, cafe and fast-food non-chain appear to have lower influence in the SUP flow as they contribute three times less than chains (62 million and 13,5 million, respectively) (Figure 2).

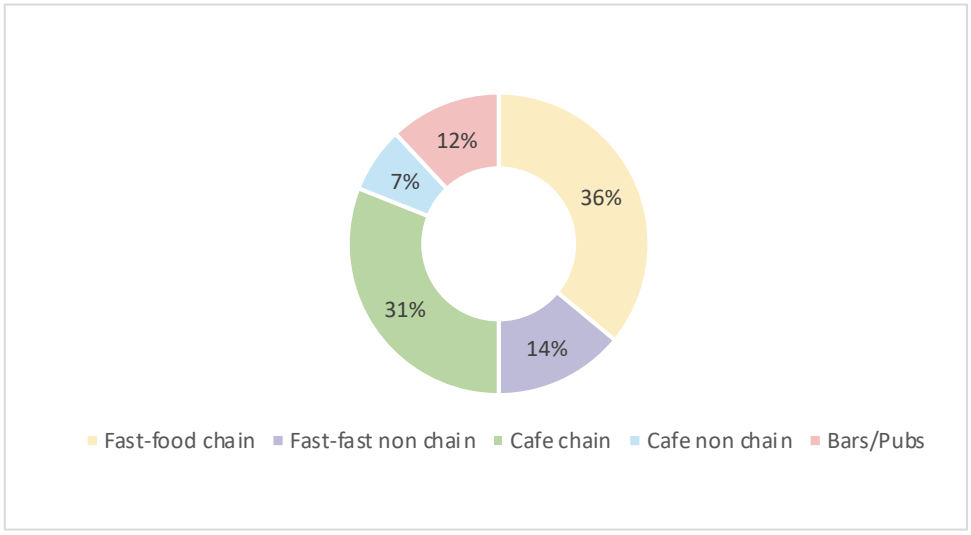


Figure 2: *Single-use plastics percentage calculated from different establishments per year in Copenhagen*

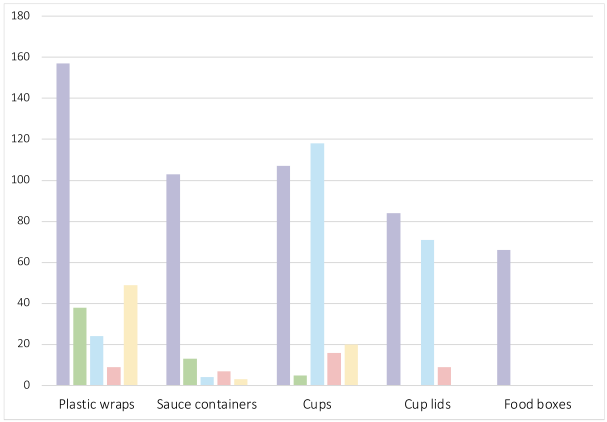


Figure 3: The five highest single-use plastic items observed in Copenhagen (in number of items)

In terms of quantity, the chains (734 pcs) offer about fourfold higher SUPs on-site than the non-chains (169 pcs). If we look in detail, fast-food chains highest SUPs items are plastic wraps, sauce containers, cup lids and food boxes (Figure 3). An exception is made for the cup item which was consumed the most in cafe chains. Non-chains (cafe, fast-food and bars/pubs) also use these mentioned SUP items such as cup lids (9 pcs) but at very minimal amounts.

The results imply that the main problem lies in chains and their plastic usage may have a significant impact on the environment (Annex III, Figure 15). Strategies and interventions should be prioritized in these chains as they contributed to the highest SUPs flow in Copenhagen.

CHAPTER 1 | The Waiting Game

There are a variety of stakeholders involved in the usage of on-site SUP consumption in Copenhagen. However, the stakeholder responsibility for addressing the issue is perceived differently for each actor. This is based on the network of relations between the different stakeholders that shape the dynamics of the 'waiting game' (illustrated in Figure 4). Two main waiting games can be identified, in which both games have two stakeholders waiting for one another to take the lead in decreasing the use of SUPs. The first waiting game includes the government and the business owners (orange arrows in Figure 4), while the second waiting game includes the business owners and the consumers (green arrows in Figure 4). This chapter will first illustrate the dynamics of the two waiting games, followed by an explanation of the facilitating role that other involved stakeholders, namely NGOs, business associations and alternative suppliers, can have in overcoming these waiting games.

Figure 4: Waiting game one (orange); Waiting game 2 (green)

1.1 The first waiting game

Within the government bodies, the main focus is on the municipalities. However, the national and European government also play an important role. The municipalities feel dependent on both the national and European government, as well as on the business owners to take the first step in addressing the SUP problem in Copenhagen (GOV-1, GOV-2). On the other hand, business owners feel like that the responsibility and capacity to act lies within the government. Due to this dynamic, both stakeholders are reluctant to take the first step and wait for one another while no effective progress is made.

The municipalities have limited influence on the policy and process of disposing of plastics. They are responsible for the waste policy, which covers everything from collection to handling. However, when it comes to policy on the usage of SUPs, it falls within the authority of the Danish national and European governments. Besides the EU directive on SUPs and the 'National Plan for Prevention and Management of Waste 2020-2032', there is a national competition law in force which limits the jurisdictional power of the municipalities[614]. Because of this law, legislation of SUPs in the hospitality

sector must come from the national or European government. Thus, the municipality has no room to maneuver in the field of legislation regarding SUPs in the hospitality sector. For example, the municipality cannot point towards a reusable solution for business owners, since from the many solutions available, this would only benefit one private company. As they explain: "*It is part of the competition law. […]as a municipality we must treat all businesses equal*" (GOV-1). Consequently, the municipalities perceive that further policy from upper levels of legislation is needed in order to take action. In this regard, NGOs agree on the fact that action from higher levels is required to minimize the SUP issue. Nevertheless, they argue for a more decisive role from the municipalities. They argue that implementations at the municipal level aimed at supporting and incentivizing the setting of a reusable system in the city are necessary (NGO-2). By incentivizing a bottom-up approach, progress achieved in Copenhagen can in turn lead to change at higher levels (NGO-2). NGOs further identify public opinion as an obstacle affecting the popularity of politicians in terms of votes and as such, NGOs have seen a tendency of Danish politicians to wait for EU legislation on plastic reduction, because it is perceived as an unpopular restriction by the Danish people (NGO-1, NGO-2).

Moreover, Copenhagen's business owners are looked upon to take the initiative against the SUP issue, as they are considered the most informed for undertaking changes within their sector thanks to their economic knowledge. As the municipalities state, "*I say this about the business owners, to take care of it […] they actually have the possibility to make real impact on their own business model.*" They express uncertainty on how to proceed without the proper knowledge and rather prefer positioning themselves as facilitators of change (GOV-2). In this regard, the municipality shows willingness to assist businesses in becoming more sustainable in terms of SUP use by offering tools to business owners who want to change their business model and become more sustainable, as they explained: "*we're trying to see […] how we can assist and help private companies to come up with some sort of solution*" (GOV-1).

Yet, it seems unlikely that business owners are going to take this first step in addressing the SUP problem. While many of them feel a responsibility and show willingness to reduce their SUP use, most of them identify that they are waiting for the government to act, as stated in an interview, "*mainly policy is needed to adapt and change the system*" (CC-1.2). Similarly, another business owner stated, "*and I think the other thing is that maybe the government here should make a regulation or some law*" (FF-5.1). Political action could both be a barrier and an enabler for business owners trying to switch to SUP alternatives. One current barrier that business owners encounter is the health and safety regulations targeting hygiene. This was indicated by, "*you have to use plastic containers for hygienic reasons*" (C-2.5). Conversely, an example of an enabler for business owners provided through legislation by the government is the implementation of a 'green tax' (FFC-1.1). As a business owner said, "*A tax could limit the amount of buying for sure.*" (FF- 4.1).

In essence, both actors appear to be aware and willing of the need for shifting to reusable alternatives, but both feel limited and uncertain on how to proceed. There is a waiting game in place, where the municipality feels stuck under the higher levels of governments. Meanwhile, business owners are waiting for either the municipal or national government to take the first step. Although different actors perceive the municipality as bearing more responsibility, the lack of knowledge on implementing the right solution for businesses and public opinion is limiting its range of action. On the other hand, business owners are also uncertain about how to proceed forward and prefer to wait for legislation to help them avoid taking wrong business decisions.

1.2 The second waiting game

Business owners have the most frequent and extensive interaction with consumers, of which the interplay serves as the second waiting game. Overall, business owners are hesitant to switch from SUPs to a reusable system because they fear losing clientele by not meeting customer demand. As one business owner explains, "*I don't want to talk bad about Danish people […] but they're a little bit lazy in all this stuff*" (C- 4.2). The consumers' dependency on convenience is not the only barrier, as another business owner expresses a concern consumers have regarding the hygiene of reusables, "*people don't want to use something that's used again and again... after corona*" (FF-1.2). The significant influence of consumers is recognized by the municipality, who states "*I think a lot of the push, the power, is with the consumer, because these companies will not just do it*'' (GOV-1). As they further elaborate, "*maybe they're just waiting for some legal framework creating a level playing field which would force the change*'' (GOV-1). This suggests that business owners are waiting for another stakeholder to push them to switch to reusables, but that consumer influence is propelling them in the opposite direction.

While Copenhagen's consumers have expressed awareness and concern for environmental issues related to SUPs, they do not see themselves as responsible for reducing their usage. In the survey carried out on consumers, more than half (64%) expressed their interest in using reusable tableware for on-site consumption, arguing for environmental impacts as one of their greatest concerns related to SUPs (CS). Such awareness was further confirmed during the interviews with business owners, wherein one consumer expressed their astonishment to the owner, "*Are you still using plastics?!*" (C-5.1). Despite the high level of awareness, data revealed that the average consumer in Copenhagen presents a passive attitude when visiting an establishment and is inclined to adapt to the type of tableware served. More specifically, 49%

of respondents are indifferent to establishments that have already implemented reusable alternatives, while 45% of respondents expressed their preference for establishments using reusable options for on-site consumption but do not actively seek such places, leaving only 6% of consumers actively looking for establishments using reusable alternatives (CS). The consumer's passive attitude was further verified during the material user test, whereby participants emphasised their reluctance for taking action to replace SUPs, "*I really just want somebody to make that hard decision for me. To say this is how it is*" (MUT-4). These preferences underly the consumer's expectation to be served with reusable alternatives by the establishment as part of the service they are offering. On the one hand this suggests a lack of initiative from the consumer side, while on the other it highlights the lack of option the consumer is given, because establishments have a tendency not to ask what type of tableware they prefer to be served in (OBS). The waiting for initiative then bounces back from the consumer to the business owner, as was highlighted in the stakeholder workshop "*consumer's behaviour can be changed if the system is changed first*" (SW). Altogether this highlights the second waiting game, where both consumers and business owners are waiting on the initiative from the other to change the system of switching to reusables.

1.3 Facilitation has no limitation

The lingering around for other stakeholders to act is not a foreign trend for business owners. However, there are a limited number of establishments who have taken their own initiative to tackle the SUP problem (will be elaborated on in theme 4, *The way forward*). Even so, these initiatives are too small-scale to change the status quo around SUP usage in Copenhagen. In order to achieve more effective and large-scale decrease in SUPs, the business owners need supporting measures that facilitate the transition to a reusable system in the hospitality sector. Our data analysis identified three stakeholders that can act as key facilitators for scaling up the reusable system in Copenhagen: NGOs, alternative suppliers, and business associations. To varying extents these stakeholders already take action towards making Copenhagen and more generally Denmark more sustainable, as will be exemplified. However, greater action is needed to scale up to a ubiquitous elimination of SUPs, as can be done by the mentioned stakeholders due to their more extensive network compared to individual business owners.

NGOs can help facilitate by spreading awareness around the SUP issue and accordingly creating social mobilization, in addition to lobbying for more ambitious policies. Firstly, an example can be taken from Danmarks Naturfredningsforening and their efforts to generate a larger understanding of waste prevention among the general public, "*we [are] also working a lot on how we can promote the ideas and the philosophy of waste prevention locally*" (NGO-2). Also, they organise an annual waste collection week that involves schools, associations, and private companies (NGO-2). Secondly, in terms of social mobilization, Plastic's Change approach has primarily been geared towards creating a guide for individuals on "*how to arrange your own beach clean-up*" (NGO-1). And finally, NGOs often collaborate with one another to provide consultation to policy makers. This can be at the local level, as Oceana has recently done through attending a town hall meeting with the municipality of Copenhagen (BA-1). Or at a higher political level, like Plastic Change is doing through actively lobbying at an EU-level by gaining accreditation to the United Nations Environment Assembly (UNEA, now making them an active participant in meetings at the UN (NGO-1).

Alternative suppliers are key stakeholders in providing business owners, and in turn consumers, with a well-functioning reusable system. The main provider currently operating in Denmark is Kleen hub, who provides cups and bowls. They identify in an interview that the reusable return system only works if people are willing to change their current practices (ALT-1). Conversely, a barrier identified for using their system is the 150DKK fee consumers get charged if they do not return the reusable item within 10 days. Because consumers are often not certain that if they will be able to meet this time limit, they decide to not take the reusable option (BA-1). Given that Kleen hub is still a new initiative, their availability within establishments is still limited, and therefore the possibility for consumers to return their reusables is too. As they continue grow their network, the return barrier can be eliminated, and thus provide a widespread reusable system in Copenhagen.

Business associations can act as a key facilitator by providing a line of communication between business owners and other relevant stakeholders. In doing so they can relay crucial information to business owners, and conversely represent business owners' interests and concerns to other stakeholders. For example, the Host has recently worked on helping establishments shift to a more sustainable form of operating by creating an informative 'sustainability bible for business owners' (BA-1). An example of the latter is Horesta's recent project with the National Environmental Protection Agency, that in collaboration are working on alternative solutions for plastic packaging and tableware being used in establishments (BA-2).

1.4 Conclusion

Overall, the interaction and relations between the different stakeholders has shaped a general lack of collective action towards the SUP issue. The ongoing dynamics between the stakeholders resembles a waiting game where the responsibility bounces back and forth. As a result, efforts to tackle the issue are characterized by small-scale effectiveness.

In order to achieve a broader change that can impact habits and beliefs surrounding SUPs, there is the need for increased cooperation between different actors. Of note, stakeholders hold different levels of interest and influence towards the issue that are necessary to take into account when looking at responsibility (Annex III Figure 16). Therefore, a greater collective action is required among all stakeholders to overcome the barriers that are restricting the current situation.

CHAPTER 2 | Business owners: between perception and reality

The previous chapter highlighted that the stakeholders at play are to various extents waiting for each other to undertake action that could change the current situation. But what does the status quo look like, and how is it constituted? This theme puts the businesses owners at centre stage and investigates the perceptions businessowners have surrounding SUPs and how this shapes their current actions. These findings are drawn from the business owner interviews, the consumer observations and the ranking table for business owners. Overall, businesses from all categorizations think they are 'on the right track', when it comes to reducing SUPs in the workplace. To some extent, this perception is justified. However, this narrative also harbours three beliefs that keep SUPs embedded in the status quo or block a transition towards reusable materials: that recycling (at least partly) condones SUP use, that SUPs are necessary for convenience and consumer demand, and that single use alternatives are environmentally friendly substitutes of SUPs.

2.1 On the right track!

"*The green capital of the world*" [15] or "*the worlds' most sustainable city*" [16] are just a few of the titles that Copenhagen receives in international news articles. Copenhagen's green narrative and the Danish fondness on recycling has not only captured the international media but proliferates within its hospitality sector as well. One cafe manager stated that "*We take care of the earth, people are thinking about it.*" (C-2.5). Another manager expressed that: "*I think that here in Copenhagen, they [businesses] are super conscious about the plastics and the contamination*" (FF-2.2). In recent years, the hospitality sector has undertaken various actions to reduce their carbon footprint, something that is well received: "*But I mean, [the hospitality sector is] pretty great at becoming more sustainable.*" (FFC-5.1) Adding to this narrative, the business associations carried out various projects to reduce the use of SUPs and replace them with sustainable materials. (BA-1, BA-2).

At first glance, business owners are environmentally aware and highly acknowledge the current problems regarding SUP use. Many venues already provide reusable alternatives, with most non-chain cafe owners already having ceramics as the only option for eating and drinking on-site. Business owners regard carbon impact as the most important reason to choose reusable materials (criteria ranking). Their reasoning is not limited to environmental aspects however, since they also value the aesthetics that come with ceramics, glass and metal (See Figure 5). As one business owner claimed, "*Why use plastic if you can use ceramics?*" (C-5.1). Most business owners do see economic benefits in having reusables as they would not have to buy materials every month. Moreover, business owners value acquiring a green image for their brand and aim to meet the 'green' customer demand of Copenhagen. SUPs are often viewed as an outdated material. For instance, small local cafes in calm neighbourhoods cannot possibly imagine why they would offer SUPs on-site, "*only an idiot would do that!*" (C-5.1). While – mostly – chains in busy, touristic areas share this perception, they feel compelled to use SUPs to provide the consumers with the best quality of their beverage and the possibility to take it away.

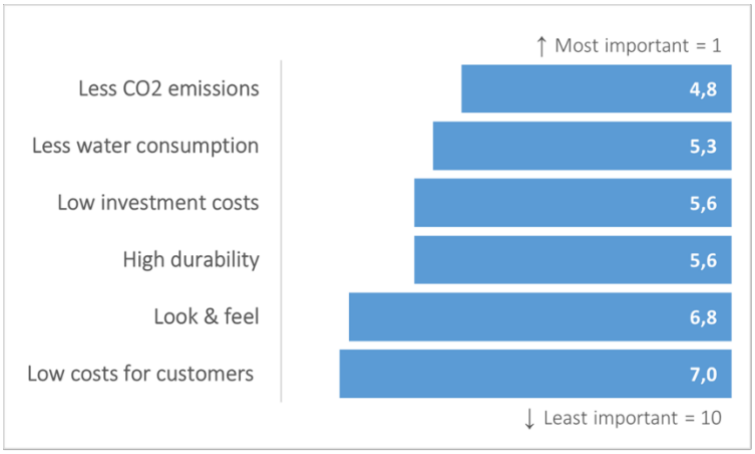


Figure 5: Average ranking preference of business owners for different criteria to consider when choosing a reusable material.

On a positive note, business owners are convinced that their sector can improve in the near future. There is a sense of shared responsibility to address the issue. One manager said: "*I should try to change but I think if I asked my boss for this kind of [reusable] cutlery, it is complicated*" (FF-5.1). Another employee adds that: "I *think the responsibility is for the owner of the place, they can change and try to find another solution.*" (C-4.2).

Finally, despite this sustainable optimism, we identified no visual 'eco-branding' or any environmental activism within venues. Even the establishments that offer sustainable options, such as bringing your own cup or reusable alternatives on-site, do not clearly communicate this towards the consumers through posters or advertisements. On the other hand, consumers also do not express their demands through activism within the city. The section above would suggest that this is not necessary since sustainability is widely perceived to be the norm already. But is this the case?

2.2 Three bumps in the road

The environmental awareness of business owners as outlined above conflicts with their perceived need for SUPs. Business owners are stuck in a work routine in which the usage of SUPs is strongly present. This is complicated by the idea that 'the business' serves a different identity than the individual, as one bar owner explained, "*I'm not as environmentally aware in my workplace, as I am in my personal life.*'' (BAR-1.1). Business owners often state that they do not have the time, opportunity, practicalities or motivation to make an actual change in their business. Nevertheless, most of the business owners believe that they are doing the best they can. However, this narrative manifest three beliefs that strengthen the use of SUPs or hinder the transition towards reusables: about recycling, convenience, and single use alternatives.

First, businesses that to various extents use SUPs within their venue tend to view them through the rose-coloured glasses of recycling. Whenever we asked about their SUP use, participants would proclaim their recycling rates, which are perceived as an important part of becoming more sustainable. Contrastingly, there is also a fair number of venues – mostly small fast-food restaurants in busy neighbourhoods – that do not know or have the facilities to dispose properly. What raises further doubts, is the observation that many venues do not have recycling bins available for their consumers. However, this does not refute the general idea that recycling is very important in Copenhagen. For some functions, business owners generally think that plastic is the only material in terms of price and performance. It is cheap, easy to use, and does not affect the taste of the product. The latter is also stressed by the business association, showing the embeddedness of this perception. Hence it seems that the importance of recycling acts as a justification for the ongoing plastic use. As one cafe chain owner states: "They [the recycling rates] are 40% at the moment. But by 2024. They will be 100% That's the goal at the moment." (CC-5.1). However, recycling is not the answer to the SUP waste crisis, since consumption levels are rising and waste streams increasing, while not all materials are actually recycled [17].

Second, convenience, especially for fast food, is one of the main drivers of the status quo. Phrased by an employee in a fast-food chain as: "*it's a lot easier to just give something to someone and then they can throw it out. You don't have to wash it and clean it.*" (FFC-1.1). Convenience can be as simple as plastic being the best material to keep an iced coffee cold. However, more fundamental is that business owners are convinced that consumers want a quick and easy dinner, including the option to take it away, even when they are eating on-site. This opinion is strengthened by their experience that consumers barely ask for reusables and would even steal the reusable materials, such as metal straws. Additionally, they believe that consumers find reusable options unhygienic – especially after the COVID-19 pandemic. This is an important barrier since fast-food restaurants regard the customer experience as the most important when considering materials for on-site consumption (MUT). Several also argue that they first would like to see the consumers demand change and are then willing to adjust. In other words, sticking to convenience is defended by responding to customer demand. Other arguments that support the use of SUPs are the 'come and go' nature of tourism, the investment costs of switching, and the lack of infrastructure and available space for reusables. Contrary to smaller cafes, cafe chains often argue that their days are so hectic that they must use plastic, otherwise they would have to buy too many ceramics or glasses. Putting this together, the persistent character of SUPs becomes clear. The inconvenience of 'changing the system', keeps SUPs in use.

Third, single-use alternatives such as paper and wood are viewed as the environmentally friendly substitute for SUPs. We constantly find that this type of tableware is excluded from elements that pollute the environment. The plastic layers that are often found on these single-use alternatives are collectively overlooked and the 'single-use aspect' is not seen as a problem. One fast food manager explains, "*The boxes we use a lot. But the carton is recycled, so it is good. We don't use plastic boxes.*" (FF-5.1) It is currently viewed as 'the best option', which is strengthened by the fact that the hospitality business association also believes that finding another alternative is very difficult. Again, aesthetics play an important role since the look and feel of paper is preferred over that of plastic. This belief further embeds the non-reusable materials within business models. In practice, most paper cups and bowls end up in landfill due to its small plastic layer [18], while pizza boxes that come into contact with grease can no longer be recycled [19]. One important exception is the paper straw,

which is commonly perceived as highly unpleasant. One owner even argues that they give two straws by default. However, since the reusable straws have their own defects, the paper straw is seen as the best of the worst (Figure 6).

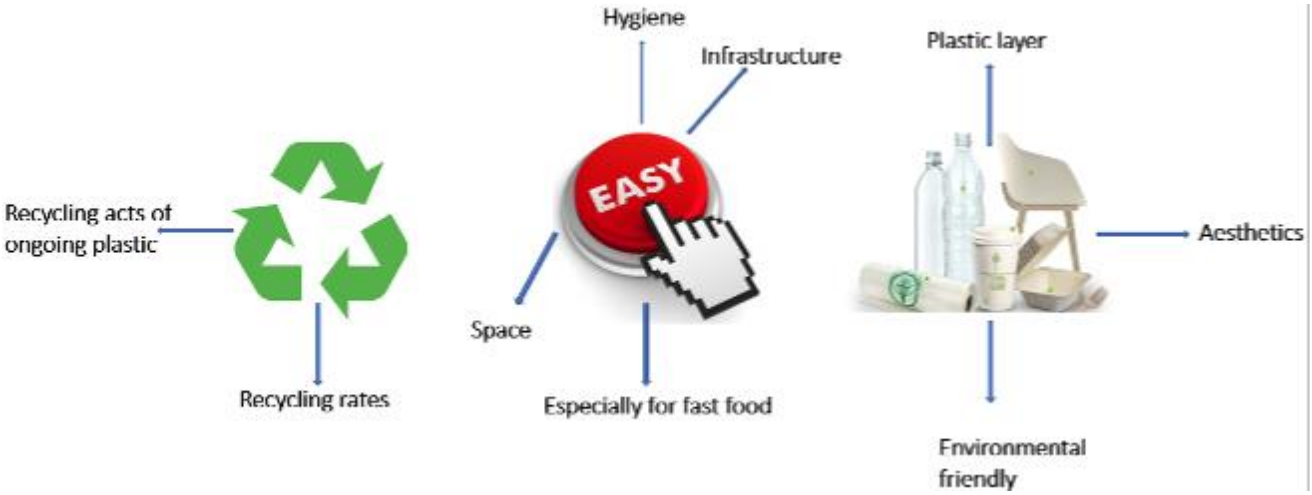


Figure 6: Three beliefs that strengthen the use of SUPs or hinder the transition towards reusables

2.3 Conclusion

The overall preference for reusables and acknowledgement of responsibility portrays promising grounds for change. The barriers we identified in this chapter, however, are the current views of business owners on recycling, convenience and single-use alternatives. Contrastingly, the customer demand emerges as both an enabler and a barrier for SUP provision. According to various business owners, consumers demand for SUPs in fast-food restaurants, but for reusables in cafe s. The next chapter will dive deeper into this contrasting finding from the perspective of consumers themselves and show to what extent the perceptions of businessowners are correct. Finally, while there seems to be some sense of collective responsibility that could enable change, this only exists within individual minds. There is a lack of communication and collaboration between establishments that limits the opportunities to move away from SUPs, which acts as another barrier.

When it comes to sustainable materials, there exists a discrepancy between how the business owners believe they are doing versus their actual performance, which hinders the move away from SUPs.

CHAPTER 3 | Consumers: between quality and convenience

Business owners seem to know what consumers want, but are they right? This chapter highlights the attitudes and perceptions of consumers and tries to explain their current behaviour. From the perspective of a consumer, we have identified several factors that enable but also hinder the demand to switch to alternatives. These findings are drawn from the consumer surveys, the material user test and consumer observations. Overall, consumers seem to be aware of the dangers of SUPs, but simultaneously do not always act accordingly.

Our research has pointed out that 65% of respondents were either very or extremely interested in using alternatives to SUPs and only 5% were not interested at all (see Figure 7). Interestingly, several of those who said that they have no preference mentioned that they would still prefer it, but it is not available (CS).

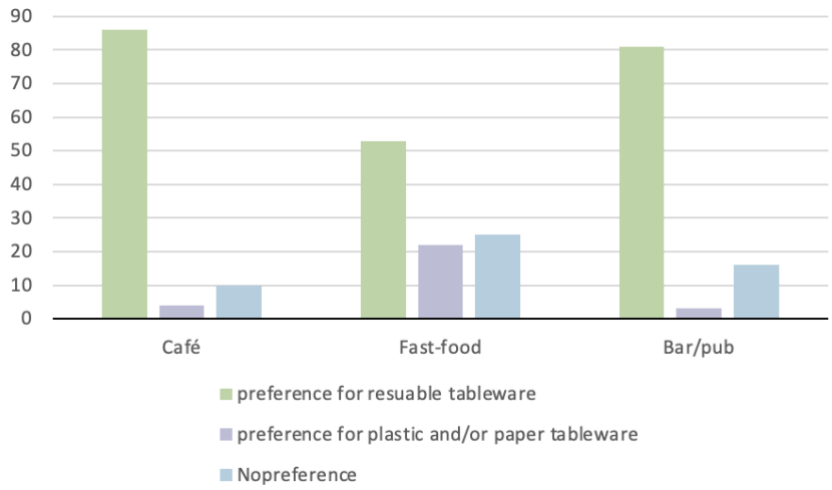


Figure 7: Consumers' preference for various types of tableware in cafe s, bars and fast-food restaurants in Copenhagen (in percentages).

3.1 Perceptions

It's good if it doesn't taste like wood

Generally, consumers hold a high environmental awareness about the negative contributions of SUPs. For instance, many survey respondents prefer reusable materials for environmental reasons and expressed concern regarding the high use of SUPs and the plastic pollution it produces.

Furthermore, the design and aesthetics of the alternative options are important to consumers. Especially from the MUT, it can be concluded that the traditional set of ceramics is the most preferred material for on-site consumption, followed by bio reusable plastic. People prefer what they consider to be "homey", "cozy" ("hygge" – the Danish word to describe coziness) or something they are familiar with. As one participant stated, "*it is more about the vibe, it feels like home*." Whereas aesthetic and familiarity played an important role for participants when choosing the tableware bundle, consumers in the survey ranked the look and feel of the alternative as a less important criteria. Still, they did mention the importance of familiarity and cosiness when explaining why they preferred reusable materials.

In addition, the general dining experience (e.g., touch and mouthfeel of the materials) was also rated as important when considering alternatives. Ceramics were said to feel sturdy and stable, thereby offering a pleasant dining experience rather than a soggy paper straw. Consumers mentioned that reusables leave the food or drinks with a more neutral taste, as opposed to plastic, paper or wood. The availability of high-quality reusable alternatives can serve as an enabler for consumers to make the switch to alternatives. This is supported by our findings that indicate consumers are willing to pay around 10% extra if an establishment were to implement reusable alternatives.

I can't, I won't, I don't

Consumers clearly show that they are willing to change to reusables. This raises the question, however, why this is currently not the case. To answer this question, five barriers have been identified that keep the consumer from pushing for this change: persistent misconceptions, the COVID-19 pandemic, the quality of reusable alternatives, the lack of available alternatives on site, and convenience.

The first barrier relates to existing misconceptions, such as the material composition of non-reusables, the waste management system and how to recycle. Some consumers are unaware of the material composition of non-reusable tableware, including SUPs. For example, consumers do not know that there is plastic inside of the paper take-away cups (OC-1.1). Similarly, they also seem to wrongly recycle their non-reusable materials. The question remains whether this is due to a lack of knowledge or other reasons, such as unclear recycling facilities. During several observations, consumers disposed their plastic cups including paper straws in the plastic bin. From this, we deduced that some consumers and business owners do not know how the waste management system works, or simply do not care. Therefore, some consumers find it useless to recycle and use alternatives. One consumer stated, "*Plastic is a politicised climate focus because companies can use greenwashing for something that only makes a small difference. In Denmark, we burn/incinerate our waste, so plastic does not end up in the ocean and only takes up a small part of our CO2 emissions*" (CS). Research however shows that in Europe, approximately 27.1 Mt. of plastic waste was collected in 2016. Of this amount 31.1% was recycled, and 41.6% was subjected to energy recovery methods (incineration). Just over a quarter (27.3%) ended up in landfills.[2021]Just over a quarter (27.3%) ended up in landfills.[20 21]

Second, before the COVID-19 pandemic, the shift to reusable alternatives started to gain more substance. However, the pandemic reversed this shift and made health and hygiene a priority over sustainability for both consumers and businesses. Consequently, influenced by the COVID-19 measurements, consumers have returned to their old habits of using SUPs. Before the pandemic started, a larger part of consumers used to bring their own cups to hospitality establishments, whereas nowadays we notice that barely any consumers bring their own tableware (C-2.8, OBS). It seems that this is due to changed habits. As two consumers mentioned, "*remembering them [own tableware] is a hard habit to build*" and "*it's hard to change habits.*" On top of that, consumers think that there is a hygiene risk when using reusable tableware, as a consumer said, "*Because of Corona, I've probably become more concerned about how hygienic it [reusable items] is.*"

Third, the quality of alternative tableware is important for consumers, which explains why the reusable plastic set and the disposable paper were ranked the least preferred. Consumers seem to not appreciate the taste of wooden cutlery, the inconsistent durability of paper straws and the weakness of paper plates and cups. A lot of statements were made about the straws. Participants said things like "paper straws dissolve easily" and "turn wet and soggy and are ruined if you don't drink your drink fast enough" (CS). This was further confirmed by business owners, with one bar manager stating, "*We had the paper straws, and they were pretty bad. And there was a lot of complaints*" (BAR-3.1). In addition, participants argued that wood sometimes gives a strange taste while eating. The negative associations with single use alternatives could mean that consumers are fonder of reusables. However, this is not always the case. The plastic reusable set was mainly criticized for its looks and design as it was seen the most as "*cheap trash*", even though it could be reused. The reusable plastic felt weak, and the cutlery was hard to eat with, too thin, uncomfortable and not pleasant for the eyes. This indicates that the poor quality and lack of proper SUP alternatives can act as a barrier to change and suggests that investments should be made in the development of SUP alternatives which comply with specific quality standards.

Fourth, the lack of availability of reusable alternatives in hospitality establishments in Copenhagen appears to be a reason consumers have not fully switched to alternatives yet. Even though most of the respondents and participants stated they prefer reusable tableware, it seems that often these are not available. Theme 4 'The route to follow' elaborates further on the types of alternatives available.

Finally, and contrasting the findings above, convenience is considered a key element for many consumers. Many participants mentioned they owned reusable tableware, but as seen during the observations, hardly anyone was seen bringing their own tableware (OBS). Additionally, convenience was the main factor for preferring SUPs in fast-food restaurants. The food has to be fast and easy to take away in case it is not finished. The following section will elaborate on the implications of this type of behaviour.

3.2 Fast Food Friction

Fast-food has become a prominent sight within Copenhagen. From large burger chains to small kebab shops to food trucks, fast-food is everywhere. It is no surprise that business is booming for these establishments in Western countries as they are dominated by fast-paced environments, where unhealthy food options are often cheaper than the healthy ones, and convenience and comfort are highly valued[22] [23]. Our findings reflect this, since the main motivations for visiting fast food restaurants were quick food service and ending a night out. This suggests that quality service is not a high criterion for consumption of fast-food, in contrast to other establishments such as cafes and bars/pubs (Figure 7). Interestingly, we found that some consumers (mainly tourists) did ask for a take-away cup in these establishments, even when they planned to consume on-site, "*No, I don't want the ceramic cup. Please, give me the other cup (non-reusable) just in case I don't finish it here*." (OCC-1.2).

Situations like this occurred even more frequently in fast-food restaurants. As can be seen in Figure 8, people visiting fast-food restaurants in Copenhagen often preferred to take-away their meal. Although take-away does not fall within the scope of our research, our findings suggest nonetheless that it is hard for businesses to separate take-away and on-site consumption. This results in establishments with a large take-away clientele using much more SUPs for on-site consumption. In fact, fast-food chains appear to be the greatest SUP users in Copenhagen (Figure 1). During the process of ordering, the customer has the choice to either take-away the food or to consume it on-site. However, often there is no distinction in tableware that is provided for both options (OBS). Therefore, the takeaway overlap problem cannot be ignored but remains challenging to solve in this project. This correlates with our findings on consumers' preferences for tableware in fast-food restaurants. As can be seen in Figure 7, nearly half of the fast-food consumers either prefer SUPs or have no preference, because of easier usability and disposability. Moreover, they are faster, cheaper, cleaner, and more convenient, such that leftovers can be taken to-go. Still, some consumers said they never expect to get reusable tableware when they eat at fast food restaurants, so they do not question or ask for reusable items.

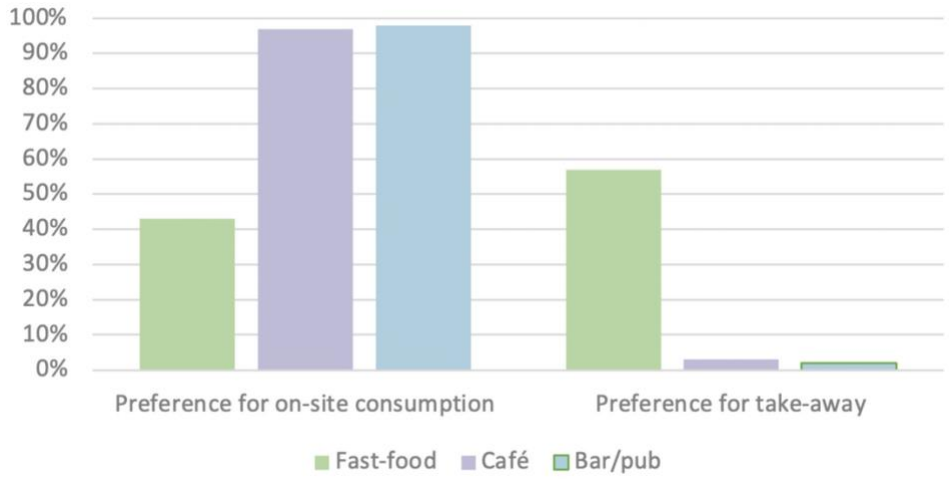


Figure 8: consumers' preference for on-site consumption vs. take-away in percentages for establishment categories in Copenhagen.

What stands out in our findings is that most respondents and participants are aware of the negative environmental impact of SUP usage. However, when people visit a fast-food restaurant, these values seem to quickly disappear. Although, our research suggests that slightly over half of the respondents prefer reusable tableware in fast-food restaurants; motivated by sustainability, aesthetics, eating experience (mouthfeel), less waste and higher quality. In contrast, the other half actually prefer disposables, or they do not care. Here hygiene, convenience and time savings are valued more than personal comfort, the environment and sustainability values.

Overall, these findings suggest that visiting fast-food restaurants mainly entails fast pace and convenience. Therefore, the use of tableware is of lesser importance, yet many consumers still indicate that they prefer reusable items. One consumer mentioned, "*I feel like I would prefer reusable items, but the industry seems to have normalized throwaway packaging*" (CS). This suggests that many would still like to switch to reusables, but that it is not possible due to the provision in fast food establishments. Thus, maybe a change should come from all establishments, to create an environmentally friendly and high quality experience.

3.3 Consumers and business owners coming together

The gap between what is currently available and what is desired raises the question of who should take the lead in the shift towards a SUP-free hospitality sector. Both business owners and consumers believe the other is to act first. On the one hand, business owners argue that they must cater to consumer demand and thus must uphold the current SUP system in place. On the other hand, consumers are inclined to use reusable alternative despite the existing barriers that they mentioned. This highlights that the consumers' perspective is not what business owners think it is. For instance, business owners think that consumers do not find reusable tableware to meet the health and safety standards. However, in reality, most consumers prefer traditional tableware. Essentially, consumers mainly choose a restaurant because of the taste and the ambience that the place transmits, rather than the type of cutlery that the establishment uses. The only establishment where consumers do not expect to receive traditional tableware is in fast-food restaurants, mainly out of convenience.

CHAPTER 4 | The route to follow

We know what both consumers and business owners want, namely a reusable alternative system. The current reliance on single-use tableware is generally disliked because of the negative environmental impact. When also considering economic factors, the best type of reusable tableware remains unknown. The following section addresses this question through a multi-criteria analysis (MCA) of a selection of alternative materials. Ceramic cups are the most preferable option to substitute SUPs. However, to further stimulate the change towards reusables, we elaborate on various inspirational best practices from both in and outside Copenhagen.

4.1 Options on alternatives

Currently, there are exist different material alternatives that can substitute SUP for on-site consumption. We compared them against each other and against SUPs, based on a list of economic, environmental and social criteria, also called a MCA (see Table 2). The MCA weighs different types of cups as these are one of the most used single-use items for on-site consumption in Copenhagen (see Annex III Table 10). We compare a single-use cup to three reusable alternatives against

criteria with specific weights assigned by stakeholders (see Annex III Table 13). For the alternatives, we selected a ceramic cup, a reusable plastic cup with a lid, and a reusable bioplastic cup with a lid. The best-case scenario implies that cups are reused more times and thus have greater longevity than in the worst-case scenario (see Annex III Table 14). According to the stakeholders in Copenhagen, and relating to their influence, the most important criterion is the 'global warming potential' and the least important one is the 'business-owner experience' (see Table 2). 'Global warming potential' relates to the carbon emissions over the lifetime of the cups, while 'business owner experience' to the attitude of the business owners towards the cups.

Table 2. *Best-case scenario for Multi Criteria Analysis*

			Type of tableware			
Weighing criteria		**Weights**	Paper cup with plastic lid	Ceramic cup (1000 uses)	Reusable plastic cup with lid (500 uses)	Reusable bioplastic cup with lid
Economic	Investment costs	0,54	100	25	75	0
	Operating cost	0,52	0	100	100	100
	Immediacy	0,49	100	100	100	50
Environmental	Global Warming Potential	0,73	1,6	100	18,6	No comparable data
	Durability	0,67	0,1	100	50	No comparable data
	Water consumption	0,56	0,4	100	20	No comparable data
Social	Consumer experience	0,54	45,3	100	43,4	82,8
	BO experience	0,43	25	100	25	25
Total Score			140	409	235	

The results indicate that the ceramic cup scores the highest in all criteria, except for the investment costs that need to be paid at the beginning. Thus, MCA findings indicate that the ceramic cup is the best overall cup, followed by the reusable plastic cup with lid with total scores of 409 and 235 respectively (see Table 2). The ceramic cup scores highest on the environmental and social criteria, meaning it is the most environmentally friendly option and both business owners and consumers like to use this cup. The reusable cup scores highest on economic criteria but has lower scores for both the environmental and social criteria. Furthermore, the worst-case scenario (see Annex III Table 14) shows that the number of reuses does not influence the results, but the score of the reusable plastic cup does increase. So, ceramic cups are the best option, even if it breaks after 50 times.

However, ceramic tableware is not the best option for establishments that do not have the necessary financial resources to invest at the opening stages. Moreover, the investment costs for bioplastics are also high as these materials are currently in development and the availability in the market is rather limited compared to the other options. Still, paying a high investment cost at the beginning for a ceramic cup will pay off in the long run. For example, if business owners are concerned about the environment, the best option is to opt for a ceramic cup. This is in accordance with the existing opinion of business owners that currently use traditional tableware, including ceramic cups (see Theme 2.1). Hence, the most preferred option for cafes and restaurants in Copenhagen is the ceramic cup and the least preferred option is the single-use cup.

4.2 Best practices

To complement the previous discussion of options on alternative tableware, we will discuss some best practice examples. Best practices can be used as a lesson for every stakeholder in making decisions regarding SUPs. In this section, we will discuss the EU countries that have or will implement the ban on SUPs. Specifically, Greece as one of the first EU countries

to ban SUPs is taken as an example for best practice. By taking the example of best practices countries, it is hoped that policy makers in Denmark can learn and be inspired to do the same. Besides that, several initiatives from various stakeholders that provide reusable systems will be explored. Changes do not only come from policy makers but also from initiatives or innovations carried out in several places. Lastly, some examples in Copenhagen that we obtained during data collection are presented.

4.2.1 Implementation of SUPs ban in Greece

The European Union (EU) Single-Use Plastics (SUPs) Directive aims to reduce environmental pollution by reducing plastic products, especially SUPs. [24] [25] The EU member states needed to convert the SUP Directive into national law and implement it before July 2021, but showed varying degrees of ambition, resulting in different targets and implementation dates. More ambitious countries are France, Ireland and Greece. The French government has issued a ban on single-use plastics. However, when it refers to paper cups lined with plastics, this will only be implemented from 2023.[26] The Irish government's latte levy will be introduced in 2022, to encourage a reduction in the use of the to-go coffee cups.[27] In Greece, the EU Directive has been transposed with additional targets under Law 4736/2020 and has been implemented since July 2021. The law targets the banning of select SUP items, an environmental fee of four cents per cup that must be paid by consumers when buying beverages or food in disposable plastic packaging. The Greek government has also set targets to reduce SUPs of 30% (2024) and 60% (2026) respectively.[28] Besides that, business owners are also required to provide consumers with reusable packaging and give discounts for consumers who bring their own reusable tableware.[6] [29]

As the Greek government showed the highest ambitions, we will look at the effects in more detail. In the Greek island of Paros, the EU and the national policy come together in a clever and ambitious initiative from Common Seas to create a plastic-free island in the future.[30] As a tourist destination, their initiatives focus on supporting the hospitality sector in reducing their dependency on SUPs.[30] They have partnered with 110 local businesses to provide them with information on the new plastic laws, knowledge on their plastic footprint, a roadmap to reduce their plastic consumption and incentives to do so. An example of an incentive is a discount to access alternative reusable products.[31] Considering the post-COVID recovery, they provided the hospitality sector with a guide on how to continue using reusable alternatives while taking hygiene into account. [32] This is an important measure as due to COVID many customers and cafes in Copenhagen have stopped using reusable cups because of hygiene factors. In addition, their recommendations include a focus on using reusable cups either by selling and giving them to customers for a deposit or by applying a discount to the customers that bring their own reusable cups. Another initiative is encouraging the use of tap water instead of plastic water bottles for on-site consumption. The businesses that join the initiative must adhere to a couple of minimal targets, such as not using plastic or biodegradable straws, bags or reducing their plastic cup and takeaway container use.[33] These are initial basic measures, but the 2021 Common Seas report states that many businesses are committing to broader targets. While the reported impacts of these initiatives are not yet fully consolidated, the Common Seas report illustrates how one café already avoided 200.000 water bottles in a year. This initiative carried out in Paros Island is a good example of how a policy can be the base for encouragement of reusables and system change to tackle the SUP problem.

4.2.2 Reusable systems seem to be a proven solution

In addition to the political measures, the business model of sharing reusable cups emerged a few years ago. This business model is maturing and has a complete system of operation. By combining it with other measures, it can stimulate consumers to use alternatives. A study found that having fees on single-use plastics in combination with the provision of alternatives can increase the use of reusable cups substantially in the long term.[34] In a three-month experiment at Starbucks in London (Figure 9), reusable cup usage increased from 2.2% to 5.8% when reusable cup discounts were offered and the cost of SUPs was increased; similarly, the manager of a sandwich chain observed 10 times increase in usage after they offered discounts on reusable cups.[35] Similar measures have been successfully implemented in Germany, like the RECUP start-up. RECUP has created a deposit refund scheme (DRS) for cups used by almost 3,000 vendors in over 450 cities in Germany.[36] When a customer uses a RECUP, they pay a deposit of 1 euro and then they can use it as much as they want. The customer can return the cup and get the deposit back in any store where the RECUP is being used. RECUP is available for both on-site and takeaway contexts, allowing the customers and business owners extra flexibility.

Figure 9: comparison of reusable cup and SUPs cup. [35] [37]

As mentioned in the first chapter, Kleen hub is a provider of a reusable system that is similar to RECUP. However, since this is a new initiative, it is not as widespread as in Germany. In the interview with Kleen hub (ALT-1), we learned that cafes are their main location of use. During the implementation, they found that mothers and college students are more open to using Kleen hub. In three of our interviews with business owners, Kleen hub was also mentioned (C2.2, C3.1, C4.1). Based on the interviews, one person thought this return mechanism was still inconvenient for customers while the others thought it was a good program. In addition, one of the NGOs stated that "*also important is the political support in order to make a system where you can have return stations in the city, otherwise, I don't think it's gonna work.*" (NGO-2). This confirms the importance of government support in the form of policies or promotions that can facilitate the banning of SUPs and the transition to a reusable system.

4.2.3 Best practice businesses in Copenhagen

Some cafes and fast-food restaurants in Copenhagen are taking extra steps to reduce SUPs. This section will give examples of the cafes and fast-food restaurants that not only already shifted to alternatives, but also willing to go the extra mile to make sure their business is sustainable.

One best practice is a cafe non-chain called Kaf. This is a vegan cafe in Norrebro, with its own sustainability and change manager. The cafe takes a step further by always looking at the most sustainable option for the products they use. Recently, they experimented with an edible cup with chocolate lining. Also, they implemented reusable cups and food containers from the company Kleen hub and reusable plastic cutlery for take-away. The café invested in the cutlery themselves and they simply just asked if the costumers could bring the cutlery back (C-3.1). The next example of best practice is a fast-food non-chain called Gaza Grill. This is a kebab shop in Norrebro who recently transformed their whole business into 100% organic. They replaced their SUPs with single-use bio-based alternatives made from corn starch (FF-3.1). All three best practices take sustainability to a higher level by integrating it in their whole business model, which can be an inspiration for the rest of Copenhagen. Notably, no clear best practice fast-food or cafe chains were found, showing a window of opportunity.

4.2.4 Step by step

Other establishments in Copenhagen did not fully transform into no SUP on-site but showed good efforts to minimize SUPs. Two quick wins observed in Copenhagen are discussed in this section. The first one is to just ask consumers. The chain cafes that were able to reduce their SUPs did this by implementing a simple differentiation of their service. When ordering at the counter, employees ask the customer whether they will consume on-site or take-away to reduce their SUP use and promote the use of reusable tableware. When this is created as a business policy, the implementation of such a difference becomes more streamlined. Of course, this policy does not mean that all the customers that were consuming on-site had reusables since we observed that some still had a disposable cup when sitting in the cafe. It is important for businesses to continue offering the customer the flexibility that they require, while offering a simple choice at the counter that proves to be effective.

A second quick win is going for reusable instead of single-use non-plastic. Since the EU introduced policies that do not allow the use of single-use plastic straws,[25] many businesses switched to bioplastic (made from avocado seeds or sugar cane) or paper alternatives to the normal straws.[25] The problem with these straws is that they are still single-use disposable solutions. Another option for on-site consumption is to move towards reusable options, such as glass or metal straws. Business owners that were already using those reusable straws showed to be pleased with them, since they were easy to use and not a big impediment. When considering on-site consumption, implementing reusable straws contributes to lowering the amount of waste generated by one-time consumption of items.

4.3 Where to go from here

To conclude, alternative options and examples of best practices are an integral part in overcoming the problem of SUPs. We found ceramic cups to be the most preferable alternative option to substitute SUPs in on-site consumption, because ceramic cups have the best economic, environmental, and social values. Ceramic cups require a high investment cost but will last a long time. Besides that, there are many lessons to be learned from best practices. For example, Greece showed the most ambitious implementation of the EU SUP directive. The ambitious steps they took were supported by the successful Paros Island project. Additionally, system reuse providers can support resolving issues with or without SUPs bans. Finally, in Copenhagen, there are several establishments that can be an inspiration for other places to use alternative tableware. When these lessons are combined, we believe that policymakers and other influential stakeholders can solve the SUP problem in Copenhagen together.

Limitations

Throughout the process of data collection and processing, several limitations were identified. The first limitation concerns the time constraints throughout the duration of the entire project, which led to several shortcomings. In the first phase of the research, several data collection methods were set up, however, besides a small pilot test of 2 hours there was not enough time to properly trial these methods beforehand. With the large group size of 30 students, consequently not everybody was properly prepared for each type of method. This created a lack of consistency among interviews, but also among the observations and the MUT. This sometimes resulted in inadequate data needed for the analysis. For example, if the interviews had a thoroughly done pilot, the questions could have been rephrased and restructured to receive the most valuable data. Furthermore, within the consumer survey, questions about the importance and values of recycling practices of consumers were not included. These questions could have provided valuable information. In addition, in the survey it would have been more efficient if we had the specified frequency of visits to establishments. This would make our estimates more precise.

Besides that, the size and composition of the sample should be considered. Firstly, the sample size is limited due to the many different types of data collection methods. Much data was gathered, however, the number of interviews, MUTs and observations conducted per area could be criticized. Approximately, only two interviews and two observations were conducted per establishment type per area. Due to the unknown total number of venues in Copenhagen we had to make rough estimations based on less accurate methods. Similarly, the consumer observations were only conducted once per establishment. This has led to several time ranges being left out, where the amount of SUP usage and the coverage of the research population could vary. Besides that, a convenience sampling was used for the consumer survey, which caused most of the survey participants to be between 20 to 35 years old.

Moreover, several biases may have occurred. Multiple interviews were arranged via contacts received by Oceana, which might have biased the aggregated perspectives as those contacts were mostly negative about SUPs. Additionally, the same weighing question was asked in the survey as in the MUT, however the responses were contradictory. This could have been due to the ranking question being all the way at the end of the survey, possibly making the respondents more biased towards environmental focussed answers.

Other limitations included the possible language barrier. The consumer survey was available in several languages (Chinese, Danish, English, French, German, Spanish), however translation and/or interpretations could have differed slightly. Similarly, all interviews and MUTs were conducted in English, whereas the native language of the vast majority was Danish. This may have influenced the quality and content of the answers, leading to incorrect assumptions about the interviewees' prevailing ideas, arguments, and narratives. Finally, commuters between different districts in Copenhagen were not identified in the consumer survey, causing difficulty in comparing the survey responses per area.

Overall, several limitations were defined, however, this does not nullify the results found. It simply highlights that the results must be interpreted with caution and the mentioned limitations should be taken into consideration when formulating recommendations and taking action. Besides that, additional research could be conducted to improve the reliability of the data and to make the results less generalizing.

Conclusion & Recommendations

This research aims to provide recommendations to Oceana and other stakeholders to decrease on-site SUPs consumption in fast-food restaurants, cafes and bars/pubs in Copenhagen. To do so, we first answer the main research question by identifying social, legislative and economic barriers and enablers of SUPs consumption.

We present four key findings that have emerged from our analysis. First, we found that the fast-food chain is the biggest single-use plastic user in Copenhagen, with the plastic wraps as most used item. Second, the interactions and relations between different stakeholders have shaped a general lack of collective action towards the SUP issue. The ongoing dynamics between stakeholders are therefore characterized as 'the Waiting Game', where the responsibility to make positive changes bounces back and forth. Third, when looking closely from the business owners' and consumers' perspectives, reduction of SUPs usage is hindered by various barriers. For the business owners, there were some persistent beliefs that are embedded in their current workflow: that recycling (at least partly) condones SUP use, that SUPs are necessary for convenience and consumer demand, and that single use alternatives are environmentally friendly substitutes of SUPs. Meanwhile, consumers are inclined to use reusable alternatives due to a pleasant dining experience, the environment and aesthetics. However, hygiene, convenience and several misconceptions sometimes urge consumers to prefer single use materials. Lastly, from the Danish legislation side, the minimum requirements that are imposed on SUP use is a big barrier in the transition towards reusables, especially when compared to other EU countries. From our research, legislative and economic incentives to reduce SUPs (discount and additional fee on SUPs) can be found in the best practices from various EU countries.

Following from these barriers, enablers and best practices, we have formulated recommendations that can be found in Table 3. Each column has one of three different colours that indicate the link with the social (pink), economic (yellow) or legislative (blue) aspect.

Table 3, on the next page, shows how the results can be used to support argumentations for policymakers to implement the recommendations and how enablers can be facilitated to overcome current barriers.

1. An **educational campaign** with the slogan *'recycling is not the solution, reusing is'* could put emphasis on the different negative impacts of the recycling system. It would highlight that recycling does not equal reusing and that recycling still incorporates a negative environmental impact. When awareness increases about the differences and cost of reusing compared to recycling, consumers and business owners can be stimulated to choose reusables.

2. **Investing in research for innovative reusable alternatives** would approach the challenge of high investment costs and the take-away overlap. When feasible alternatives have been established on the market, SUPs would not have to be the norm for take-away and business owners are not inclined to make use of these for on-site consumption. Consequently, the general number of SUPs in food and beverage establishments would decrease.

3. As described in theme 4, best practices and **subsidies by the national government** can facilitate the transition towards reusable alternatives. The perceived high operation and investment costs of reusables could be tackled, and the long-term savings and overall benefits could be stressed.

4. Installing **shared infrastructure facilities** would address the safety and health concerns regarding reusable alternatives, as in this way the according standards will be ensured. Furthermore, the costs of such facilities would be shared between different stakeholders and the initial investment costs of reusable alternatives would be diminished.

5. **Connecting the stakeholders** is important and therefore we propose an annual event, hosted by the business association, where the goal is to promote new reusable initiatives. In this way stakeholders who are not members of a business association get the opportunity to share current obstacles and receive advice from others. Furthermore, consumers can articulate preferences and demands directly to BOs and policy makers to avoid miscommunication and conceptions.

6. For a **certification system**, we suggest taking inspiration from current certification systems such as: Ocean Friendly Restaurants, Plastic Free Restaurants and Plastic Free,[38] to target the misconceptions regarding the costs and differences between recycling (costs energy, transportation, and labour) and reusing. A certification system could also create a clear overview of SUP consumption to address specific barriers which needs to be overcome.

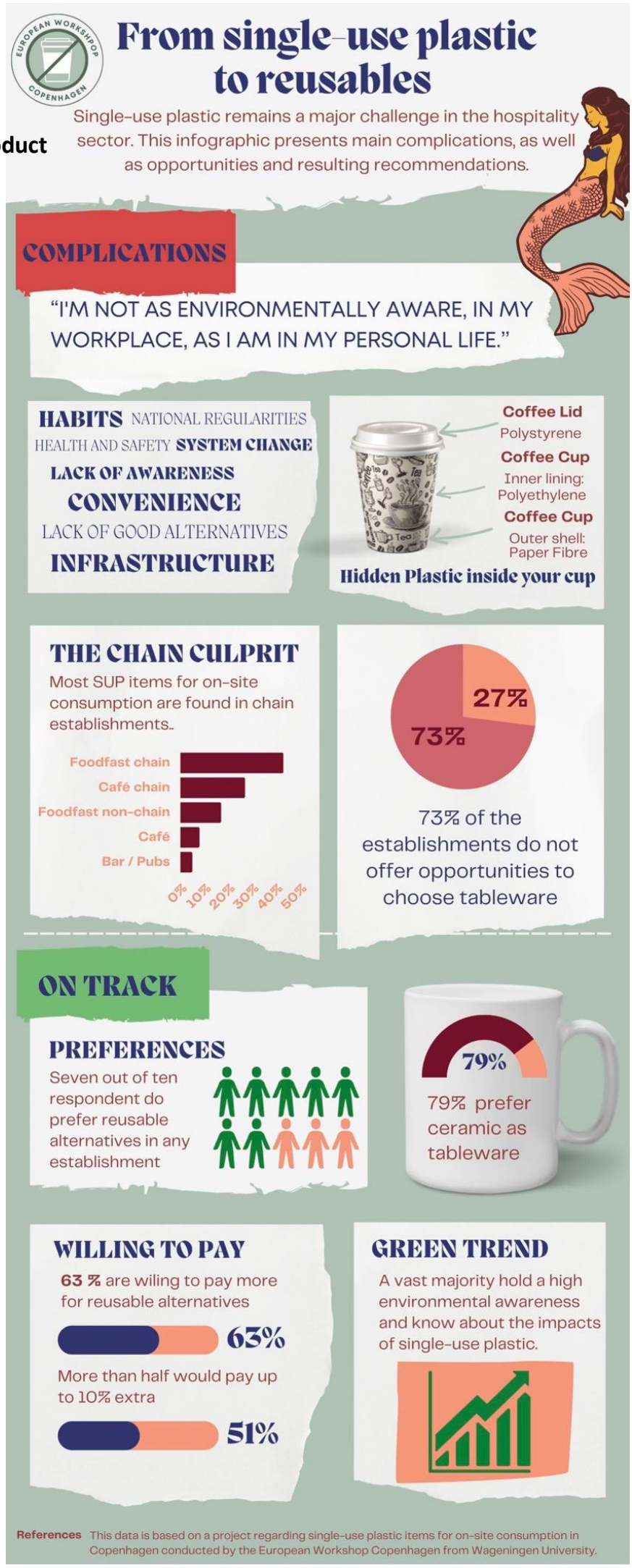
Investing in reusable alternatives, supporting new business models, creating shared infrastructure, and formulating a new guideline for hygienic use of alternatives are the keys in furthering the transition from single-use plastic to reusable tableware in fast-food restaurants, cafes and bars/pubs in Copenhagen.

Table 3. *Barriers and enablers of onsite SUPs consumption in Copenhagen and the recommendations*

Barriers	Enablers	Recommendations
Misconceptions about how waste management works regarding the costs of recycling and the difference with reusing.	BO already have the habit of reusing materials to prevent the costs of replacing them.	Increasing awareness about the trade-offs of recycling through educational advertisement targeting all stakeholders. *Recycling is not the solution, reusables are.*
Perceived high operation and investment costs of reusable alternatives by BO.	Consumers prefer reusables because it feels more familiar and provides a better experience.	Invest in research to new reusable alternatives to create economic feasible business models.
Take-away overlap: no clear distinction or option provided for the customer between on-site and take-away tableware.		
Convenience aspect from the BO in using SUPs.	Durability of reusables can compensate for the higher initial investment costs compared to SUPs.	Subsides from the national government to lower the investment cost of reusables.
		Shared infrastructure (e.g., washing facilities) for the use of alternatives by BO to lower operation costs.
Food safety and hygiene concerns from the BO perspective.	Business association promotes sustainability.	Create an annual event hosted by the business association to improve the cooperation between stakeholders.
The waiting game: *unclear division of responsibility between stakeholders regarding decreasing the use of SUPs.*	Negative connotation related to SUPs and a 'green image' associated with the use of reusables.	Implementing a certification system that shows the number of SUPs used in the business.

Annex

I. Outreach product



RECOMMENDATIONS

SHORT-TERM
<1 YEAR

STEP 1

CONNECT STAKEHOLDERS
create annual workshops hosted by business associations in which also non-members can take part in. This connects various stakeholders and supports knowledge and problem exchange.

STEP 2

INVESTMENTS INTO RESEARCH
Invest in research to create economic feasible business models and new reusable alternatives also for take-away. This reduces the on-site consumption likewise.

STEP 3

FINANCIAL SUPPORT
To facilitate the transition from single-use plastic to reusable alternatives provide financial subsidies from the national government.

LONGTERM
< 5 YEARS

RECYCLING IS NOT THE SOLUTION
Reuse instead of recycle. Increase awareness about the negative impacts and costs of recycling through educational advertisements.

STEP 4

SHARED FACILITIES
Create an infrastructure with shared facilities, such as washing facilities for the use of alternatives for business owners to lower operation and investment costs.

STEP 5

CERTIFICATION SYSTEM
Monitor the numbers of plastic on-site consumption and implement common standards for material selection. Market your business as plastic-free,

STEP 6

References This data is based on a project regarding single-use plastic items for on-site consumption in Copenhagen conducted by the European Workshop Copenhagen from Wageningen University.

II. Methodology details

Description of establishment categories

Classic: Local restaurant existing in the city, that are non-chain. Place in which you can sits, mostly, for on-site consumption, they have sits and Tables that enable this service. The meal served are breakfast, lunch and dinner.

Restaurant – Fast-food (non-chain e.g., kebab): A fast food restaurant serves fast food and has minimal Table service (often smaller) establishment. This includes shawarma/kebab places, fish & chip places, snack bar etc.

Restaurant – fast food chain: A fast food restaurant serves fast food and has minimal Table service. To be considered a chain you have a minimum of 4 locations. They are either under shared corporate, private ownership or franchising agreements. Typically, the fast-food restaurants within a chain have a similar architecture, standard menu and other services.

Cafe s – Normal: Primarily serves coffee of various types, sometimes also cold drinks, including iced coffee or tea. A cafe may also serve food, snacks, sandwiches, pastries, fruit or muffins.

Cafe s – Chain: Chain of cafe s with a similar menu at all locations. Primarily serving coffee of various types, sometimes also cold drinks, including iced coffee or tea. A cafe chain may also serve food like snacks, sandwiches, pastries, fruit or muffins. For instance, Starbucks; Bars/pubs: An establishment that serves alcohol without the requirement of ordering food.

**Traditional restaurants were purposefully left out since they do not use a substantial amount of SUPs for on-site consumption.*

List of SUPs

- Plastic wraps
- Plastic utensils
- Plastic straws
- Plastic sauce containers
- Plastic cups
- Plastic cup lids
- Plastic stirrers
- Plastic plates
- Plastic drink bottles
- Food boxes
- Ice cream plastic containers

Detailed method

Five main analyses were carried out to analyze the obtained data from the fieldwork. To reiterate, we had several components linked to these five analyses in the project in which work towards answering the research questions and achieve the overarching goal. First and foremost, we used the tallied-up SUPs number from each assigned district for comparing between the establishment categories in Copenhagen per year. Then, to investigate the biggest SUP user in Copenhagen, we compared the total SUPs observed in the 50 establishments of the five districts with the calculated SUPs pieces in all of Copenhagen per year. From this, information, we compared the values in each category and examined how much more SUPs comes from the biggest SUP user than the other categories. We did not do median, maximum or minimum values as they are not relevant to the purpose of this project.

Next, to gain a better understanding of business owners' perspectives on the use of SUPs in the hospitality sector in Copenhagen, an overview of a Table was made to do thematic and discourse analysis. Through, this we were able to recognize keywords which emerged into themes relating to attitude and perceptions on SUP usage, as

well as their body language during interviews. With this information from the Table, we quantified how many certain establishments use particular reusable tableware and draw meaningful insights from their justification. Simultaneously, we analyzed NGO, policymakers, alternative suppliers' perceptions on switching to reusable alternatives to gain a holistic view on the barriers and enablers related to SUPs. Thereby, we linked these aspects to the degree of influence they have on the SUP flow. Moreover, in understanding business owners' feelings and experiences to the usage of SUPs and alternative, we looked into the criteria that related to adopting reusables. For instance, we considered of investment costs and lifespan of certain tableware, as well as their view on the environment. This was done similarly with consumers, but we calculated the average preferences for tableware material in consumer interview and did cross checking with opinions expressed and habits from the surveys. With these considerations, we bridge into whether the criteria act as barriers or enablers. This helped to align and see the differences with the observations and stakeholder workshop.

Finally, in order to get an insight into the daily practices of consumers, quotes and statements from surveys and experiments were inspected to spot the possible similarities or paradox with the business owners.

III. CODEBOOK of interviews and observations

Table 4. *Codebook for interview*

Code	Description	Date	Geo area
NGO-1	Department of Public Affairs *Plastic Change*	7-06-22	Denmark (General)
NGO-2	Political advisor on circular economy *Danmark Naturfredningsforening*	03-06-22	Denmark (General)
GOV-1	Two representatives *Municipality of Copenhagen*	01-06-22	Copenhagen (General)
GOV-2	Employee in department of recycling and waste management Municipality of Frederiksberg	09-06-22	Frederiksberg (GEO 4)
BA-1	Head of Corporate Social Responsibility *The Host*	07-06-22	Copenhagen (General)
BA-2	Head of Environment *Horesta*	09-06-22	Denmark (General)
ALT-1	CEO *Kleen Hub*	07-06-22	Denmark (General)
FFC-6	Director Fast food chain	01-06-22	Copenhagen (General)
BAR-1.1	Bartender	31-05-22	City Center (GEO 1)

	Bar/pub		
BAR- 1.2	Bar manager Bar/pub	02-06-22	City Center (GEO 1)
CC-1.1	Store manager Café Chain	02-06-22	City Center (GEO 1)
CC-1.2	Dual position: Bar chief and coordinator of Green Collective group Café chain	07-06-22	City Center (GEO 1)
CCO-1.3	Consumer Observation	01-06-22	City Center (GEO 1)
C-1.1	Owner Café non-chain	07-06-22	City Center (GEO 1)
C-1.2	Owner Café non-chain	03-06-22	City Center (GEO 1)
FF-1.1	Employee Fast food non-chain	03-06-22	City Center (GEO 1)
FF-1.2	Owner Fast food non-chain	31-05-22	City Center (GEO 1)
FFC-1.1	Employee Fast food chain	31-05-22	City Center (GEO 1)
CC-2.1	Employee – waiter Café chain	01-06-22	Vesterbrø (GEO 2)
C-2.1	Manager Café chain	03-06-22	Vesterbrø (GEO 2)
C-2.2	Barista, administration, manager webshop, assistant with wholesale and marketing Café non-chain	31-05-22	Vesterbrø (GEO 2)
C-2.3	Barista Café non-chain	01-06-22	Vesterbrø (GEO 2)
C-2.4	Owner Café non-chain	01-06-22	Vesterbrø (GEO 2)

C-2.5	Manager Café non-chain	01-06-22	Vesterbrø (GEO 2)
C-2.6	Owner Café non-chain	02-06-22	Vesterbrø (GEO 2)
C-2.7	Owner Café non-chain	04-06-22	Vesterbrø (GEO 2)
C-2.8	Co-owner Café non-chain	06-06-22	Vesterbrø (GEO 2)
FFC-2.1	Manager Fast food chain	04-06-22	Vesterbrø (GEO 2)
FFC-2.2	Restaurant manager Fast food chain	04-06-22	Vesterbrø (GEO 2)
FF-2.1	Kitchen chef Fast food non-chain	01-06-22	Vesterbrø (GEO 2)
FF-2.2	Manager Fast food	31-05-22	Vesterbrø (GEO 2)
BAR-2.1	Full time employee in charge of many things Bar	31-05-22	Vesterbrø (GEO 2)
BAR-2.2	Manager Bar	06-06-22	Vesterbrø (GEO 2)
BAR-2.3	Floor manager Bar	07-06-22	Vesterbrø (GEO 2)
C-3.1	Manager Café non-chain	04-06-22	Nørrebro (GEO 3)
C-3.2	Owner Café non-chain	02-06-22	Nørrebro (GEO 3)
CC-3.1	Unit manager Café chain	01-06-22	Nørrebro (GEO 3)
CC-3.2	Sub-manager	06-06-22	Nørrebro (GEO 3)

	Café chain		
FF-3.1	Bar staff and restaurant chef Fast food non-chain	02-06-22	Nørrebro (GEO 3)
FF-3.2	Owner Fast food non-chain	31-05-22	Nørrebro (GEO 3)
FF-3.3	Employee Fast food non-chain	03-06-22	Nørrebro (GEO 3)
FFC-3.1	Manager Fast food chain	07-06-22	Nørrebro (GEO 3)
FFC-3.2	Employee Fast food chain	31-05-22	Nørrebro (GEO 3)
BAR-3.1	Manager Bar/pub	31-05-22	Nørrebro (GEO 3)
BAR-3.2	Owner Bar/pub	01-06-22	Nørrebro (GEO 3)
C- 4.1	Owner Café non chain	01-06-22	Frederiksberg (GEO 4)
C- 4.2	Worker Café non chain	03-06-22	Frederiksberg (GEO 4)
CC- 4.1	Manager Café chain	06-06-22	Frederiksberg (GEO 4)
CC- 4.2	Manager Café chain	06-06-22	Frederiksberg (GEO 4)
FF- 4.1	Manager Fast food non chain	02-06-22	Frederiksberg (GEO 4)
FF- 4.2	Manager Fast food non chain	02-06-22	Frederiksberg (GEO 4)
FFC- 4.1	Manager Fast food chain	03-06-22	Frederiksberg (GEO 4)

BAR- 4.1	Manager Bar	01-06-22	Frederiksberg (GEO 4)
BAR- 4.2	Worker Bar	02-06-22	Frederiksberg (GEO 4)
C-5.1	Owner Café non chain	01-06-22	Østerbro (GEO 5)
C-5.2	Head worker Café non chain	06-06-22	Østerbro (GEO 5)
FF-5.1	Manager Fast food non chain	06-06-22	Østerbro (GEO 5)
FF-5.2	Owner/manager Fast food non chain	01-06-22	Østerbro (GEO 5)
BAR-5.1	Head bartender Bar	06-06-22	Østerbro (GEO 5)
BAR-5.2	Owner/manager Bar	03-06-22	Østerbro (GEO 5)
FFC-5.1	Worker Fast food chain	04-06-22	Østerbro (GEO 5)
FFC-5.2	General manager of multiple venues Fast food chain	04-06-22	Østerbro (GEO 5)
CC-5.1	Owner/manager Café chain	06-06-22	Østerbro (GEO 5)
BOI	Business owner interview overall	-	Copenhagen (general)

Table 5. *Codebook for observations*

Code	Description	Date	Area
OBAR-1.1	Consumer observation Bar	6-1-2022	City Center (GEO 1)
OBAR-1.2	Consumer observation Bar	6-4-2022	City Center (GEO 1)
OCC-1.1	Consumer observation Café chain	6-2-2022	City Center (GEO 1)
OCC-1.2	Consumer observation Café chain	6-1-2022	City Center (GEO 1)
OC-1.1	Consumer observation Café non-chain	6-2-2022	City Center (GEO 1)
OC-1.2	Consumer observation Café non-chain	6-3-2022	City Center (GEO 1)
OFC-1.1	Consumer observation Fast-food chain	6-1-2022	City Center (GEO 1)
OFC-1.2	Consumer observation Fast-food chain	6-1-2022	City Center (GEO 1)
OFF-1.1	Consumer observation Fast-food non-chain	6-2-2022	City Center (GEO 1)
OFF-1.2	Consumer observation Fast-food non-chain	6-2-2022	City Center (GEO 1)
OBAR-2.1	Consumer observation Bar	4-6-2022	Vesterbrø (GEO 2)
OBAR-2.2	Consumer observation Bar	6-6-2022	Vesterbrø (GEO 2)
OC-2.1	Consumer observation Café non-chain	31-5-2022	Vesterbrø (GEO 2)
OC-2.2	Consumer observation Café non-chain	2-6-2022	Vesterbrø (GEO 2)
OC-2.3	Consumer observation Café non-chain	6-6-2022	Vesterbrø (GEO 2)
OCC-2.1	Consumer observation Café chain	31-5-2022	Vesterbrø (GEO 2)
OCC-2.2	Consumer observation Café chain	2-6-2022	Vesterbrø (GEO 2)
OCC-2.3	Consumer observation Café chain	31-5-2022	Vesterbrø (GEO 2)
OFC-2.1	Consumer observation Fast-food chain	2-6-2022	Vesterbrø (GEO 2)
OFC-2.2	Consumer observation Fast-food chain	4-6-2022	Vesterbrø (GEO 2)
OFF-2.1	Consumer observation Fast-food non-chain	4-6-2022	Vesterbrø (GEO 2)
OFF-2.2	Consumer observation Fast-food non-chain	4-6-2022	Vesterbrø (GEO 2)
OBAR-3.1	Consumer observation Bar	4-6-2022	Nørrebro (GEO 3)
OBAR-3.2	Consumer observation Bar	6-6-2022	Nørrebro (GEO 3)
OCC-3.1	Consumer observation Café chain	2-6-2022	Nørrebro (GEO 3)
OCC-3.2	Consumer observation Café chain	31-5-2022	Nørrebro (GEO 3)
OC-3.1	Consumer observation Café non-chain	31-5-2022	Nørrebro (GEO 3)
OC-3.2	Consumer observation Café non-chain	1-6-2022	Nørrebro (GEO 3)
OFC-3.1	Consumer observation Fast-food chain	1-6-2022	Nørrebro (GEO 3)
OFC-3.2	Consumer observation Fast-food chain	2-6-2022	Nørrebro (GEO 3)
OFF-3.1	Consumer observation Fast-food non-chain	2-6-2022	Nørrebro (GEO 3)
OFF-3.2	Consumer observation Fast-food non-chain	1-6-2022	Nørrebro (GEO 3)
OBAR-4.1	Consumer observation Bar	3-6-2022	Frederiksberg (GEO 4)

OC-4.1	Consumer observation Café non-chain	2-6-2022	Frederiksberg (GEO 4)
OC-4.1	Consumer observation Café non-chain	3-6-2022	Frederiksberg (GEO 4)
OCC-4.1	Consumer observation Café chain	3-6-2022	Frederiksberg (GEO 4)
OCC-4.2	Consumer observation Café chain	1-6-2022	Frederiksberg (GEO 4)
OCC-4.3	Consumer observation Café chain	4-6-2022	Frederiksberg (GEO 4)
OFC-4.1	Consumer observation Fast-food chain	1-6-2022	Frederiksberg (GEO 4)
OFC-4.1	Consumer observation Fast-food chain	4-6-2022	Frederiksberg (GEO 4)
OFF-4.1	Consumer observation Fast-food non-chain	2-6-2022	Frederiksberg (GEO 4)
OFF-4.2	Consumer observation Fast-food non-chain	6-6-2022	Frederiksberg (GEO 4)
OBAR-5.1	Consumer observation Bar	4-6-2022	Østerbro (GEO5)
OBAR-5.2	Consumer observation Bar	4-6-2022	Østerbro (GEO5)
OCC-5.1	Consumer observation Café chain	1-6-2022	Østerbro (GEO5)
OCC-5.2	Consumer observation Café chain	2-6-2022	Østerbro (GEO5)
OCC-5.3	Consumer observation Café chain	2-6-2022	Østerbro (GEO5)
OC-5.1	Consumer observation Café non-chain	2-6-2022	Østerbro (GEO5)
OC-5.2	Consumer observation Café non-chain	2-6-2022	Østerbro (GEO5)
OC-5.3	Consumer observation Café non-chain	2-6-2022	Østerbro (GEO5)
OFF-5.1	Consumer observation Fast-food chain	3-6-2022	Østerbro (GEO5)
OFC-5.1	Consumer observation Fast-food non-chain	3-6-2022	Østerbro (GEO5)
OBS-1	Consumer observations for GEO 1		City Center (GEO 1)
OBS-2	Consumer observations for GEO 2		Vesterbrø (GEO 2)
OBS-3	Consumer observations for GEO 3		Nørrebro (GEO 3)
OBS-4	Consumer observations for GEO 4		Frederiksberg (GEO 4)
OBS-5	Consumer observations for GEO 5		Østerbro (GEO5)
OBS	Consumer observations overall		Copenhagen (General)
SWGOV-1	Stakeholder workshop Participant municipality	6-9-2022	Copenhagen (General)
SWGOV-2	Stakeholder workshop Participant municipality	6-9-2022	Copenhagen (General)
SWGOV-3	Stakeholder workshop Participant municipality	6-9-2022	Copenhagen (General)
SWNGO-1	Stakeholder workshop Participant NGO	6-9-2022	Copenhagen (General)
SWNGO-2	Stakeholder workshop Participant NGO	6-9-2022	Copenhagen (General)
SWNGO-3	Stakeholder workshop Participant NGO	6-9-2022	Copenhagen (General)
SWNGO-4	Stakeholder workshop Participant	6-9-2022	Copenhagen (General)
SWBA-1	Stakeholder workshop Participant Business Association	6-9-2022	Copenhagen (General)

SWBO-1	Stakeholder workshop Participant business owner	6-9-2022	Copenhagen (General)
SWALT-1	Stakeholder workshop Participant alternative supplier	6-9-2022	Copenhagen (General)
SW	Stakeholder workshop Participants (overall)	6-9-2022	Copenhagen (General)
CS-1	Consumer survey Geo 1	-	City Center (GEO 1)
CS-2	Consumer survey Geo 2	-	Vesterbrø (GEO 2)
CS-3	Consumer survey Geo 3	-	Nørrebro (GEO 3)
CS-4	Consumer survey Geo 4	-	Frederiksberg (GEO 4)
CS-5	Consumer survey Geo 5	-	Østerbro (GEO5)
CS	Consumer survey overall		Copenhagen (general)
BS	Business owner survey	-	Copenhagen (general)
MUT-1	Material user test	6-1-2022	City Center (GEO 1)
MUT-2	Material user test	6-2-2022	Vesterbrø (GEO 2)
MUT-3	Material user test	6-3-2022	Nørrebro (GEO 3)
MUT-4	Material user test	6-4-2022	Frederiksberg (GEO 4)
MUT-5	Material user test	6-4-2022	Østerbro (GEO5)
MUT	Material user test	-	Copenhagen (general)
RTBO-1	Average ranking table business owners Geo 1	-	City Center (GEO 1)
RTBO-2	Average ranking table business owners Geo 2	-	Vesterbrø (GEO 2)
RTBO-3	Average ranking table business owners Geo 3	-	Nørrebro (GEO 3)
RTBO-4	Average ranking table business owners Geo 4	-	Frederiksberg (GEO 4)
RTBO-5	Average ranking table business owners Geo 5	-	Østerbro (GEO5)
RTBO	Average ranking table business owners overall	-	Copenhagen (general)

IV. Results and Calculations

- Material Flow Analysis

  The Calculation of average SUPs per capita

  Two samples were identified from each category to assess the general type of SUPs and also other typical SUPs that were found during observations. From these data, the average SUPs per capita per one on-site consumption can be determined using following equation:

$$\text{Average SUPs per capita} = \frac{\text{Number of SUPs observed}}{\text{Number of consumers observed}} \quad (1)$$

  The Calculation of total SUPs in Copenhagen

- Estimate the total on-site consumers in Copenhagen

Firstly, the number of populations[39] (www.citypopulation.de/en/denmark/copenhagen) and tourist per year[40] (www.worlddata.info/europe/denmark/tourism). The number of tourists has to be added to the total population of Copenhagen. To do so, we need to calculate how the population increases due to tourists every day.

Tourist can stay for a few days in Copenhagen so that is why we use number of nights spent by the tourist for the accommodation (e-unwto.org[41]) to estimate the average days spent by a tourist:

$$\text{Average days spent by a tourist} = \frac{\text{Night spent yearly in Copenhagen}}{\text{Number of tourist yearly in Copenhagen}} \quad (2)$$

$$\text{Average days spent by a touris} = \frac{11{,}406{,}805}{3{,}190{,}000} = 3{,}57$$

Secondly, the increase of population due to tourist daily was determined by following equation:

$$\text{Number of tourists visiting daily:}$$

$$= \frac{\text{Days spended by a tourist in a year x Number of tourist yearly in Copenhagen}}{365\ (days\ in\ a\ year)} \quad (3)$$

$$\text{Number of tourist visiting daily} = \frac{11{,}406{,}805}{365} = 31.248$$

Applying the result from the above calculation and ratio of tourists per area, the number of tourists per area can be determined as shown in Table 6.

Table 6. *Population and tourist distribution in the five districts in Copenhagen*

Area	Population	Tourist and visitors
City center	56,233	25,001
Vesterbro	77,283	1,041
Nørrebro	78,588	3,125
Fredriksberg	103,608	1,041
Osterbro	79,952	1,041
Total Copenhagen	395,664	31,248

- Estimate the total consumption of Single Use Plastic (SUP) on-site

Firstly, from surveys we found information about how frequent people visiting the Fast-food restaurant, Cafe and Bar (Table 7) since we consider that consumer usage on SUPs can be vary depends on how frequent people visit the establishment. Therefore, we quantify the surveys answer by assuming the number of visits per year; never = 0 visit, a few times per year = 10 visits, a few times per month = 96 visits, a few times per week = 192 visits and everyday = 365

visits. These assumptions can describe the percentage of people's frequency to visit each category as shown in Table below.

Table 7. *The frequency of consumers visiting different types of establishments in the five districts of Copenhagen (taken from the survey)*

Items	Never		A few times per year		a few times per month		A few times per week		Every day		total
Fast-food restaurant	6.93%	62	33.63%	301	47.37%	424	11.62%	104	0.45%	4	895
Café	2.01%	18	14.75%	132	53.41%	478	26.93%	241	2.91%	26	895
Bar	10.95%	98	19.55%	175	48.04%	430	19.78%	177	1.68%	15	895

The next step is calculating on how many SUPs are used in each category refer to the **Figure 2**. Since the category in the survey did not separate the chain and non-chain. We firstly average the average SUPs per capita of chain and non-chain and then apply in the below formula. The result was shown in **Table 8**.

$$\text{Days spended by a tourist in a year} = \frac{11{,}406{,}805}{3{,}190{,}000} = 3{,}57$$

Secondly, number of tourists were determined by following equation:

$$\text{Number of tourists} = \frac{\text{Days spended by a tourist in a year x Number of tourist yearly in Copenhagen}}{365\ (days\ in\ a\ year)}$$

- Estimate the total on-site consumers

SUPs per frequent catergory :

$$= \frac{\text{average SUPs}}{\text{Capita}}\ x\ \text{Total population in area x \% freq for each catergory x Assumption of frequency} \quad (4)$$

*1*Table 8. *The estimated number of SUPs in one of the districts of Copenhagen (Nørrebro, calculation based)*

0 times	10 times	96 times	192 times	365 times	Total
0	298,719	4,039,337	1,981,723	145,895	6,465,674
0	39,458	1,371,634	1,383,191	284,139	3,078,422
0	69,491	1,639,286	1,349,920	217,963	3,276,659

Finally, to reach the total SUPs per category, we sum up all frequent categories per area as shown in **Table 9**. Decomposing the chain and non-chain is achieved by multiplying the SUPs of fast-food restaurant and Cafe by the percentage of average SUPs per capita for each.

*2*Table 9. *The estimated number and the percentage of SUPs in five districts of Copenhagen*

	City Center	Vesterbro	Nørrebro	Fredriksberg	Østerbro	Total	
Fast-food chain	2,170,112	7,216,355	4,560,117	5,478,141	15,253,449	34,678,175	36%
Fast-fast non chain	443,483	5,067,813	1,905,557	3,332,663	2,760,607	13,510,124	14%
Cafe chain	1,746,359	8,242,679	1,824,665	11,709,562	6,427,063	29,950,327	31%
Cafe non chain	1,583,293	0	1,253,757	2,721,155	673,851	6,232,056	7%
Bars/Pubs	660,741	2,926,275	3,276,659	4,511,868	0	11,375,543	12%
Total	6,603,989	23,453,123	12,820,755	27,753,389	25,114,969	95,746,225	100%

Table 10. *Total number of SUPs, categorised by type, observed in different establishment in Copenhagen*

Type of Single Use Plastics	Fast-food chain	Fast-food non-chain	**Café chain**	Café non-chain	**Bars/Pubs**
Plastic wraps	157	38	24	9	49
Utensils	14	15	2	1	10
Straws	2	12	1	2	40
Sauce containers	103	13	4	7	3
Cups	107	5	118	16	20
Cup lids	84	0	71	9	0
Stirrers	0	0	1	0	0
Plates	1	0	5	0	0
Drink bottles	31	18	14	0	7
Food boxes	66	0	0	0	0
Ice cream containers	16	0	0	0	0
Other (SUPs)	13	1	4	0	0

The estimated Material Flow Analysis (MFA)

Table 11. *The estimated number of Single-Use Plastic (SUP) in establishment and disposal*

Category	Recycled	General waste			Environment	Import
	(31.1% of import)	Incinerated (41.6% of import)	Landfilled (97% of 27.3% of import)	*Incinerated & Landfilled combined*	(3% of 27.3% of import)	
Fast food non-chain	4.201.648 (4,2 million)	5.620.211 (5,6 million)	3.577.616 (3,6 million)	*9.197.827 (9,2 million)*	110.648 (0,1 million)	13.510.124 (13,5 million)
Fast food chain	10.784.912 (10,8 million)	14.426.121 (14,4 million)	9.183.128 (9,2 million)	*23.609.248 (23,6 million)*	284.014 (0,3 million)	34.678.175 (34,7 million)
Bars/pubs	3.537.794 (3,6 million	4.732.226 (4,7 million)	3.012.358 (3,0 million)	*7.744.584 (7,7 million)*	93.166 (0,1 million)	11.375.543 (11,4 million)
Café non-chain	1.938.169 (1,9 million)	2.592.535 (2,6 million)	1.650.311 (1,6 million)	*4.242.846 (4,2 million)*	51.041 (0,1 million)	6.232.056 (6,2 million)
Café chain	9.314.552 (9,3 million)	12.459.336 (12,5 million)	7.931.146 (7,9 million)	*20.390.482 (20,4 million)*	245.293 (0,3 million)	29.950.327 (30 million)
Export	29.777.076 (29,8 Million)	39.830.430 (39,9 million)	23.354.558 (23,4 million)	-	784.162 (0,8 million)	**95.746.225 (95,7 million)**

The material flow Table shows where the single-use plastic items end up, either in recycled, incinerated, landfilled or in the environment. The imports of SUPs' number per establishment category is based on result in Table 9. Using both calculated imports and source from PlasticEurope, we estimated the total exports for the recycled, general waste and environment **(Table 11)** which is illustrated in **Figure 15.**

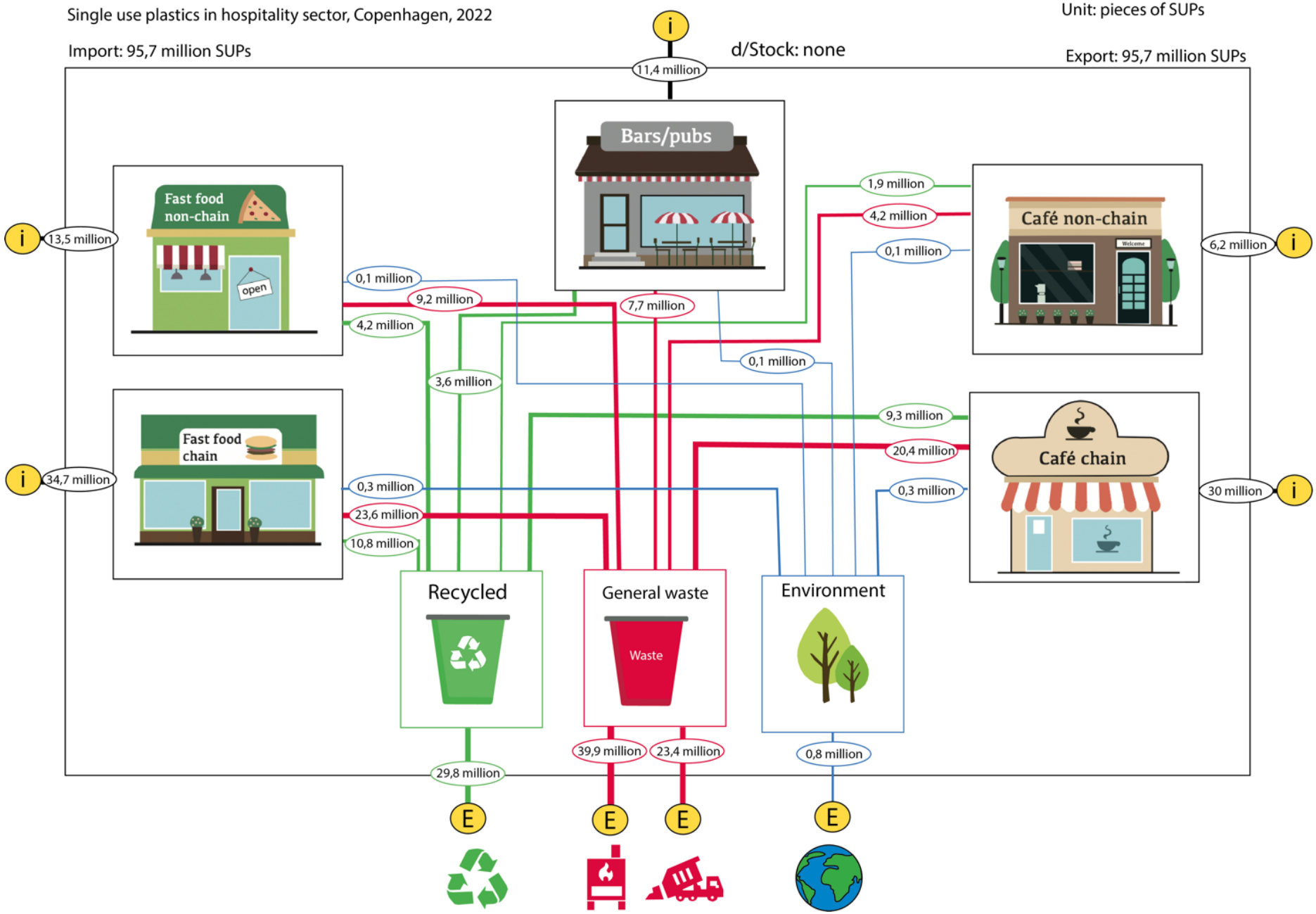


Figure 15: Material Flow Analysis (MFA) of Single-use Plastic (SUP) in Copenhagen

- Stakeholder Analysis

Table 12. *The rating score of interest and influence of different stakeholders in Copenhagen*

	GEO 1		GEO 2		GEO 3		GEO 4		GEO 5	
	Influence	Interest	Influence	Interest	Influence	Interest	Influence	Interest	Influence	Interest
Cafe chain	4	1	3.5	2	3.5	2	3.5	2	4	3.5
Cafe non-chain	4	1	2.5	3.5	1.5	3.5	2.5	2	3.5	3.5
Fast food non-chain	3.5	1	3.2	1.5	1.5	1.5	1.5	1.5	2.5	2
Fast food chain	4.5	1	4.5	1.5	4	2	4	2	4	2.2
Business Association	3.3	3	3.3	3	3.3	3	3.3	3	3.3	3
Bar	2	1	2.5	2.5	2.5	1.5	1.5	1.5	2.5	2.5
Consumer	3	1	3	3.7	2	4	3.5	2	4.5	4.5
Municipality	3.7	3.5	3.7	3.5	3.7	3.5	3	4	3.7	3.5
National Government	5	2.5	5	2.5	5	2.5	5	2.5	5	2.5
NGOs	3.2	4.7	3.2	4.7	3.2	4.7	3.2	4.7	3.2	4.7
EU Government	2.5	4.5	2.5	4.5	2.5	4.5	2.5	4.5	2.5	4.5

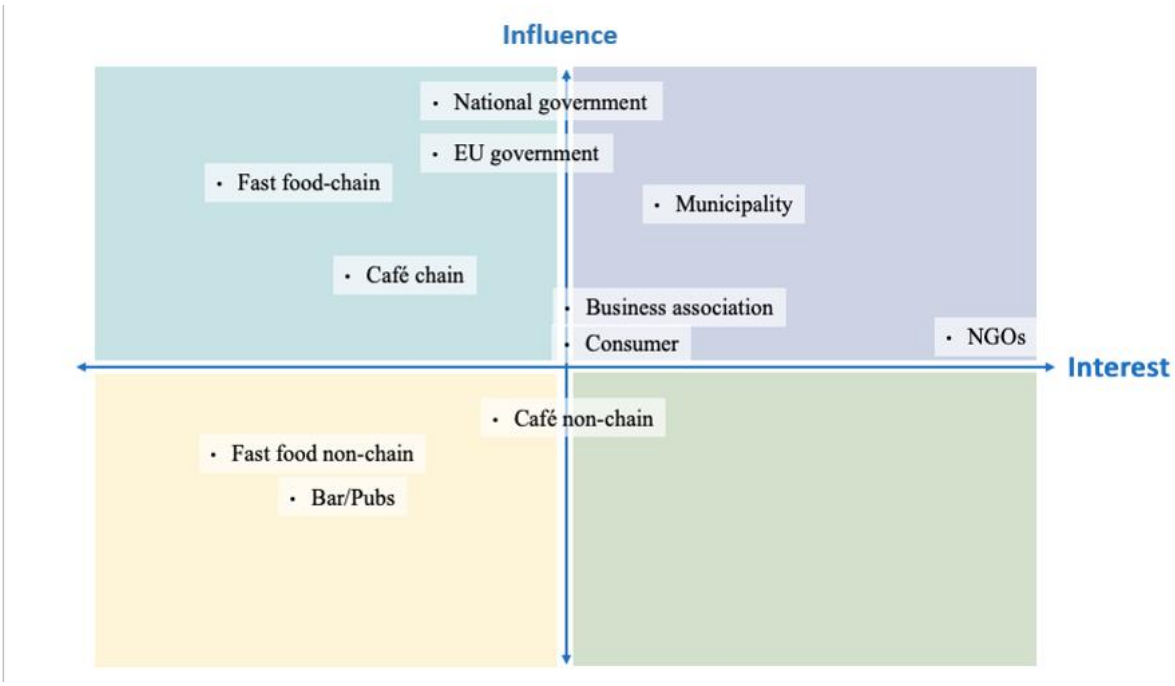


Figure 16: Stakeholder Matrix to highlight levels of interest and influence for the relevant actors.

In this stakeholder matrix, influence refers to the different stakeholders' views on banning the on-site consumption of SUPs in Copenhagen's fast food, cafe, and bar and switching from SUPs to the use of alternatives. Interest refers to the stakeholders' views on willingness to change the status quo of SUPs use in Copenhagen.

This matrix is based on the results of interviews, surveys and observations. After data analysis, the influence and interest were divided into five levels, and the influence or interest of stakeholders increased from level 1 to level 5. Different stakeholders were placed in different positions in the matrix to understand their relevant influence and interest, and to clarify the relationship between different stakeholders.

- Multicriteria analysis

Alternatives exploration

A multi-criteria analysis (MCA) is a decision-making tool for multi-criteria problems that include qualitative and quantitative aspects[42]. In the scope of this project, we used MCA to compare and rank a SUP cup and reusable alternatives in order to find the most preferred option for cafes and restaurants in Copenhagen. The identified alternatives to paper cups with plastic lids were ceramic cups, reusable plastic cups and reusable bioplastic cups. All options were compared against three economic, three environmental and two social criteria.

Scoring

We gave each type of cup a score for every criterion, based on our interviews, test and literature research. Depending on the criterion and data availability, we used a quantitative or qualitative method. The resulted performance matrix with the scores, units and sources can be seen in Table 13. Then, we calculated the overall scores by making the highest score per criterion equal to 100 and transforming the other scores for that criterion accordingly.

Table 13. *Performance matrix*

			Score				
Criteria	**Details**	**Unit**	**Paper cup with plastic lid**	**Ceramic cup**	**Reusable plastic cup**	**Bio-based plastic cup**	**Source**
Investments costs	Implementation costs for the reusable material alternative	-- (very low) / ++ (very high)	--	+	-	++	BOI and journal article[xxxvii]
Operating costs	Yearly costs to maintain the reuse system for business-owners	-- (very low) / ++ (very high)	+	-	-	-	BOI
Immediacy	Is the material readily available on the market, is it legal	Yes/no	Yes	Yes	Yes	No	BOI
Global Warming Potential	How much better/worse in terms of carbon emissions over lifetime in comparison to single-use	Amount of reuses / environmental payback period (years)	1	62,5 (1000/16)	11,6 (500/43)	No data	Journal article[xxxviii]
Durability	Lifetime	Amount of reuses	1	1000	500	500	Report[xxxix] and author's assumption
Water consumption	How much better/worse in terms of water consumption over lifetime in comparison to single-use	Amount of reuses / environmental payback period (years)	1	250 (1000/4)	100 (1000/10)	No data	Journal article[35]
Consumer experience	Overall experience of person using alternative	1 (least preferred) / 4 (most preferred)	3,3	1,3	3,4	1,9	MUT
BO experience	Overall experience of person using alternative	(very bad) --/++ (very good)	-	++	-	-	BOI

Relative weighting

In order to account for the relative importance of each criterion, we gave each criterion a specific weighting using the rank sum method. This method ranks each criterion by order of preference, where number 1 is the most preferred. The ranking was based on the ranking Table filled out by different stakeholders. For consumers, the final ranking is an average of all surveys. For business owners, average ranking was calculated for each business owner category (CC, CCN, FF, FFC, B/P). The average ranking for municipality, NGOs, and business associations were calculated separately.

The relative weightings for each criterion per stakeholder category (wr) were calculated with the following formula:

$$wr_i = \frac{K - r_i + 1}{\sum_{j=i}^{K} K - r_j + 1} \quad (4)$$

Where

- R_i is the rank of the *i*th objective
- K is the total number of objectives

Influence factor

The mentioned stakeholders differ in power to replace SUPs. Therefore, an influence factor was applied to derive a total weighting. The influence factor is based on the stakeholder analysis (see appendix X).

The total weight (wt) per criterion was calculated with the following formula:

$$wt_i = \frac{\sum (F_j wr_{ij})}{\sum F_j} \quad (5)$$

Where

- f_j is influence factor for stakeholder category j
- wr_{ij} is relative weighting from stakeholder category j for criterion i

Overall preference score

The total score for each option was calculated with the following formula:

$$S_i = w_1 s_{i2} + w_2 s_{i2} + \cdots . w_n s_{in} = \Sigma w_j si_j \quad (6)$$

Where

- w_j = weight for criterion j
- s_{ij} = score for option i on criterion j
- n = amount of criteria taken into account

Worst-case scenario

In order to show the influence of the amount of reuses assumption, a worst-case scenario MCA Table was made where ceramic cups and reusable cups were assumed to be reused 50 times.

Table 14: Worst-case scenario for Multi Criteria Analysis (MCA)

Weighing criteria		Weights	Type of tableware			
			Paper cup with plastic lid	Ceramic cup (50 uses)	Reusable plastic cup with lid (50 uses)	Reusable bioplastic cup with lid
Economic	Investment costs	0,54	100	25	75	0
	Operating cost	0,52	0	100	100	100
	Immediacy	0,49	100	100	100	50
Environmental	Global Warming Potential	0,73	32	100	37,2	no data
	Durability	0,67	2	100	100	no data
	Water consumption	0,56	8	100	40	no data
Social	Consumer experience	0,54	45,3	100	43,4	82,8
	BO experience	0,43	25	100	25	25
		Total Score	168	409	293	

V. Data collection methods guidelines

Name:
Organization/company:
Date:

If all cafe s and restaurants in Copenhagen would replace single-use-plastics with reusable cups and plates (e.g.: wood, ceramic, reusable plastic), which of the following criteria would be most important to consider when choosing the reusable alternative?

Please rate them from 1 to 11, where 1 is the most important and 11 the least important.

Table 15. *Ranking of different criteria to select in alternative options to Single-use plastic (SUP)s*

	Low investment costs for the businesses
	Short time before investment is recovered
	Low operating costs for the businesses to maintain the reusable alternative
	Low costs for the customers
	How fast the alternative can be introduced in the market
	Less CO2 emissions over the lifetime of the reusable alternative
	Durability of the reusable alternative
	Less water needed to manufacture and re-use the alternative
	Look & feel of the reusable alternative for consumers
	Business-owner experience when using the reusable alternative
	Low health risks perception of the reusable alternative

Table 16A. *Consumer Observation guidelines*

Date:	**Time:**			**District:**
Name of Restaurant/cafe :				**Restaurant or cafe ? (circle)** **Restaurant chain/restaurant non-chain** **Cafe chain/Cafe non-chain** **Bar/Pubs**
Number of chairs: Inside: Outside:				
Aspect	**Question**	**Yes**	**No**	**Remark**
Ordering	Possible to use own tableware			
	The sups are given at [counter (Yes)/Table (No)]			
		Number		
	Ask for reusable tableware			
	Takes own reusable tableware			
Consuming	Alone			
	Group			
Disposal	Leave tableware on Table			
	Throw randomly in trash bin			
	Try to find recycling bin			
	Take sups away			
Infrastructure	Trash bins			
	Recycling bins			

Observe the following aspects:

- People activities: (reading, writing, studying/working, talking in groups, laughing, having a meeting, etc.)
- Type of items they are using: (reusable plastic, SUPs, ceramic, // plates, utensils, cup, etc.)
- How the place looks like: (capacity, number of Tables and chairs, how the disposals look like, spaces to interact with others, specific items related to tableware or SUPs, etc)

Table 16B. *Single-use plastic item observation guidelines*

No.	Type of SUPs on-site	Checklist (Available or not)	Amount (pcs)	Per number of customers observed
1	Plastic wraps			
2	Utensils			
3	Straws			
4	Sauce containers			
5	Cups			
6	Cup lids			
7	Stirrers			
8	Plates			
	(Other SUPs)			

Table 17. *Business Owner Observation guidelines*

Place (region): **Date:** **Time:**	**Name of Restaurant/cafe :** **Restaurant or cafe ?** **R: fast food chain, fast food non-chain,** **C: Cafe chain, Cafe non-chain** **Pubs/Bars**

General observation				
Aspect	**Question**	**Yes**	**No**	**Remark**
Visual materials indicating sustainability – Visible from the outside	Signs/posters visible from the outside			
Visual materials indicating sustainability – Visible from inside	Signs/posters in establishment			
	Visibility re-usable tableware			
	Visibility SUPs tableware			

Observation during interview with the businessowners	
Aspect & examples	**Remark**
Body language - Position of the arms & legs - Copying your body language - Posture tells the story - Hand signals - Ornaments (clothes, jewellery) - Head movement	
Tone of speech - Happy - Mad - Worried	

- Surprised - Sad - Loud talking	
Facial expressions - Emotions - Eye gaze - Eyebrows - Clenched jaw - Smile	

Consumer survey - Copenhagen consumers:

Dear participant,

Firstly, thank you for participating in this survey by Wageningen University and Research (WUR), The Netherlands. This survey is designed to get more information about the consumers' behaviour and attitude toward single-use plastics in fast-food restaurants, cafe s and bars.

The survey is anonymous, and your answers will be treated carefully; the answers will only be used for our research.

Participating in this survey will take around 5 minutes of your time. By continuing, you confirm that you have read the above information and agree to participate in this study. You can still leave at any time during the survey.

For comments or questions, you can contact us via e-mail: edithmarcela.ariasvillalobos@wur.nl

Kind Regards,
WUR master students

When answering the questions in this survey, please consider on-site consumption only and do not think about take-away.

Q1. What gender do you identify with the most?

- o Female
- o Male
- o Non-binary
- o Other:

Q2. Age (in numbers) _____

Q3. Where do you live?

- o I live in Copenhagen
- o I work/study in Copenhagen but I live elsewhere
- o I live elsewhere in Denmark
- o I live abroad / I'm a tourist
- o Other:

Q4. What is your current occupation?

- o Student
- o Working
- o Unemployed
- o Retired
- o Other:

Q5. How often do you usually visit the following places?

	Never (1)	A few times per year (2)	A few times per month (3)	A few times per week (4)	Every day (5)
Fast-food restaurant (1)					
Cafe (2)					
Bar (3)					

Q6. What are the main reasons you visit a fast-food restaurant? (Multiple answers possible)

- o Just to eat or drink something
- o To study
- o To work
- o To spend free time
- o To socialize
- o Other:

Q7. What are the main reasons you visit a cafe ? (Multiple answers possible)

- o Just to eat or drink something
- o To study
- o To work
- o To spend free time
- o To socialize
- o Other:

Q8. What are the main reasons you visit a bar? (Multiple answers possible)

- o Just to eat or drink something
- o To study
- o To work
- o To spend free time
- o Socialize
- o Other:

Q9. With whom do you usually go to a fast-food restaurant? (Multiple answers possible)

- o By myself
- o Friends
- o Family
- o Date
- o Business meeting
- o Other:

Q10. With whom do you usually go to a cafe ? (Multiple answers possible)

- o By myself
- o Friends
- o Family Date
- o Business meeting
- o Other:

Q11. With whom do you usually go to a bar? (Multiple answers possible)

- o By myself
- o Friends

- o Family
- o Date
- o Business meeting
- o Other:

Q12. At what time do you usually go to a fast-food restaurant? (Multiple answers possible)

- o Breakfast
- o Lunch
- o Dinner
- o Snack
- o Other:

Q13. At what time do you usually go to a cafe ? (Multiple answers possible)

- o Morning
- o Midday
- o Afternoon
- o Evening
- o Night

Q14. At what time do you usually go to a bar? (Multiple answers possible)

- o Morning
- o Midday
- o Afternoon
- o Evening
- o Night

Q15. Do you own any alternative to single-use plastic tableware? (e.g., Reusable cups, thermos, bamboo straws)

- o No
- o If yes, which ones

Q16. What type of tableware do you prefer to receive food/drinks that you order in a fast-food restaurant?

- o Plastic and or paper/cardboard
- o Reusable items (glass, ceramic, bamboo, silverware)
- o I do not care

Why do you prefer this? _____

Q17. What type of tableware do you prefer to receive food/drinks that you order in a cafe ?

- o Plastic and or paper/cardboard
- o Reusable items (glass, ceramic, bamboo, silverware)
- o I do not care

Q18. What type of tableware do you prefer to receive food/drinks that you order in a bar?

- o Plastic and or paper/cardboard
- o reusable items (glass, ceramic, bamboo, silverware)
- o I do not care

Why do you prefer this? _____

Q19. Which of the following options do you prefer?

	I prefer to sit down and eat/drink my meal on-site (1)	I prefer to take-away my meal (2)
Fast-food restaurant (1)		
Cafe (2)		
Bar (3)		

Q20. How interested are you in using alternatives to single-use plastic?

- o Not interested at all
- o Slightly interested
- o Moderately interested
- o Very interested
- o Extremely interested

Q21. Do you prefer to go to a bar/cafe that allows you to use your own reusable tableware?

- o Yes, I intentionally go to this type of places
- o Yes, but I do not actively look for this type of places
- o No, I am indifferent

Q22. Would you use alternatives to single-use plastics influence your daily habits?

- o Yes
- o No
- o I do not care

Q23. Do you have any concerns about using single-use plastic?

- o No
- o If yes, which ones?

Q24. Do you have any concerns about using alternative tableware to single-use plastic?

- o No
- o If yes, which ones?

Q25. If an establishment were to implement reusable alternatives when you eat in a restaurant, how much more would you be willing to pay?

- o Nothing
- o Up to 10% more
- o Up to 20% more
- o Up to 30% more

Q26. Would you be more incentivized to bring your own reusable tableware if a discount is applied?

- o Yes
- o No

Why yes and why not? _____

Q27. If you have any questions or comments, please write them here _____

Q28. If all cafe s and restaurants in Copenhagen would replace single-use-plastics with reusable tableware (e.g., bamboo, ceramic, reusable plastic), which of the following criteria would be most important to consider when choosing the reusable alternative? Please rate them from 1 to 6, where 1 is the most important and 6 the least important.

_____ Economic benefit for the business (1)

_____ Economic benefit for the consumer (2)

_____ Environmental benefit (3)

_____ Convenience of use by business (4)

_____ The look and feel of the alternative (5)

_____ Alternative is ready to be used on a large scale (6)

Interview Questions – Business owners/ managers:

Time: 20-30 minutes

Explanation for conducting the interview: Please read this document carefully before conducting the interview. This will ensure that you know what you are going to ask your interviewee, in what order, and in which direction the conversation can be stirred.

Target group: Always aim for the manager (highest position), if this is not possible due to absence or other reasons [what then? Person below].

Structure: The interview consists of 17 questions. For some questions, a Table is added that provides: i) examples (probes), that can be used for directing the answer to relevant topics; and ii) address additional 'follow-up' questions that have less priority but can be used if time allows.

The interview is structured in a way that there are questions for all businesses (so either SUP users, shifters and shifted), and questions specific for shifters/ shifted businesses. The **definitions**:

Single-used plastic users	**Shifters/ shifted** *(same interview questions)*
Businesses that have single use plastic items AND no reusable alternatives.	Shifters: Businesses that are experimenting/using with reusable alternatives, may still use some types of single use plastics (though, not fully rely on single-use plastics) Shifted: Businesses that only have reusable alternatives, SO no use of single used plastics

NOTE! When conducting the BO interview, also do the BO observation

Etiquettes for recording:

- put the phone in the middle of the Table to show we are recording

- stop the recording if it is not relevant to interviews e.g., weather is nice

---

Introduction

Good day / hello [NAME],

We are a group of Master students from Wageningen University and Research. We are doing a project on tableware-usage related to food and beverage establishments, more specifically single-use plastic. This is a consultancy project for Oceana, an international non-governmental organization.

This interview will take approximately 25 minutes of your time. In addition, we ask for your permission to record this interview for transcribing purposes. If at any point you feel uneasy about answering questions, or would like us to stop the recording, please let us know.

Do you have any questions before we start?

START INTERVIEW*, ASK FOR CONSENT, *START THE RECORDING

Opening questions

- What is your position in the company? (Which of the following categories would be most applicable to describe your business?)
- What does your role entail?
- How long have you been working here?

TOPIC: single-use plastic

QUESTION 1:	What type of single-use plastic are you using for tableware items for on-site consumption?
Examples	Cups, plates, bowls, cutlery, straws, stirrers, etc.
Follow-up question	Do you use other disposables? e.g., Paper, aluminium, wooden cutlery

IF THE ANSWER IS NO SUPS ARE BEING USED, SKIP TO QUESTION 4

QUESTION 2:	Where are you getting your tableware single-use plastic supply from?

QUESTION 3:	What are your reasons for your choice of single-use plastic material?
Examples	And what about: • Economic cost (e.g., it's cheaper) • Environmental impact of SUPs (e.g., pollution) • Social (e.g., convenience, looks appealing) • Political (e.g., hygiene and safety standards)
Follow-up question	Would you mind elaborating on this? *(Such as convenience, for whom? Themselves? Customers?).*

TOPIC: **reusable** alternatives

(Definition: everything that is not a single-use plastic and can be reusable)

QUESTION 4:	Do you use reusable alternatives for your tableware items?
Follow-up question	If yes: which ones? If no: next question

QUESTION 5:	What are the problems you identified with switching to single use plastic (reusable) alternatives?
Follow-up question	a. *Economic cost:* what financial costs do you consider for switching to single-use plastic alternatives?

	b. *Infrastructure / Knowledge gap:* what single-use plastic alternatives are you aware of? Do you know of any accessible alternative options you could switch to? c. *Social:* have you experienced customers insisting on the use of single used plastics? d. Other?

QUESTION 6:	What advantages do you see (in the near future) to use reusable alternatives? And why?
Follow-up question	Name a few examples and ask for their opinion (to be defined)

QUESTION 7:	Are you connected to any associations or other restaurants? If so, which?
Example	Partners (association/restaurants) such as: Suppliers, restaurants in the neighbourhood, municipality, business association etc.
Follow-up question	o How does this help you? o Do you share information on alternatives? o How frequently are you in contact with those? o Which are the most important ones for your business?

**END OF THE INTERVIEW FOR ONLY SINGLE-USE PLASTIC BUSINESSES GO TO 'FINALIZING INTERVIEW'*

TOPIC: shifters and shifted

Now we would like to ask you a few questions about the switch from single use plastics to reusable alternatives.

QUESTION 8:	What did you take into consideration when looking for an alternative for the single use plastics for your business?
Examples	a. Economic (price) b. Environmental impacts c. Customers d. Other
Follow up question	If multiple reasons mentioned: was one of your mentioned reasons more important than the other?

QUESTION 9:	Could you tell us something about the initial investment cost that was necessary when switching to the reusable alternative? (*If don't know, add questions to follow up questions*)
Examples	a. High, medium or low investment for your business specifically b. Or more specifically: ▪ Cost of the reusable alternative ▪ Cost of adapting the business

QUESTION 10:	How long did it take for your business to recover the investment made? *(If they don't know, add questions to follow up questions)*
Examples	a. Ask for specific time frame, months, years.

QUESTION 11:	How much does it cost for your business to maintain the reusable system in a year? *(If they don't know, add questions to follow up question)*
Examples	a. It is a continuous investment b. Energy costs (water from washing machine, electricity, others)

QUESTION 12:	How long does one [reusable alternative: cup/plate/crockery etc.] last before you need to replace it or buy more of it?
Follow up question	What are the reasons for having to replace it?
Example	a. Buy more because customers take it home b. Breaks c. Becomes too dirty

QUESTION 13:	Does the consumer have to pay an extra amount for the reusable alternative?
Examples	a. Extra cost for the reusable b. Slight increase of overall prices of products c. Discount for bringing reusable
Follow up question	If yes: how much?

Topic: FINAZLING INTERVIEW

Now we would like to ask more questions about specific amounts which you might have to look up in the system.

QUESTION 14:	What is the total amount of single-use plastic items (on-site) per year? (Ask for each type of SUPs item)
Optional follow-up question	a. How much SUP items do you order per month/year? b. How much of those are used on-site (estimated percentage of total SUPs ordered)?

QUESTION 15:	What is the average use of single used plastics of one customer per visit?

If you do not know the amount of the top of your head, we would like you to fill in the questions via email. [QR code] this also include further questions about quantities related to SUPs.

TOPIC: Personal (individual) opinion

These were all questions related to (your role) the business, we are as well interested in your (personal) opinion on...

QUESTION 17:	Do you think the cafe /restaurant sector can become more sustainable in terms of single used plastic? And how?

Conclusion

Is there anything you want to say or add we have not discussed?

Thank you for your time and participation, we really appreciate it.

We would also appreciate it if you could fill in the follow up questions in the email that we will send, given your permission.

Here is our contact information if you would like to reach us for any additional questions. [Name xxx, phone number +31 xxx, email xxx]

- Do you have a recycling system of SUPs inside of restaurant or cafes?
- *Do you separate plastic waste from the Table (on-site) from the general waste? (To determine percentage recycled, going to general waste, or somewhere else)*
    - *If yes, what percentage of plastic waste do you separate?*
    - *How many bags of plastic waste do you have per day?*
    - *How many bags of general waste do you have per day?*

* Add follow up questions of 9, 10, 11 if they were not answered.

9. Could you tell us something about the initial investment cost that was necessary when switching to the reusable alternative?

10. How long did it take for your business to recover the investment made?

11. How much does it cost for your business to maintain the reusable system in a year?

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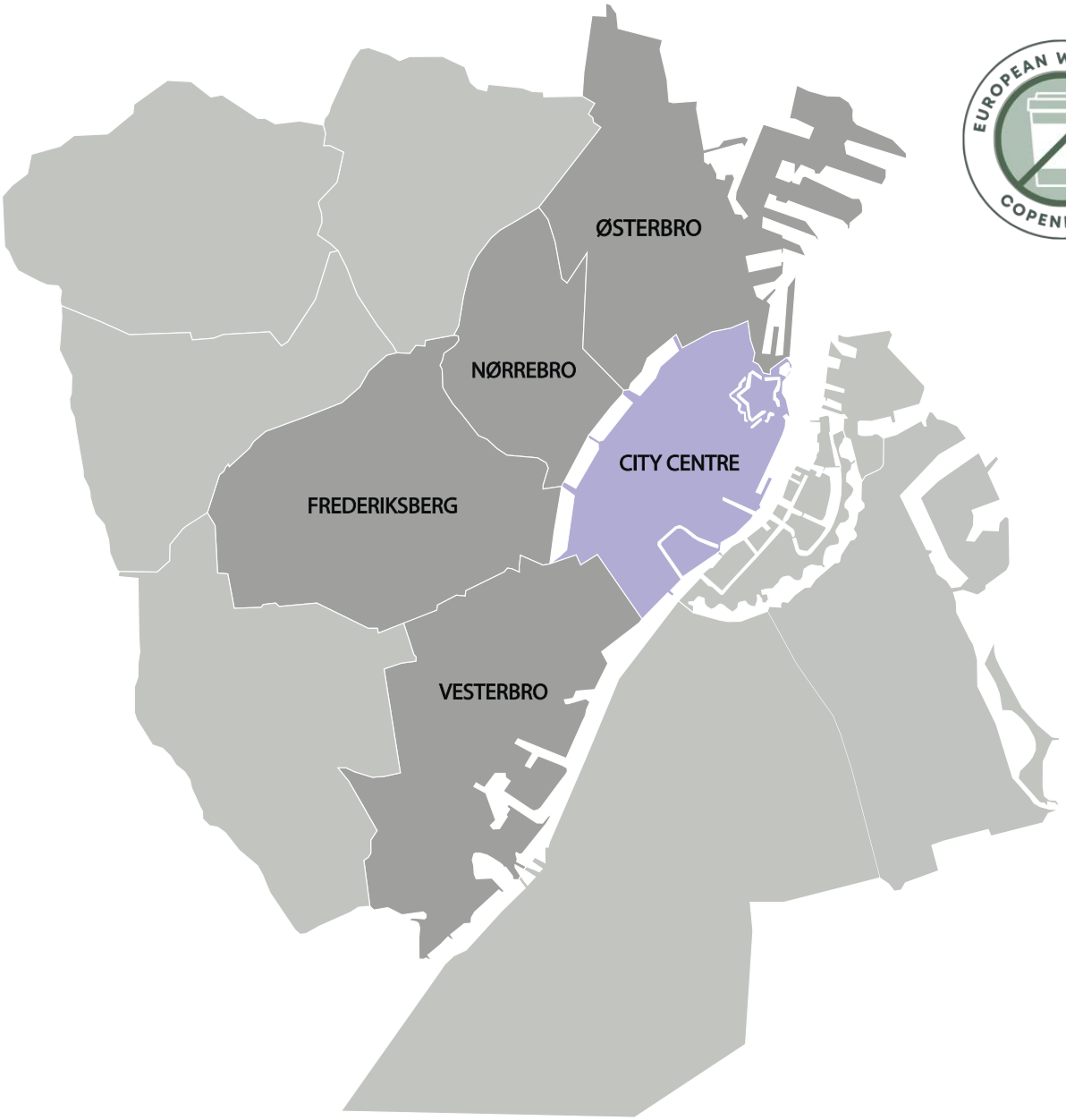
KØBENHAVN **CITY-CENTRE**

"COPENHAGEN CITY, IN THE CENTRE OF ATTENTION"



Sharon Jagt | Mae Glaese | Munji Asshiddiqi | Lilly Schott | Ruben Bruggink | Edith Marcela Arias Villalobos

European Workshop – ESA31306

TABLE OF CONTENTS

Key findings

The key findings are shortly mentioned in this chapter to give a quick preview of the geo-report.

First it is important to mention, that the chains are the highest sing-use plastic (SUP) user and both, business owners and consumers have a high influence in the SUP flow. Especially fast-food sectors have greater influence than other actors, while non-chains and pubs/ bars have lower influence.

Another important finding is that consumers and business owners were not aware of the waste management system as they thought SUP is easier to recycle and that the materials are fully non-plastic. These reasoning drive them to continue using SUP. Moreover, the gastronomic experiences, limited access of alternatives, preferences and hygiene were barriers of SUP reduction in the hospitality sector.

Lastly, while business owners and consumers may be environmentally conscious and willing to pay extra for reusables if given the option, they are frozen in their mindset and habit of using SUP.

Introduction

This report is part of a greater research project carried out by master students following the course European Workshop Environmental Sciences and Management (ESA-60312) from Wageningen University and Research. This project is commissioned by Oceana, a NGO focused on ocean conservation, to understand the use of single-use plastics (SUPs) for on-site consumption in the hospitality sector in Copenhagen. This report is part of several location specific reports (geo-reports) as well as a general synthesis report. The findings in this report evolved specifically from the data collected in the city centre, during the fieldwork in Copenhagen, Denmark. Firstly, the dynamic of the city centre of Copenhagen will be explained, followed by an explanation of the research aim, a roadmap and the methodology used for the data collection. After this introduction, the results that emerged from the fieldwork will follow, divided into four different themes.

City centre dynamics

Copenhagen's city centre is characterized by its dynamics and liveliness, which is reflected by the infrastructure and the presence of many businesses, stores, companies, tourist attractions, and hotels.[1] This busy dynamic couples with the various types of people found in the city centre, services provided, and the social activities carried out. The city centre is home to many commercial establishments and educational centres that attract consumers who use food services daily. Many stores related to design, fashion, and shopping influence the number of visitors in the city centre as well as the number of consumers that the food establishments receive.

Consequently, two main aspects stand out in the city centre, namely: the large number of tourists and the high number and variation in food establishments. Accordingly, the city centre contains more than 40 tourist attractions and over 30 accommodations where tourists can spend the night.[2,3,4] Tourism thus becomes an influential factor in terms of the existing dynamics in the city centre as well as in the demand and supply of food, which are tailored towards this type of consumer.

Secondly, the city centre's dynamic is influenced by the large amount of food establishments, both in types and number of establishments. This reflects the busy and lively character of the city centre as there is a big amount of people passing through the city centre every day, making use of the various services that the city centre has to offer. This gives a rise to the social activities in the establishments as they provide the various options for food and drinks to the visitors of the city centre. Again, the hustling city centre dynamic has an influence on the SUP use within this area because of the rising demand of handy packaging from tourists and commuters for easy take-away. Thus, many establishments tend to provide SUP as the most convenient type to fulfil the demand. This report elaborates on the different patterns, barriers and enablers regarding this SUP use. These are illustrated with data and examples collected during the two weeks of fieldwork in the city centre of Copenhagen.

Research aim and question

SUP usage within food and beverage establishments remains a problem in the city centre of Copenhagen, resulting in plastic waste pollution[5]. Such consequences do not only affect the environment but also aesthetics of the city as well as [6,7,8]. Evidently, the area accommodates various types of groups of individuals. This calls for numerous types and abundance of establishments to meet their social activities and needs. Many of these establishments still serve SUP for on-site consumption, even though they are aware of the environmental implications of it and the existence of possible alternatives. Yet, they show willingness to reduce the SUPs use (Terms of Reference, Oceana). This indicates a contradiction in awareness and behaviour that exists due to an abundance of barriers and a lack of enablers for switching from SUP to alternatives. The underlying barriers and enablers include legislative, economic and social aspects that prevent/support habitual usage of reusables, and ultimately influence the reduction of SUP in the city centre of Copenhagen. To gain further knowledge about this problem, the following research question is formulated: "What are the enablers and barriers relating to the reduction of SUP within the city centre of Copenhagen?".

Road map

This report is structured as follows: first, it discusses the methodology whereby the data collection method is outlined. This includes the explanation of data collection and approaches for data analysis.

The narrative followed afterwards is the SUP flow, starting with the first theme called "Stating the stakeholder status quo", highlighting the different stakeholders that are involved in the SUP flow. The attention is then shifted towards discussing SUP alternatives and the associated misconceptions in the second theme named "No one knows how to dispose". Since consumers believe that they are powerless in their choices regardless of the existing alternatives, awareness and willingness, the third theme is dedicated on emphasizing and elaborating on "The consumers as powerless king". To end the SUP flow, preferences and perspectives expressed by business owners and consumers are presented in the fourth theme "A mind set on SUPs". This last theme is dedicated to rethink and change tableware usage routines back to the traditional zero waste way. The report is then followed by the limitations, reflecting on the methods used. Finally, the conclusion shortly discusses the main findings of the report again.

Methodology

The project consists of three phases, which are described in the synthesis report. This methodology section centres around Phase II for the city centre, whereby specific measurement instruments were created to execute the planned fieldwork. In the following section, the methods used, and the total data collected during

this second phase, will be discussed. Details on the specific data collection and calculation can be found in the synthesis report.

In the city centre, we conducted ten interviews combined with business owner observations and surveys, to gain a better understanding of their perspectives on the use of SUP in the hospitality sector in Copenhagen. Observations of ten business owners and their establishments were carried out to get in-depth insight in underlying meanings of verbal and non-verbal communication. Furthermore, several general interviews were conducted that were not particularly for the city centre area. These interviews were conducted with other stakeholders such as NGOs, policymakers, alternative suppliers and business associations to gain a more holistic view on the barriers and enablers to supplement our findings within the city centre. During the fieldwork, 171 consumer surveys were distributed, and consumer observations were conducted in ten establishments to get more insight into consumers' daily practices in relation to the use of SUPs. Lastly, 21 material user tests (MUTs) in combination with a short survey were done to create a better perspective on consumers' preferences on alternative SUP tableware. This MUT was set up with four sets of tableware, made of four different materials (ceramic, bioplastic, paper and plastic). With these four options, consumers were asked to choose and explain their preferred tableware. A more in-depth explanation of the used methods can be found in annex A.

CHAPTER 1 | Stating the stakeholder status quo

To gain a better understanding on how SUPs are being consumed and used by diverse stakeholders, we mapped out the diverse interests and influence of several stakeholders on the use of SUPs (Figure 1). These stakeholders comprise four different types of establishments, diverse types of consumers and two policy makers. The following theme will elaborate on their position in the matrix as well as give an explanation of their current SUP use. By doing so, it will state the current status quo surrounding SUPs and the relevant stakeholders in the city centre of Copenhagen.

Figure 1. Matrix that shows relationship between stakeholders expressed in their influence and interests on SUP waste in the city centre of Copenhagen

Tourists, tenants and travellers

The first group of stakeholders to be explained are the consumers, within which we have identified three main groups present in the city centre, namely tourists, tenants and travellers (commuters). Interesting findings from the consumer survey are that more than half of the respondents (53.22 %) live in Copenhagen and almost 40 % are tourists/ live abroad. Reflected in Figure 1, of all 135 tourist who took part in the surveys across

Copenhagen, half of the responses (64) came from the city centre and said they were tourists, showing that this geo-area has the highest number of tourists (CS-1, CS). This circumstance shows that besides locals, there is a higher consumer demand from visitors, like tourists and commuters, which might lead to more take-away orders. For example, the case of a tourist who, although they planned to consume in the establishment, asked for a takeaway cup, saying: *"No, I don't want the ceramic cup. Please, give me the other cup (non-reusable) just in case I don't finish it here."* (OCC-1.2). This means that this unavoidable take-way overlap has affected a higher SUP use in the establishments due to tourists valuing time efficiency and conveniences.

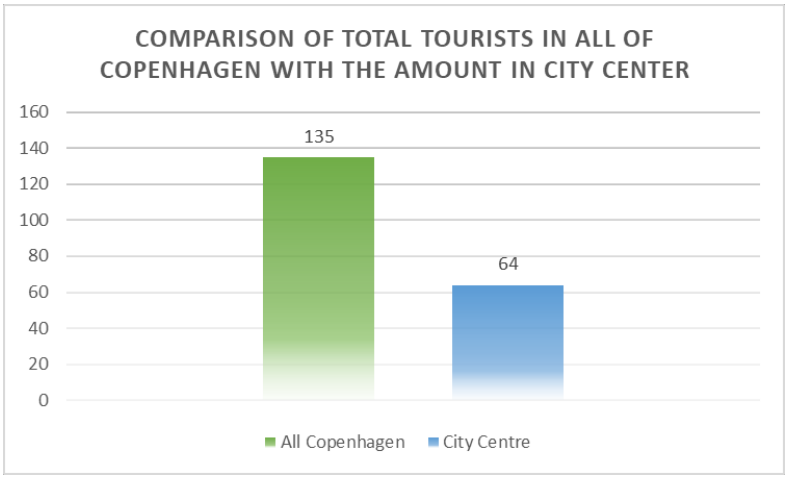


Figure 2. The total number of tourists in all of Copenhagen (considering the five districts) compared to the total number of tourists in the City Centre.

Another interesting finding is that most people are concerned that SUP is harmful to the environment (70.18 %) and have a higher awareness of using alternatives (60 %) (CS-1). However, they do not want to carry their own tableware (81.29 %): one customer said *"Where do I return it if I am on the go? I do not want to carry it for the rest of the day"* (CS-1, MUT-1). Thus, based on this discovery, consumers have high influence in the sense that most of them do not want to carry their alternatives (CS-1, MUT-1). Hence consumers expect tableware provided during on-site consumption and thereby leading to higher SUP usage. Besides, we identified food services that are related to the type of consumers and their daily activities. Since most consumers were tourists, workers, and students who preferred practical tableware, this corresponds to the waiting time to obtain the order and the ease of using and discarding the items (CS-1, OBS-1). Also, their preferences are linked to their daily activities, such as shopping, working, and traveling. These social practices limit their time to order and consume their food on-site. Again, this loops back to consumers prefer tableware that is not reusable, and therefore steering the establishments to serve food/beverages in single-use plastic packaging, contributing to higher percentage of SUP flow in Copenhagen (CS-1, MUT-1).

Businesses as usual

As mentioned in the introduction, the city centre contains many diverse types of food establishments as well as a high number of locations per establishment. Cafés and fast-food restaurants are most dominantly present, with around 80 fast-food restaurants and over 50 cafés located in the city centre[4]. Within the fast-food restaurants, 29 % is part of a chain with at least two establishments in the city centre, while 71 % of the fast-food restaurants is not part of a chain. For cafés, the number of chains is higher, with 57 % being part of a chain. These chains have a varying number of establishments in the city centre, ranging from two to eight.

Besides, 43 % of the café are not part of a chain[9]. The remainder of this section explains wherewith the portion of chain and non-chain impact how much SUPs are used, swayed by social activities and tourists.

Chains were shown to be the main contributors to the on-site consumption of SUPs in the city centre: 59 % of SUPs come from these sectors when considering the relative percentage of plastics used per year (Figure 2). Specifically, 33 % of SUPs come from the fast-food chains and 26 % from the café chains. Conversely, the non-chains contribute to 41 % of the SUPs in the city centre. Consequently, the chains have a higher influence on the types of tableware used use for on-site consumption (corresponding to Figure 1).

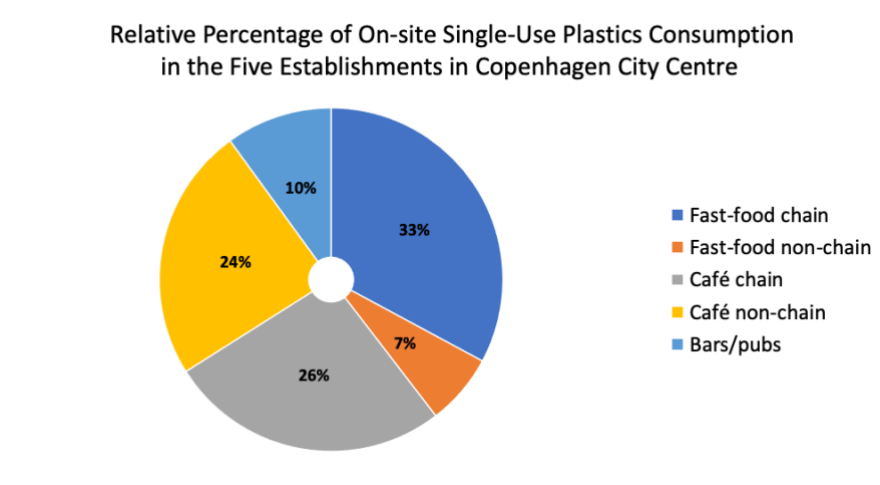


Figure 3. Calculated relative SUPs in the five establishment categories (each category n=2) during on-site consumption in Copenhagen city centre

Firstly, when looking into establishment types individually, *fast-food restaurant* together contributes to 40 % of the SUPs used in the city centre. Fast-food chains provide mainly SUP tableware and other single-use materials such as wood and paper/cardboard that in some cases comprises small amounts of plastic as well (Annex B and Figure 4). Furthermore, fast-food chains use more different types of SUP items than other categories. The higher share from this category could be justified by cups (45 pieces), cup lids (34 pieces), plastic wraps (20 pieces) and sauce containers (12pieces) being the highest contributors (Figure 3). Given that consumers go to fast-food frequently, there is a high use of SUPs in fast-food chains. In addition, they have many outlets throughout the city centre which increases their influence on the SUP consumption (in accordance with Figure 1). Interestingly, the fast-food non-chains only account for 7 % of the SUP use in the city centre, which makes it the smallest contributor. This big difference between the fast-food chains and non-chains might be explained by the large proportion of take-away in these businesses, resulting in very little on-site consumption. Like one fast-food non-chain business owner stated: *"usually we give things takeaway […] 90 % is takeaway"* (FF-1.2). Even though the percentage of SUPs in fast-food restaurants non-chain are not as high as the fast-food chains, they still have an influence on SUP consumption as they offer SUPs for on-site consumption leading to higher demand for customer to choose single-use plastic for on-site consumption.

Secondly, the *café sector* together contributes to 50 % of the on-site SUPs in the city centre. Although both café chains and café non-chains often offer reusable tableware (ceramics and glasses) as well, non-reusable items are still widely used for on-site consumption due to their convenience for both the business owner and consumer. This might be explained again by the take-away overlap that exist within these businesses, as the single-use tableware is mainly used for take-away consumption. This makes it convenient to use it for on-site as well, also in case customers want to leave before finishing their drinks. Overall, café chains are the second highest contributor to the SUP consumption, followed by the café non-chains who generate 24 % of the SUPs.

Thirdly, *bars and pubs* 'only' generate 10 % of the SUPs used in the city centre. They primarily provide reusable tableware such as glass, ceramics, and metal. Hence, it was not common to find SUPs in these establishments. Although, bar owners did indicate that there are cases where they are pushed to use to-go cups, which often contain plastic as they cannot provide glasses outside after midnight. One business owner explained that the only reason he has for using SUPs is this law. Due to a limited number of employees, he cannot control people taking glasses outside and needs to provide them plastic cups if they want to have a smoke (BAR-1.1).

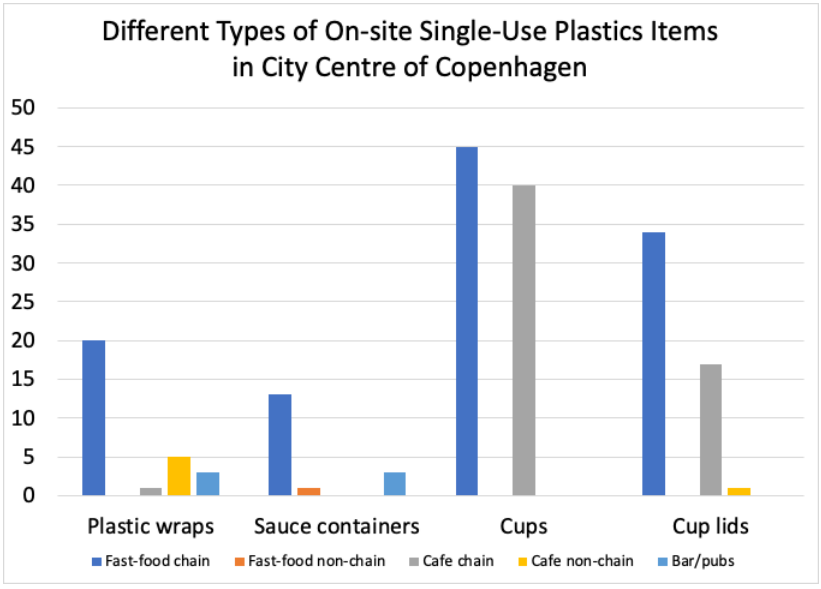


Figure 4. Top four SUP item (pieces) observed in city centre, where fast-food chain uses the most.

To conclude, the portion of chain and non-chain impact how much SUPs are used. It appears that the main contributor to the SUP problem in the city centre of Copenhagen are the chains, however, the total café sector is a big contributor as well. In general, the bars and pubs use only few SUPs and are therefore a small contributor. The difference between the groups of establishments might partly be influenced by the amount of take-away that the businesses offer. As many businesses already use SUPs for the take-away, it makes it convenient for them to use these for on-site consumption as well. Ultimately, consumers, particularly tourists and commuters play a significant role to this one third of SUP consumption come from chains.

The rulers of the game

Both the national government and the municipality of Copenhagen are not a specific stakeholder for city centre. Though, we discover that the municipality does have an influence factor on how SUPs are being organised within the city centre since they have the responsibility to ensure the collection of the waste and recycling (GOV-1). Moreover, while the business owners must pay taxes to the government for the disposal of SUPs, another reoccurring issue is the lack of municipal waste separation, they expressed that there is insufficient municipal space for separation in the city centre for all food establishments (C-1.2, BAR-1.1). Often, at the end of the day when they are closing, the places for plastic waste are already full. Consequently, plastic waste ends up in the residual waste. This makes it challenging for them to separate the plastics from the general waste and prepare it for recycling processes (BAR-1.1, C-1.1). Therefore, there could be up to 20 residual trash bags with 100 SUP cups each. A more detailed explanation on the influential and interest rate for the municipality and national government can be found in the synthesis report.

In conclusion, the characteristics of variation in population type, type of establishment, social activities and recycling system were pronounced in the city centre, and thus shape the influence, interest and use of SUP by

the main actors. Additionally, business chains, non-chains and consumers appear to have high influence but low interest in the minimisation of SUP use. Whereas municipality have low influence but high interest in this matter. Hence, through the understanding of all involved stakeholders in the city centre that have a substantial impact on the SUPs use in the four mentioned establishments, we can examine how the consumption of SUP is affected by diverse aspects which then requires collaborative action to alter the current situation.

CHAPTER 2 | No one knows how to dispose

Seeing that the consumers and business owners have the most direct influence in shaping how much SUP could be used, choices of reusables were explored with consumers. The MUT made evident that traditional and bioplastic tableware is most preferred by consumers, mainly because of its usability (MUT-1). However, when single-use tableware is used, consumers and business owners both do not know how to dispose it correctly. Which in turn causes distrust in the waste management system, as large amounts of seemingly recyclable products tend to be incinerated (MUT-1). This chapter will give an in-depth explanation of this problem.

A more detailed description of the tableware sets and the average ranking by the consumers during the MUT is shown in Table 1.

Tableware set	*Traditional*	*Bioplastic*	*Single-use*	*Reusable plastic*
Detailed description	Ceramic plate, ceramic cup, steel cutlery	Bioplastic plate, bioplastic cup, bioplastic cutlery	Paper plate, paper cup, wooden cutlery	Plastic plate, plastic cup, plastic cutlery
Average ranking	1.28	2.09	3.14	3.48

Table 1. *Average ranking of alternatives, 1 being the highest and 4 being the lowest*

From the consumer side, the average ranking clearly indicates a preference for the traditional tableware (Table 1). The reusable bioplastic set was often rated as the second most preferred option, because of its sturdiness and reusability. This was backed up with exclamations like: *"you can reuse it" and "would assume it could be used several times"* (MUT-1). However, some people dislike the bioplastic option since it is more difficult to recycle. They expressed concerns about incorrect disposal, which would pollute the environment further. Interestingly, some participants thought the single-use set was the most environmentally friendly option, which was rated as second to last option. They argued that the set is made from wood, thus seen as easily recyclable (MUT-1). Additionally, participants prefer to choose single-use compared to the reusable plastic tableware mainly because single-use paper is thought to be easier to recycle, whereas plastic costs more energy. However, what is often not considered, is the fact that paper tableware also contains a certain amount of plastic, making it impossible to recycle the content (MUT-1). The reusable plastic would thus be less harmful for the environment, but most participants do not realise this. This reinforces the idea that participants have wrong perceptions of the waste management system (MUT-1). Following these perspectives combined with

the follow up questions of the material user tests, we understand participants prefer traditional tableware over SUP. Yet, due to their beliefs that alternatives are more difficult to recycle, participants still choose SUP.

This lack of knowledge concerning the waste management system can also be found within the business owners perspective, based on interviews and observations. Many business owners do not have a recycling system in place in their facility (OFC-1.1, OBS-1). If there is recycling, it seems that at the end of the day, the bin would only be filled between half to two times a day. Whereas the non-recyclable bin would be filled up to 20 times (OBS-1). When bringing the plastics to the municipal waste location and the recycled bins are full, the business owners are uncertain where to dispose of the recyclables (BOI-1). Ultimately, they make the decisions in disposing of the plastics in the general waste bins. This indicates further mistakes made during separation in the facility. Despite placing some SUPs in the recycling bin, the owners raise questions on whether these are recycled and what would happen if it is not the case (BOI-1). Owners expect the separated recyclable waste to end up in the general bins again, indicating a distrust and disfunction in the recycling done by the municipality (BOI-1). Also, they express that they must pay a lot of taxes for their waste and that separating waste at this point is not beneficial over not separating the waste, which further strengthens their reason to not separate (C-1.2). Besides this, business owners are sometimes not fully aware of the materials they are using. For example, some business owners state that they do not use plastic but only paper cups (C-1.1, C-1.2), for example *"They [cups] got changed to paper. So, we don't use any form of plastic on that one"* (C-1.1). This shows that they are not aware that the paper cups also contain a layer of plastic on the inside.

To conclude, the main preference of consumers lies in sturdy reusable tableware. However, consumers and business owners know little about the material content of the disposables and perceive the recycling of SUP as an easy task. With these reasons, the tableware is often disposed incorrectly. Consequently, further doubt in the waste management system is created as they believe that the system does not work. This acts as barriers to prevent the reduction of SUP use.

CHAPTER 3 | The consumer as powerless king

Consumers strike to be the one with dominant power to set up the rules in the food and beverage establishments. Yet they believe that their influence on the choice of reusable alternatives is weak, which makes them appear as a king, while they feel rather powerless (MUT-1, CS-1). Several aspects must be considered in relation to the use of SUP and switch to alternative reusables. These aspects include gastronomic experience/ preference, limited access of alternatives and expectations. This is frequently demanded by the consumer and expected to fulfil high standards.

The consumers state that their food experiences influence their consumption decisions. For example, we identified that consumers do not tolerate paper straws due to their poor consistency and disturbance of the food taste (MUT-1, CS-1). Evidenced in consumer reviews like this: *"The quality and difficulty of the product*

relative to the straw does not suck, the cutlery breaks or is in a stupid shape" (CS-1). Consumers demand materials that do not influence the taste of food, pressuring the business owners to tailor the tableware in their establishment accordingly. This is clear when consumers express ideas like this one: *"It's fine if you can come up with better options for plastic. But I'm not interested if it ruins my dining experience"* (CS-1). This finding is evident in several interviews and the MUT, where consumers clearly preferred traditional tableware. Six out of 21 participants stated that they liked the traditional set because of its reusability, and another five because they were used to it. Moreover, four participants said they chose the traditional set because of its aesthetics. Participants are even willing to pay 5 to 35 Danish crowns more to get their most preferred tableware (ceramic or bio-based). Therefore, they are willing to change (MUT-1).

Although consumers care about environmental pollution caused by SUPs, they still use them for on-site consumption. This can be explained by the following three reasons:

First of all, their ability to choose the type of tableware is limited, mentioning *"It would just be nice to have an alternative"* (CS-1). We identify three main reasons why consumers do not have the possibility to select reusable tableware for on-site consumption. First, there are employees in food establishments who do not ask whether consumers want to eat or drink on-site. Second, they only have non-reusable tableware, so the consumer does not have a choice. Third, some food places offer an automated system, where the order is placed through specialized screens and delivered to the counter when it is ready to be picked up for on-site consumption. Hence, this contributes to higher SUP use on-site (MUT-1, CS-1).

Furthermore, consumers stated that they adjust to the tableware options offered by the food establishment. Because of the dynamics of the city centre, they have a high demand and supply of take-away tableware. Many consumers use non-reusable items because it is the only type of tableware that food places offer (MUT-1, CS-1). Expressed by the owners and identified in the observations, the number of orders for take-away exceeded those on-site. That is why many owners decide to standardise their tableware to non-reusable (BOI-1, OBS-1).

Finally, consumers expressed that they have expectations regarding the type of tableware depending on the type of establishment. Consumers who attend a fast-food restaurant never expect to receive reusable tableware, therefore they do not ask for reusable items. On the contrary, in a bar or café, they expect to be served with reusable tableware since it enhances the tasting and experience (MUT-1, CS-1).

The business owners will meet the consumers demand in all these cases, considering the city centre's characteristics, because the consumer is king. Aspect supported by coments from consumers, *"I don't want to worry about it - the restaurant should do it's best effort to provide recyclable / reusable tableware"* (CS-1) Yet, this also leads to an attitude of the business owners where they await the change in consumer behaviour before initiating it themselves. In addition, they also seem to wait for the government to act or create regulations that stimulate the reduction of SUP consumption (BOI-1). The attitude of certain business owners expresses that they play a big role, and that their consumers also show a certain interest, but that policy is needed to adapt and change the system (CC-1.2). There appears to be a waiting game in place, where different stakeholders are waiting for others to take responsibility and act on it.

In general, consumers prefer sturdy reusable tableware as it enhances their overall dine-in experience. However, not all businesses provide this option, mainly because of a large amount of take-away. Thus, while consumers seem to be waiting for business owners to provide them with alternatives, business owners seem to wait for regulations and policies that lift barriers and enables them to switch towards alternatives. The

consumer thus becomes a powerless king. They seem to hold a lot of power but are stuck waiting for bigger changes.

CHAPTER 4 | A mind set on single-use plastics

''I think it's an old habit that has to be changed and habits are difficult to change in general'' (FFC-6)

As clearly described by the quote, consumers and business owners alike seem to be stuck in certain routines and habits. A large environmental awareness is present in Copenhagen, yet almost nobody seems to actively align their behaviour with this awareness. This theme will further describe the routines and mindsets surrounding SUP in the city centre of Copenhagen.

It became clear that the business owners are aware of the environmental impacts of SUP. At least eight out of ten business owners state that they find it important to change the use of SUP as it would be (among other reasons) better for the environment (BOI-1). This attitude seems contradictory since at least six of them still use SUP for on-site consumption. While some of them are starting to shift away from it, others encounter more barriers. One of these barriers is the mindset and routines that they appear to be stuck in and that require change. This incorporates two main aspects; the material (business model, space, money etc.) and non-material (mindsets) routines (BOI-1). If the SUP consumption within the establishment continues, more than 6.6 million SUP pieces flow out of these sectors and potentially worsen the environmental impacts in the city (calculation explained in Appendix C) (OBS-1). One main argument that business owners stick to is the consumer demand (BOI-1). However, the mindset of consumers is not always what business owners think it is. The remainder section explains the material and non-material routines of business owners and how these relate to the consumer mindsets (MUT-1, OBS-1, CS-1).

Material routines

The business owners might have to reorganise the space in their establishment when switching from SUPs to reusables. Space is needed for example to place a dishwasher or store the reusables. Furthermore, time and money need to be invested retraining or hiring more staff, or possibly change their prices. Business owners express worries of losing customers if they change the tableware or pricing (BOI-1). The MUT showed that this worry is partly unnecessary, however, survey data would suggest otherwise (MUT-1, CS-1).

Consumers in the MUT showed a willingness to pay an extra amount of money to get their food served on the traditional plate. 42 % of the participants stated that they would be willing to bring their own tableware to a dine-in facility (CS-1, MUT-1). Two participants even had reusable tableware on them at the time of the MUT. However, the other consumers stated that planning to bring your own tableware is a problem. One consumer stated, *“if I was more organized, I will certainly do it”* (MUT-1), while another one clearly stated that he would not come back to the establishment if it was expected to bring own tableware (CS-1, MUT-1). Thus, based on the MUT, the consumer mindset seems to be very open for a switch to reusable tableware. Accordingly, the consumers themselves are not willing to bring own tableware but are willing to pay for the service (MUT-1).

On the other hand, the surveys might indicate another consumer mindset, confirming the business owners worries. In the surveys, 52 % of the consumers indicate that they are willing to pay up to 10 % more for the reusable alternative. However, another large part of consumers, 35 %, do not agree with paying extra for reusable tableware as this should be included as part of the service (CS-1). They comment that the choice of the place to consume is based on the service and experience it generates. For this reason, the establishment might have to consider bearing the costs of providing this type of tableware and thus maintain the flow of consumers that the establishment expects (CS-1, MUT-1). From this we can conclude that business owners are still stuck in their material routines and worried about losing customers, which prevents them from change. These worries cannot be fully dismissed based on our consumer data. It indicates that change in the consumer mindset is needed as well (BOI-1).

Non-material routines (mindsets)

The non-material mindset of business owners is likely to be harder to change. They rely on their work routine, which is often an unconscious process as one of our interviewees expressed: *"in personal life, you will do a lot to save the environment […], but as soon as you're in a work situation, you just work, it has to go fast. I'm not as environmentally aware in my workplace as I am in my personal life."* (BAR-1.1). Within these routines and the choices that business owners make for their tableware, their motivation is the consumer demand again (BOI-1). One reoccurring idea of business owners, which is connected to the previous theme, is for example that consumers find it unhygienic to use the reusables, especially after the Covid-19 pandemic (CS-1, MUT-1). Business owners believe that this mindset needs to change before they can switch away from SUP items (BOI-1). However, the results of the MUT show that many consumers are willing to switch to reusables. Not one participant spoke about hygienic concerns when switching to reusable alternatives. Most participants would even prefer traditional tableware or a biobased plastic tableware since these are less flexible and more comfortable in usage (MUT-1).

Overall, the data indicates that both business owners and consumers show a willingness to change towards reusable tableware (CS-1, MUT-1, BOI-1). However, their daily (working) routines and mindset prevent them from doing so. As one interviewee said about the straws: *"It was a stupid culture anyway"* (BAR-1.1) This business owner realised that he was stuck in a routine with handing out straws automatically and eventually stopped. This is a good example of how business owners might change their routines as soon as they become aware and reflect on them. Yet, like the quote in the beginning of this chapter already indicated, habits are very difficult to change. The business owners seem to be holding back due to the fear of losing customers. While consumers seem reluctant to bring their own tableware, they prefer reusable (traditional) tableware over SUP. Some of them are willing to pay extra for the use of reusable tableware. Both business owners and consumer mindsets need to change to stimulate the actual switch towards reusable tableware for on-site consumption (CS-1, MUT-1, BOI-1).

Limitations

There were several limitations to this project within the city centre. These limitations were mainly insufficient number of samples per establishment category, biases in the survey and missing information for complete SUP flow analysis.

First, two observations were done per category which makes it difficult to generalise the precise flow of SUP from all establishments in the city centre. It would have been more fitting to sample at least ten establishments per category, if time would have allowed it. In this way, discrepancy in the SUP flow in each category could be validated and we could be more confident in the obtained results. In addition, it was challenging to generalise the average SUP in the whole city when the observed hour was set for each category. For example, we have observed in the timeslot in which the two bars/ pubs provide no SUP, but according to one of business owner statements, more SUP could be handed out after midnight. These insufficient numbers of samples affect the material flow analysis for the city centre. It may have either under or overestimated the total flow, therefore affecting the accurate understanding of current SUP use.

Second, the perceptions and opinions from consumers may be biased as there were mainly young people and few older generations filling it in. This may have skewed the data on less barriers from the consumer perspectives related to SUP use. Furthermore, more tourists filled in the survey, which could affect the preferred alternative options as they may be in the mindset of mobilising through the city quickly (take-away overlap), hence naturally choosing an option that is convenient. However, tourist do form an important group of consumers in the city centre, which makes their input valuable as well.

Third, a substantial amount of information was missing. The major relevant information included total number of businesses, total average number of consumers in one business per day and number of SUP order per month were missing. These were not accessible or retrievable from the municipality of Copenhagen or from observations/ interviews. The missing information impacted a complete overview and true insights into the total number of SUP in the city centre, hindering the confidence in which category produces the biggest SUP flow and to what extent the problem is sever in the city centre.

The last limitation lies in the stakeholder analysis, where interviewers asked about corresponding stakeholders about their experience of power and influence on plastic waste in the hospitality sectors. Their experiences of power and influence could be different from reality. For instance, national legislations could influence the local legislations in positive and negative way, that is expressed different from their statements. This difference could affect the true relationship of stakeholders with each other and thus prevent effective collaboration to minimise the SUP use in the hospitality sector.

Conclusion

The SUP flow started with the stakeholder status quo in which the power relations between them was shown while presenting their interests. It became clear that the main SUP contributors are stakeholders with high influence. From the stakeholder matrix it was possible to dive deeper into the misconceptions of them as well as the actual preferences of the consumers. Continuing with the consumers, we took a profound look at the influence/ power they have in the SUP flow. There we could see that consumers play an important role in the switch to reusable alternatives but they are not aware of it and often are not able to express their actual

preference at the establishments. Starting from all stakeholders, the geo-report continued to narrow down the main barriers and enablers of everyone, ending with one of the key leverages of changing established routines in our society, the mindsets.

We had several key findings. *Firstly,* while many places come with a high use of SUP due to the dynamics in the city centre, others provide mainly reusable tableware. The dynamics are characterised by the high tourism in the city centre which comes with quick changes of locations from different tourist attractions and little time. This leads to more take-away. At the same time, other visitors have different standards towards the establishments. Accordingly, the attitudes, routines and behaviours of the different institutions diverge greatly. Therefore, the different benefits and opinions about SUP are as diverse as the city centre itself.

Secondly, the insufficient municipal space to separate waste made waste separation impossible as one of the first steps for successful recycling. This issue goes hand in hand with the lack of knowledge, from the business owners as well as consumers, on the correct disposal of non-reusable tableware. Many think that disposable sets are fully made from paper while they contain plastic, which hinders the possibility of recycling. This lack of knowledge needs to be tackled in order to reduce the distrust of citizens in the waste management system. Furthermore, many are unaware of existing and available alternatives for SUP. They are hesitant to change the daily routines of their business, including the constant provision of it. Therefore, this is a barrier hindering them to switch to reusables.

Thirdly, as the plastic pollution is a global issue affecting everyone, everyone should take responsibility and action. However, it became evident that in the city centre, responsibility taken up regarding plastic pollution is lacking. While the consumers wait for the provision of better alternatives, business owners are waiting for new policies to be implemented. The fear connects to waiting for other stakeholders to take the responsibility and implement possible solutions for the SUP issue in the city centre of Copenhagen. Business owners must compete to have the most customers and keep their business alive. However, the customers are mainly only visitors in the city centre. Therefore, it is difficult to build up a regular clientele for the establishments. Changes, like the switch to reusables, can therefore have a significant impact on the success of the business owners.

Fourthly, each stakeholder has a different level of influence and interest, but all of them are waiting for the others to take responsibility. In reality, consumers strongly prefer reusable tableware over SUPs, even with a small increase in the price.

Lastly to conclude this report, both consumers and business owners in the city centre would like to change to not harm the environment any further. At the same time, they would like to keep or develop a standard, in the sense of convenience and time efficiency, that has been developed through time. Potential solutions to the problem need to keep this in mind in order to tackle as many barriers as possible going accoupling these standards.

To answer our research question: "what are the enablers and barriers relating to the reduction of SUPs within the city centre of Copenhagen", we summarised multiple aspects in the following table:

Perspectives	Main barriers	Main enablers
Consumer	>Consumers do not want to carry alternatives with them (Theme 1) >Consumers feel powerless with the options consumers can choose, the system must change first (Theme 3) >Consumers are stuck in mindset and routines (Theme 4)	>Willingness to adopt using reusables (Theme 3) >Consumers are willing to pay more for reusables (only in MUT, survey results indicated the opposite) (Theme 4)
Business owner	>SUP as most time efficient, avoiding time needed for cleaning (Theme 1) >Less organisation needed since provide same tableware for on-site and take-away in one (Theme 1) >Insufficient space for recycling (Theme 2) >Automated systems for ordering that do not allow options for own reusable alternatives (Theme 3) >Insufficient space for dishwasher and storage of alternatives (Theme 4)	>Stop paying the taxes of SUPs to the government (Theme 1)
Policy maker	>Municipality is not in power of banning SUP in the city (Theme 1) >Due to current policy, the business owners must provide alternatives to glasses after midnight (Theme 4)	>Municipality has less organisational work of the waste collection and processing (Theme 1)

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Annex

A. Tables

Table 1. *Overview of data collection method used in city centre and its relevance for analysis.*

Data collection method (instrument)	Description/ value	Themes used
Interviews	The interviews consisted of 16 questions, divided into five topics. The topics covered SUP use, reusable alternatives, shifting from SUPs to alternatives and a finalisation of the interview. Besides, there was an introduction and conclusion incorporated into the interview, which included more general questions on the interviewee and the business. The interviews were semi-structured, thus the specific questions asked per interviewee differed, depending on the answers given and the SUP use of this interviewee. A total of nine interviews have been conducted with business owners inside the city centre. These interviews lasted 10-20 minutes and were conducted in the business itself. One general interview was conducted with a fast-food chain that is located in several geo-areas, including the city centre. The interviews were recorded and transcribed afterwards.	Theme 1, 2, 3 and 4
Survey	The survey consisted of 33 questions, divided into three topics. These topics comprise specific questions about fast-food restaurants, cafés and pubs/ bars. In general, the questionaries were asking demographic questions followed by questions regarding consumer's preference in three different types of establishments. Besides, the survey also consists of some open questions which allow respondents to express their opinion on certain subjects. The survey was also provided in several languages to make it easier for respondents to answer the questions. Overall, a total 271 of responses was collected during the data collection. Since some of the respondents did not complete all questions only 171 responses were valid and analysed as findings in the geo-report.	Theme 1, 3, and 4
MUT	In the city centre the MUT was conducted in 2 separate locations. 11 participants came by on the terrace of a café non-chain that served only single-use cups. 10 participants joined the MUT at the other location, which was on a square with substantial amounts of foot traffic. The MUT was conducted using 4 different sets of tableware (ceramic, bioplastic, paper and plastic). First consumers were asked to rank the tableware from their most preferred to their least preferred. This was then followed up with a few questions.	Theme 2, 3 and 4

	The first questions asked for the explanation of the consumers choice. The aim of this question was to gather a deeper insight into the thought process behind choosing a particular set of tableware. The second and third question asked if the consumer would be willing to pay for the most preferred tableware and if the consumer would be willing to bring their own reusable tableware. The aim of these questions was to inquire about the willingness to change their behaviour.	
Observation	The observation consisted of two parts. The first part noted the behaviour of the business owner and the establishment during the interview (for example behaviour, body language, tone of speech and facial expressions are paid attention to; visibility of SUPs/ reusable tableware in establishment were noted). This was used to see whether their actions are in accordance with perspectives and attitudes. The second part was split into two subtasks. A) An observation table was used at every place visited; some items were counted, and others described in order to understand the habits and practices carried out by consumers. B) The number of each SUP item were observed during peak hours. The number of chairs were counted to estimate the average number of customers and make a total SUP calculation for city centre.	Theme 1-4

Table 2. *Raw number of SUPs observed per item across all hospitality categories*

Type of establishment/ Item type	Fast-food chain	Fast-food non-chain	Café chain	Café non-chain	Bar/ Pubs
Plastic wraps	20	0	1	5	3
Utensils	0	1	0	0	0
Straws	0	0	0	2	0
Sauce containers	13	1	0	0	3
Cups	45	0	40	0	0
Cup lids	34	0	17	1	0
Stirrers	0	0	0	0	0
Plates	0	0	0	0	0
Drink bottles	0	5	0	0	0
Food boxes	45	0	0	0	0
Ice cream containers	7	0	0	0	0

The observed items of different SUPs were counted for every category of establishment. It shows that cups, cup lids and plastic wraps are used the most in fast-food chain and café chain.

B. Figures

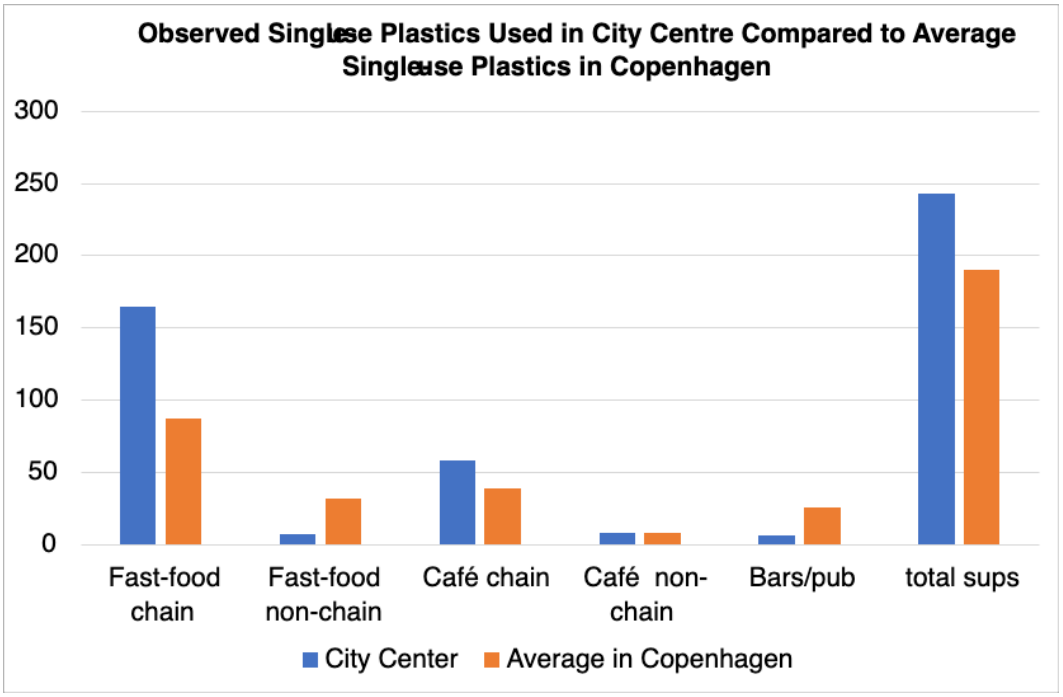


Figure 1. *Observed SUPs use in city centre compared to the average amount in Copenhagen, highlighting that numbers of SUPs in chains are higher.*

Type of establishment/Item type	Fast-food chain	Fast-food non-chain	Café chain	Café non-chain	Bars/Pubs
Plastic wraps	0,108	0,000	0,010	0,116	0,052
Utensils	0,000	0,022	0,000	0,000	0,000
Straws	0,000	0,000	0,000	0,047	0,000
Sauce containers	0,070	0,022	0,000	0,000	0,052
Cups	0,243	0,000	0,396	0,000	0,000
Cup lids	0,184	0,000	0,168	0,023	0,000
Stirrers	0,000	0,000	0,000	0,000	0,000
Plates	0,000	0,000	0,000	0,000	0,000
Drink bottles	0,000	0,111	0,000	0,000	0,000
Food boxes	0,243	0,000	0,000	0,000	0,000
ice cream containers	0,038	0,000	0,000	0,000	0,000
Number of consumer observed	185,000	45,000	101,000	43,000	58,000

Figure 2. *Average number of SUP consumption per consumer in the five establishments during on-site consumption in city centre*

Type	Average number of SUPs per consumer	Total consumer observed	Total number of SUPs
Fast-food chain	0,8864865	185	164
Fast-food non-chain	0,1555556	45	7
Café chain	0,5742574	101	58
Café non-chain	0,1860465	43	8
Bars/Pubs	0,1034483	58	6

Figure 3. *Average number of SUPs per consumer per establishment category during on-site consumption in city centre (in bar graph)*

C. Calculation/ explanation derivation of numbers

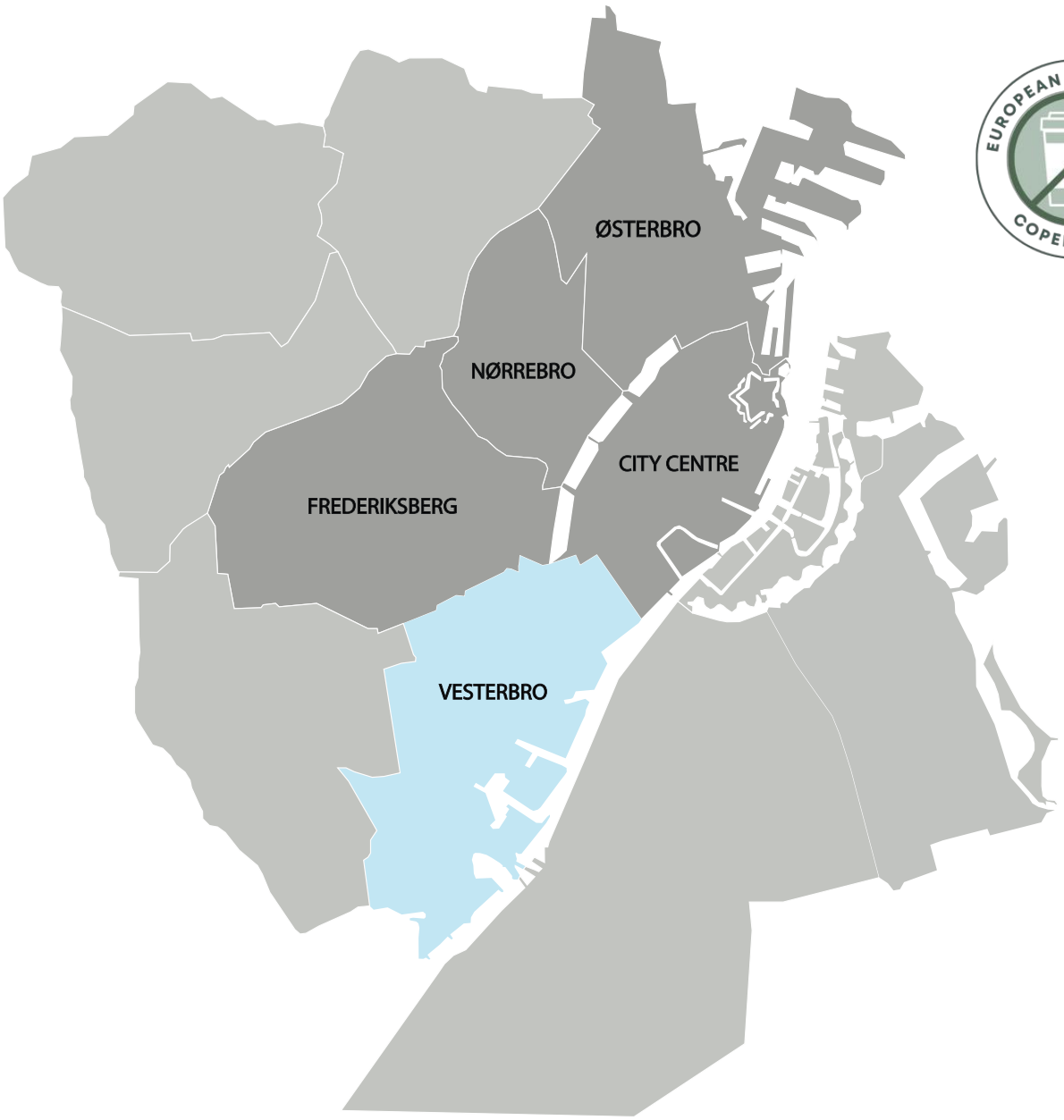
Calculation of average SUPs in city centre

The total number of observed SUP in establishments (n=10) of city centre areas was summed up. The number of observed consumers was divided with total number to obtain SUPs per consumer. This was done per category. The same method was done for SUP item.

Calculation of average SUPs in Copenhagen

The total number of SUP used in the city centre was estimated through the survey data. In surveys, we extrapolate the information about habits of people, specifically on the frequency of visiting fast-food, café and bars. In addition, we retrieved data from citypopulation.de (2022) to apply the number of people living in city centre. Worlddata.info was used to consider the tourists coming into the city centre per day. Therefore, we calculated the total amount of SUP pieces used in the area per year.

KØBENHAVN **VESTERBRO**



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European Workshop – ESA31306

Table of Contents

Introduction – Setting the stage

Within this Geo-report we present the results and analyses of the *European Workshop Copenhagen* for the area Vesterbro. This research is conducted by a team of Master Students from the Wageningen University and Research as a consultancy assignment for the NGO OCEANA. The research scope of the report is on the phase-out of single-use plastics for on-site consumption within the city of Copenhagen.

The report focuses on the area Vesterbro, which is the second most densely populated area in Copenhagen. Vesterbro has a population of 35000 and an approximate density of 13688 citizens per km². The neighbourhood covers an area of 3.76 km² and is located to the south of Frederiksberg and to the west of the city centre[i]. Historically known as the red-light district and a transfer area towards the city centre, Vesterbro has in the recent years evolved into a trendy multifunctional area. Now, Vesterbro is a residential area combined with shopping districts, restaurants, and recreation services. Some highlights of the area are the meatpacking district, the central train station, the famous Det Ny Theatre and the Tivoli Theme Park. [ii]

Over the last decades, scientific evidence has increasingly emphasised the threat of plastic waste pollution caused by Single Use Plastics (SUPs) used within the restaurant and cafe sector. With the simultaneous increase of plastic use in our daily lives it has become evident that the current consumption levels of plastics have created an unprecedented problem. The lack of the proper disposal and recycling of plastics has introduced large sums of plastics into the oceans. A report publicised by OCEANA in 2021 estimates the total use of SUP cups for take-away by Danes to be 130 million per year, from which 130000 end up in the ocean and strongly pollute the marine ecosystem.[iii]

In addition to the SUPs used for take-away, there is a separated flow of SUPs that entails the materials used for on-site consumption. On-site SUPs refer to all Single Use Plastics used for consumption within the hospitality sector. The aim of this report is to achieve more insights into the current situation and identify existing barriers to and enablers of a (legislative) shift from SUPs to reusable alternatives. This leads to the following research question:

"What are barriers to and enablers of a (legislative) shift away from SUPs to reusables for on-site consumption in Vesterbro?"

To answer this question, we apply five different analyses compiled into the following five unique Chapters:

Table 1. *Description of themes*

Name theme	Description	Analyses used
1) (Meat) packaging	Named after the characteristic meat packing district where a wide variety of stakeholders would come together and sell meat for distribution, this theme explores the quantitative differences between the current businesses. The word packaging hints to the current use of SUP for on-site consumption.	MFA, SPA, CDA, SHA
2) Dare devils	Taking inspiration from the Tivoli Amusement Park, this theme compares the differences between the daring entrepreneurs who lead the restaurant and café sector.	SPA, MCA
3) Ticket holders	Continuing with the Tivoli theme, this theme explores the consumers' perspective and behaviour regarding SUPs.	MCA, SPA
4) Pulling the curtain	In tribute to the famous theatre Det Ny Theatre, this theme combines the previous themes and gather all stakeholders on the stage to highlight their responsibility with a *stakeholder matrix*.	MCA, SHA, Workshop
5) Transfer in the train station	Using the train station as a metaphor for the (legislative) shift from SUPs to reusable alternatives, this theme enters the next station and emphasis important aspects that influence a sustainable implementation of a legislative bon on SUPs.	MCA, SPA, CDA

Methodology

The first phase of this research consisted of a client meeting, desk research and preparations for the fieldwork. Desk research consisted of searching for policy documents and literature on plastic and waste management. Specific measurement instruments were created in order to execute the planned fieldwork in Vesterbro. We defined categories for the establishments: Fast food chain, Fast food non-chain, Café chain, Café non-chain and Bars/Pubs. The analysis does not include traditional restaurants as they do not use a substantial number of SUPs for on-site consumption. In the following section we will elaborate on the methods, and the total data collected during the second phase of the research.

We conducted 16 interviews with business owners or employees to gain a better understanding of their perspective on the use of SUPs in Copenhagen in the hospitality sector. Furthermore, during the interviews, we did observations of business owners, and their establishments to get more in-depth insight in underlying meanings of verbal and non-verbal communication. The interviews were conducted in three bars/pubs, eight non-chain café's, one café's chain, two non-chain fast-food restaurants and two fast-food chains. Furthermore, we also

conducted interviews with other relevant stakeholders to gain a more holistic view on the barriers to and enablers of the issue at hand.

Besides that, we distributed consumer surveys (CS) to get more insight into consumers' daily practices in relation to the use of SUPs in the hospitality sector in Copenhagen. In the end, we collected a total of 131 finished responses. Thereof, 65% are women, 32% are men. Most respondents live in Copenhagen (70%) and around 15% were tourists. The rest either works in Copenhagen but lives elsewhere, or simply lives elsewhere in Denmark. Approximately half of the respondents are students or workers. More than 50% between 21-30, 20% between 31-40, 14% of respondents were aged 20 or younger, and the remainder was 41-63 years old.

In addition, we conducted a total of consumer observations (OBS) inside establishments, where we paid attention to the behavior of the consumers and to specific components of the venue. These were done in twelve establishments, of which two were bars/pubs, three were non-chain café's, three were café chains, one was non-chain fast-food restaurants and three were fast-food chains.

Lastly, we conducted 20 material user tests (MUT) in combination with a short survey to attain a better perspective on consumers' preferences on alternative SUP tableware based on a ranking of four different bundles.

CHAPTER 1 | (Meat) Packaging

Within this chapter we present the current situation surrounding SUPs and identify which group of actors and types of SUPs contribute the most to the total flow of SUPs. See Annex III of the synthesis report for a more elaborate description of the methodology used for the data collection and the approach that was taken for the calculations of the MFA.

Current situation

The results of the Material Flow Analysis are compiled into the following figures:

- **Figure 1:** Average number of SUPs used per consumer per business category
- **Figure 2:** Percentage of SUPs types within the total flow (%)
- **Figure 3:** Estimated Total SUPs in Different Type of Establishment in Vesterbro

All Figures are based on the calculations that can be found in Annex 1.

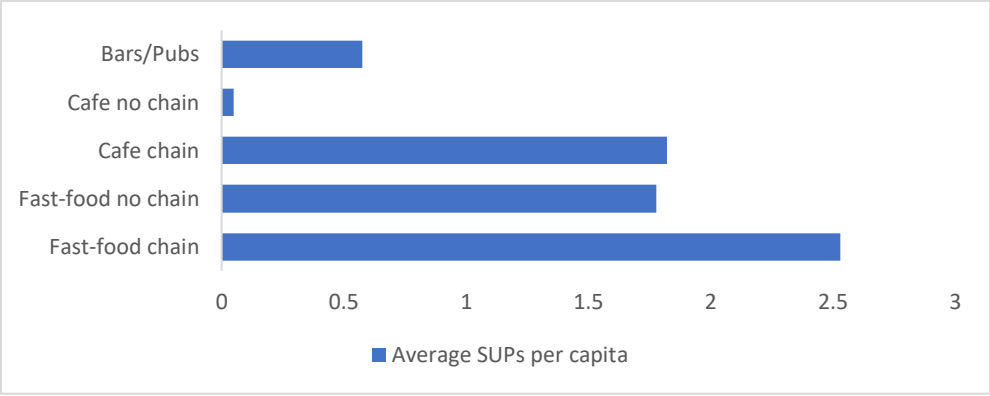

Figure 1. *Average amount of Single Use Plastics used per consumer per business category.*

As shown in Figure 1, we identified that consumers within the *'fast-food chain'* category use the largest number of SUPs (2.5) and the *'café no chain'* the least (0.05). The high number of SUPs within the fast-food sector is mainly caused by the use of plastic wraps, sauce containers, and plastic cups. Within chain cafés the higher use of SUPs compared to non-chain cafés are the results of an observed practice where hot drinks were served in reusable cups and cold drinks in plastic cups. In contradiction, the observed chain café also showed the use of reusable cups for their cold drinks in their on-site advertisement and encouraged their consumers to bring their own cup in exchange for a discount. The location wants to encourage reuse; however, they do not comply with this for cold drinks. Thus, contradicting their own advertisement. In most chain venues the employees asked whether the customer wanted to sit in the establishment or take their order for take-away. In most cases this did not change the type of packaging used, pointing towards a correlation between take-away and the use of SUPs for on-site consumption. In one café chain, the reusable and non-reusable plates were used on a random basis, but cups were always non-reusable (OCC-2.2).

Within non-chain cafés and bars/pubs, the use of these SUPs is uncommon and reusable tableware are the norm (ceramics, glass, and similar materials). The slightly higher use within the bars/pubs are caused by plastic sauce containers and plastic wraps related to small bites.

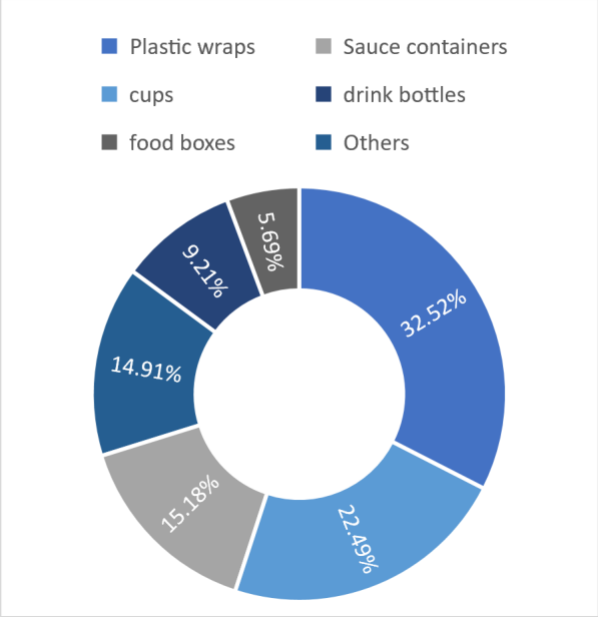

Figure 2. *Percentage of different uses of Single Use Plastics within the total flow*

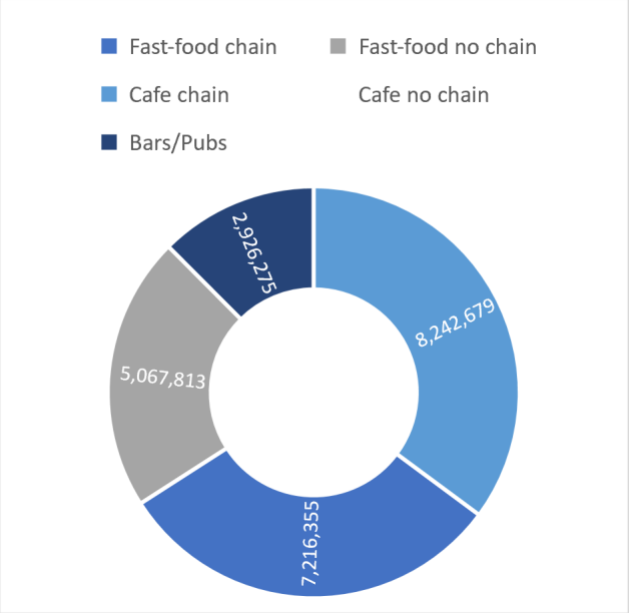

Figure 3. *Estimated Total number of Single Use Plastics (pieces) in Different Type of Establishment in Vesterbro*

In Figure 2, we examine the total use of SUPs independent from their business category. Through this approach we identified that the *'plastic wraps'* contribute the largest number of SUP (33%) followed by *'cups'* (22%) and *'sauce storage containers'* (15%) to the total flow within Vesterbro. The low use of straws (2%) is the result of a successfully implemented ban by the EU on plastic straws.[iv] If a business owner has a remaining stock of plastic straws, they are allowed to use them.

In Figure 3, we consider how the frequency of people visiting the establishment affects the use of SUPs in different categories. The diagram depicts the highest number of SUPs comes from the chains (both café and fast-food restaurant), while the café non-chain is the least SUPs user due to the lower number of seats available and since

SUPs are mainly used for take-away rather than on-site consumption. In general, we estimated that about 23,4 million SUPs are used for on-site service in the establishment within Vesterbro.

Limitations and assumptions

To calculate the results from the previous section, the following limitations exist, and assumptions are made:

- Based on a limited sample
- The total number of restaurants and cafés have been estimated with google maps
- Observations are done during different opening hours influencing the accuracy of the results

The key insights chapter 1:

- Fast Food businesses and chain-cafes use the highest number of SUPs per customer
- Plastic wraps and cups make up more than 50% of the total SUP flow
- Chain establishments combined are estimated to use more SUPs on-site than the non-chains
- Contradiction between (environmentally aware) advertisement and actual practice.

CHAPTER 2 | Dare Devils

The current situation presented in the previous chapter shows that not only are fast-food establishments and chains still using single-use plastic tableware, but they also contribute to the highest amount of SUP waste. This chapter elaborates that the business owners are nevertheless focusing on the use of sustainable materials. We examine how business owners view (the use of) SUPs, (non)reusable alternatives, problems in switching to alternative materials for tableware, and sustainability as a topic in general. On the one hand, business owners generally speak negatively about SUPs. On the other hand, they also mention reasons for not being able to get rid of SUP completely.

Negative connotations on SUPs

During the interviews, business owners and other employees indicated that they make little use of single-use plastic. However, when asked if they use sauce containers was given, the interviewees regularly realized that they did use these items but were not aware that they were considered as SUPs. The following quote and the result from the observations proves this lack of awareness about the use of SUPs by a business owner.

"*I think we are surprised (at) how much actually we do use.*" (C-2.8)

Underlying **attitudes** towards plastic are generally not positive. It turned out that the words 'single-use plastics' have a negative connotation, indicated by the words "*bad*" and "*avoid*" (C-2.1, FF-2.2). Reasons they gave for using the SUPs despite the negative attitude towards it were convenience and that it was difficult to obtain (reusable) alternatives.

The use of other disposable materials also has a negative connotation, because these other single-use alternatives turned out to have drawbacks on price and quality; "*First, the [paper] straws got really soft in the milkshakes. Now we've got some better straws. They hold a little bit longer. But usually, we give two straws to each consumer, as they get soft*" and "*paper cup [...] is more expensive*" (FFC-2.2, BAR-2.2).

Attitudes towards reusables

"I think we should just get rid of as much things that are hurting the environment as possible." indicates the willingness of business owners to change towards only reusable tableware within establishment. Words such as 'pleasant' and 'sustainable' indicate the positive connotation that business owners have when using recyclable materials (CC-2.1, C-2.2, C-2.8). Additionally, business owners express that it is important to become more sustainable: "*Environmental impacts, to be more sustainable*" and "*It is not for us only, it is for our children.*", it has also been stated that "*it has always been like this from the start*." (C-2.8, C-2.6). The use of disposable plastic is also seen as unnecessary and using reusables is for many the norm and adds to the green image of the business.

"*I don't think it's necessary at all for onsite consumption to use any plastic*." (C-2.2)

"*It is good for the brand to get like a green image*." (FFC-2.1)

Reasons not to switch

Despite the advantages and willingness, the interviewees gave various reasons that hold them back from using reusable tableware. One interviewee indicated that he foresees problems with cleaning the reusable materials and sees their (investment) costs as an obstacle:

"*It will take longer time to clean and stuff like that. And in the short run, it would be a lot more expensive*." (FFC-2.1).

In addition, external factors such as stealing, hygiene, legislation and the difficulty of finding reusable alternatives that are suited for the establishment are among the reasons for businesses to not have completely switched yet (C-2.5, FFC-2.2, FF-2.2).

When running an establishment, economic interests are one of the main priorities for business owners. Establishments put emphasis on making profit for their operations, and thus high investment costs or energy prices impede business owners from making the switch. Simultaneously, business owners have ambiguous opinions on whether disposable materials are in fact the cheaper option disposable. There appear to be different ideas about whether disposable materials are the cheaper option or reusable tableware. These reasons lead to a mismatch between the willingness of business owners and the actual behavior.

Different perceptions

Perceptions differ when we looked at how business owners think about the current use of disposables as whole. The quote "*And I think the throwing away community thing that was before. Like, buy, use, buy, use... and throw away*." (C-2.8) shows that the interviewee sees the throw-away culture as something of the past. While on the other hand it was stated that throwing away is the easiest and cheapest option.

"*Plastic is cheaper and you throw out*" (FF-2.1).

Nevertheless, overall, business owners try to make as little use as possible of disposable items, because:

"*If it's not reusable, like carton straws, or carton cups, we create a lot more trash*" (FFC-2.2).

Concluding from the analyses it was not possible to distinguish between the different establishments in attitude towards single-use plastic. In general, there appears to be a mix between feeling that the sector is already well on its way in terms of not using single-use plastic (anymore) with, on the other hand, hoping that the café and restaurant sector will do better in the future. This is confirmed by the quotes "*I see that in Copenhagen we are super concerned about the plastic uses and we are avoiding in all of the restaurant… they are avoiding using some plastics. So, at the moment, I think that […] here in Copenhagen […] they are super conscious about the plastics*

and the contamination" and "restaurants should take more responsibility" (FF-2.2, C-2.7). What does emerge from these statements, however, is that there is a shared sense of responsibility for taking action.

The key insights chapter 2:

- It is not possible to distinguish between different business categories in terms of attitude
- There is an overall shared sense of responsibility
- SUPs have a negative connotation
- Economic interest, availability of alternatives, and food safety are barriers to the switch to alternatives

CHAPTER 3 | Ticket Holders

This Chapter explores the question of what the consumer is looking for, how they perceive the use of SUPs, what their attitudes and behavior are, and whether they can possibly demand the change of using SUPs. Through the analysis in Vesterbro, it came to light that consumer attitudes towards the use of SUPs are generally quite negative, however their actual behavior varied depending on the type of establishment they visited. From both the CS and the MUT, we found that most of the participants prefer reusable tableware over SUPs.

Establishment type matters

The data reflect that consumer visit different establishments for different purposes. Within the survey, among those who visit fast-food restaurants, 70% said to prefer to take-away their food; whereas more than 95% of people who visit cafés and bars prefer on-site consumption. Accordingly, 80% of the respondents go to fast-food restaurants only to eat or drink something, whereas visiting a café or a bar is often also done with the purpose of socializing, spending free time, dating, studying, or working.

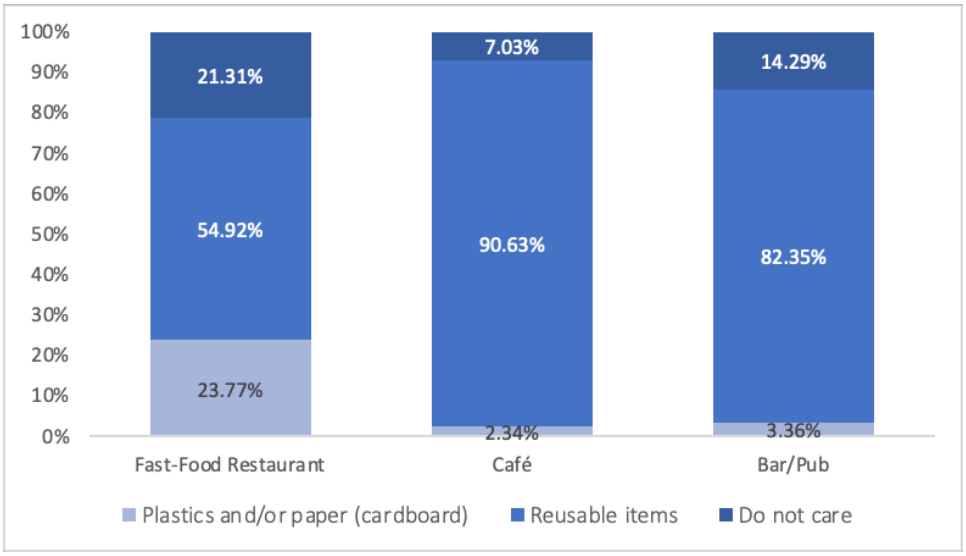

Figure 3. Consumers' preference for various types of tableware in cafés, bars and fast-food restaurants in Vesterbro (in percentages).

More than 50% of the respondents indicated they would prefer reusable tableware (see Figure 4), with reasonings such as it being reusable, sustainable, good for the environment, prettier, nicer to eat or drink from, better quality and thus in general reusables create a better experience. Several participants also said that they want to reduce their use of single-use plastic and care for the environment, but that it is very difficult in fast-food restaurants. One participant said, "*I hate paper straws because they quickly become nasty and useless. At the same time, I try to avoid plastic, but it just functions so much better*" (CS).

With that, there is a percentage of consumers that prefer single-use items (24%) or simply do not care (21%) about the type of tableware when visiting a fast-food restaurant compared to visiting cafés and bars. Those that do not care, mention "*I go to fast-food when I'm too drunk to care*", "*it just has to be fast*", "*the food is more important*" and "*convenience*". Similarly, reasons for preferring single-use materials are that it is easier to use and throw away, faster, cheaper, cleaner and more convenient such that leftovers can be taken to-go.

For those visiting cafes, few stated they were indifferent or did not care. Only a small percentage of consumers specified they would prefer plastic and or paper/cardboard, mainly for hygiene, ease of use and it being lightweight. Of those who said they preferred reusable items (90%), almost half mentioned that it is better for the environment or that reusability is important. Additionally, some stated that it makes more sense to receive reusable tableware since they stay at the café and consume their food/drinks on site. Aesthetics, taste, feel, coziness/homeliness, quality and niceness in general were also important factors. Other comments were "*It feels like the owners care about their consumers' experience*" and "*reusables are free from toxic chemicals*". It also seemed like consumers expected it to be more convenient and cheaper for the business to use reusable items.

In a bar, overall, still 90% of respondents preferred reusable tableware. They often mentioned the better taste, nicer material feeling, better aesthetics, higher quality, a better experience and that they do not like plastic. One participant mentioned that reusability is synonymous with sustainability and therefore gives a more reputable feel to the café and its brand. On the other hand, more people seemed to not care rather than per se preferring Single Use Plastics compared to in a café. Someone said, "*I don't think about it after beer number 4*" and others seemed to agree.

All of this indicates that visiting a café or bar is more often done with the intention of the experience whereas visiting fast-food restaurants is more about fast pace and convenience. Therefore, the use of tableware is of lesser importance when visiting a fast-food restaurant, yet many consumers still seem to indicate that reusable items are preferred and thus that maybe a change should be made in all the establishments, for both a better experience but also for the environment.

Tableware preferences

During the MUT, 15 of the participants (75%) selected the traditional tableware bundle as their most preferred option. The bundle consisted of a porcelain plate and glass, and silverware cutlery. These results are in accordance with the results of the survey where reusable items across all three establishments (i.e., bar, fast food restaurant and café).

The MUT highlighted that there is a general willingness to pay for a reusable item among the respondents in Vesterbro. Some said that they would be willing to pay 5 to 10 more Kr and others indicated percentages that would vary according to the price of food or beverage purchased (a range from 5-20%). Essentially, people prefer what they consider to be "homey" or "cozy" ("hygge" - a Danish word to describe coziness), and "familiar". Additionally, only three MUT participants mentioned sustainability as the reason for choosing the traditional tableware as their first option. Thus, it can be deduced that the environmental impact is not a primary factor for choosing reusable tableware, but that instead people favor the bundle that seems the most familiar.

Figure 4. *Material user test conduction*

In terms of paying an additional price, the responses in the survey point also to different attitudes. Almost 50% of respondents in the survey said they would be willing to pay up to 10% more; 11% said they would be willing to pay up to 20% more and 2 respondents even said being willing to pay up to 30% more. Still, more than a third would not be willing to pay anything extra. This resonates with the opinion of one of the workshop participants who believes that it would be unfair if she had to pay extra (SWNGO-1). One survey participant even mentioned that "*anyone will use items that are more convenient and cheaper than plastics, but any solution where people have to pay more or work harder simply won't work*".

The other way around, 70% of participants said they would be more inclined to bring their own reusable tableware to an establishment if they would get a discount for doing so. However, this would mostly be focused on take-away (e.g., take-away coffee) and less on on-site consumption. Additionally, when asked whether participants prefer going to a place where you can use your own reusable tableware, there was approximately an equal division between those who were indifferent and those who would prefer it but do not actively look for those types of places. Less than 5% intentionally goes to these kinds of places.

Relating these statements from consumers with the observations, nobody was seen bringing their own reusable tableware. A possible explanation could be changed habits due to Covid-19. More specifically, one of the interviewees said that customers used to bring their own cups before Covid times, but during Covid customers were told no longer to bring their own cups due to hygiene. Therefore, she said "*so maybe people… they kind of lost the habit, I think*" (C-2.8). This resonates with several participants indicating in the survey that they have hygiene concerns regarding the use of reusable items.

In the survey, we asked consumers to rank what they consider to be the most important criteria when choosing a reusable alternative if Copenhagen were to move away from SUPs. In contrast to the MUT, 70% of the respondents ranked environmental benefit as the most important criteria for them. However, as this was the last question in the survey, participants were already aware of the research topic which potentially introduces bias in the ranking making them more inclined to go for sustainability criteria. After that the most important criteria are the economic benefit for the consumer. When comparing the results of the MUT and the survey, the responses differ and lead to inconsistent conclusions.

Behavior in the establishment

Surprisingly, during the observations, not a single consumer asked for reusable tableware, nor did they ever bring their own. This raises the question whether they care enough about the matter. On the other hand, it was also observed that often the consumer did not have a choice in the type of tableware they receive, apart from whether it was for take-away or not. Even if the employees asked whether the consumption was on-site or for take-away, this was sometimes only an indication for whether the purchased food should be put in a bag but not necessarily an indication for the type of tableware handed out. In most cafés and restaurants, the only opportunity for the consumer to choose the type of tableware, was when having the option to take a plastic lid for a coffee cup, a stirrer, or a napkin. Then again, this is most likely

Figure 5. Dine-in tableware OFC-2.2

the norm, and these practices happen out of habit. The problem seems to be that there is not a strong enough reason to speak up or change these practices.

Additionally, with regards to recycling and the use of bins, consumers also had limited choice but at the same time acted contradictory to statements given. One specific location had bins for coffee cups, plastic cups and others. However, all the consumers observed at the time trashed their paper straws, which were inside the plastic cup, in the plastic bin. Whether this was the rule or not was not visible from the bin. Especially in the fast-food restaurants but also in one of the café chains, recycling bins were not available. These were also not available in cafés and bars, however, here the disposal of items (if there were any single-use items) was mostly done by the employees.

The key insights chapter 3:

- Consumers prefer reusables over SUPs
- Consumers often do not have a choice in choosing the type of tableware
- 70% of customers is prepared to bring alternatives in return for a discount
- 60% of customers is prepared to pay more for the use of alternatives
- Currently, there exists a poor recycling system for on-site consumption

CHAPTER 4 | Pulling the curtain

This chapter combines the previous chapters to analyze the stakeholder matrix of the Vesterbro region and the responsibility for reducing SUPs consumption. The Stakeholder Matrix is based on the results of material flow analysis (see chapter 1), interviews, consumer surveys and material user tests in Vesterbro. We divided the stakeholders into three categories: business owner, consumer, and the national government. This chapter analyses the reasons for each stakeholder's position in the matrix and concludes that both business owners and consumers believe that businesses should be more responsible for the reduction of SUPs.

Business owner

As shown in Figure 7, café chains and fast-food businesses have a high influence and lower interest in the reduction of SUPs. This is caused by their number of SUPs (Figure 1) and financial concerns to alternatives (see chapter 2). Larger and multinational companies have an additional operational barrier where any changes regarding their businesses needs to be discussed by the overarching management.

For café non-chain and bars, especially for café non-chain, they are generally small-scale and have a smaller customer flow than in chains; and according to our interviews, they have been providing reusable tableware (glass, ceramic and metal) for consumers who eat on site. Therefore, they have little impact on SUPs. The only difference is that most of the café non-chains have a higher interest in the alternative, while the bar/pubs are less interested in it. Compared to bar/pubs, café non-chains have smaller and a more stable flow of consumers and mainly use SUPs in take away; while bar/pubs have a higher flow of consumers and especially after 12 p.m., they need to provide take-away cups for consumers who have not finished their drinks for take away. Hence, SUPs are the best choice for them. Therefore, they have less influence on SUPs and have an easier decision on whether to use reusable alternatives.

Consumer

According to the results of the consumer survey in Vesterbro, 89% of people are interested in alternative plastic, and 76% have their own alternatives (basically reusable cups and straws), indicating that the overall awareness of environmental protection is high. However, in terms of consumption behavior, less than 4% of people will deliberately choose to go to bars or cafes that allow the use of their own reusable tableware, while 48% of people are willing to go but will not actively seek it. Consumers believe that if an alternative is used, the environment is the primary consideration, therefore, they have high interest in Figure 7. Although they are the main group using SUPs, this is not an active behavior (mainly led by business owner), so their influence on SUPs is medium in Figure 7.

Government

Although there is no interview about the role of municipality in Vesterbro region, their role has been mentioned during interviews with business owners. In the eyes of the business owner, the municipality has a high influence through the implementation of policies.

Responsibility

Who is more responsible for reducing the use of SUPs? Our results show that most of the stakeholders believe that the business owners have the highest responsibility. Consumers believe that the tableware they use is provided by them so that they have limited options. In the interview with business owners, one of café managers said, "*restaurant should take more responsibility*" (C-2.7). A bar manager said: "a lot of these cheaper bars and nightclubs could benefit a lot from thinking a bit more about what it is they're buying, and what it is they're using to serve their customers" (BAR-2.3).

Interestingly, the government is not seen as the primary responsibility bearer, and it is often assumed that reducing the use of SUPs is an individual responsibility.

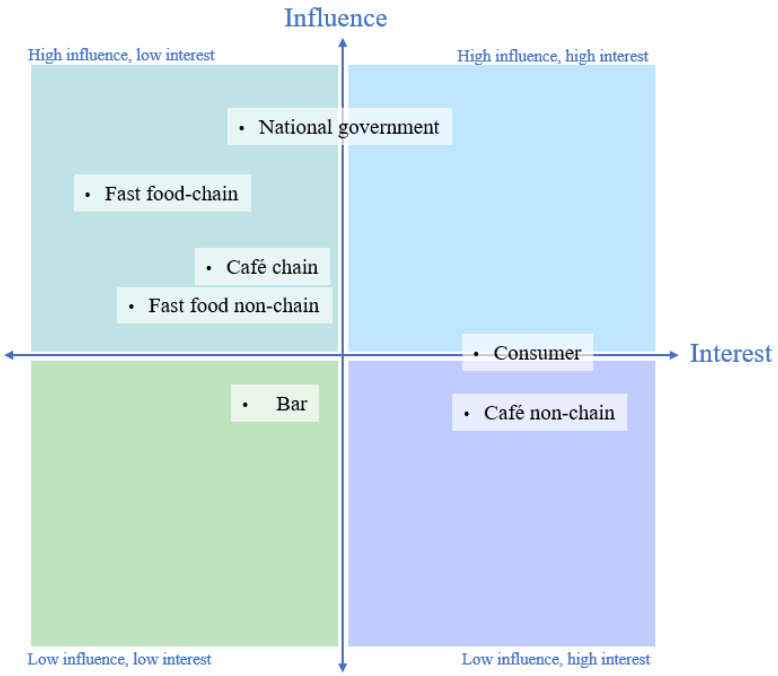

Figure 7. stakeholder matrix in Vesterbro. This graph is based on a combination of MFA's statistical results, questionnaire and interview results.

The key insights chapter 4:

- The business owners are perceived to have the highest responsibility
- The government has the highest influence, however the stakeholders do not consider them the main responsibility bearer
- Consumers have the highest interest in using alternatives to SUPs

CHAPTER 5 | Transfer at the Train Station

The Copenhagen central station is a place in Vesterbro that connects and transfers passengers to new destinations. In the same manner we are looking into ways to move into new sustainable practices within the hospitality sector. The phase-out of SUP tableware is a wicked problem that has increasingly received attention from business owners, consumers, and other relevant stakeholders. The end goal is to have a hospitality sector in which plastic is disregarded and reusable tableware is the norm. This chapter explores several factors that influence this switch. Here, we present best practices and attitudes towards a plastic-free sector by focusing on possible alternatives.

Convenience

As discussed in the previous chapters, most decisions by consumers are made based on what is available and only a small percentage is willing to put in more effort to create a sustainable option for themselves. For the business owner it is important that the reusable tableware does not cause an excessive increase in time, energy, and money that they need to spend on operating their business. This leads us to conclude the importance of the 'convenience factor'. In the current situation, SUPs have a high convenience factor. They are cheap, functional, safe, and easy-to-use for customers and business owners. With the right implementation of reusable alternatives in combination with behavioral change from both sides, and the supporting infrastructure in the establishment; we can increase the convenience of reusable alternatives and indirectly decrease the one of SUPs.

Green image

With the current green trends and an environmentally conscious population in Vesterbro, establishments must consider meeting sustainable demands for their customers. A business owner pointed out that "*it is good for the brand to get a green image*" FFC-2.1 refers to switching to reusable tableware. From this statement it appears that there is a willingness among the business owners to become more sustainable shows that it reflects positively on their business image. Not only do business owners want to uphold this image for their customers, but they also believe that being sustainable is the right thing to do (CC-2.1., C-2.1, C-2.2, C-2.8).

Legislative ban of SUPs

To depart from the current practices into a new destination it is of utmost importance that legislative actions are taken. These actions can range from the local level (municipality) to the supranational level (EU). Essentially, there should be a mechanism to regulate the supply and demand of reusable tableware and to limit or ban SUPs followed

by negative and positive incentives. For example, authorities can provide a green tax refund to business owners that face financial issues with the increasing energy or water cost after switching to reusable tableware.

Additionally, the steps to completely ban SUPs must be in accordance with the existing availability of alternative options. Establishments have to be able to make the switch, thus they need to have access to the supply of alternatives and they need the financial resources to do so. The marketable product must take into account the consumer demand and the environmental criteria.

Single-use alternatives

The EU ban on plastic straws [v]has unleashed new practices that have introduced non-reusable options made from materials such as bamboo, algae or sugar cane. This shows that the availability of alternatives to SUPs at the time of implementing a legislative ban is not crucial because there is sufficient market driven innovation already. At the same time, current single-use alternatives do not completely satisfy customers or business owners. Innovative materials are frowned upon but are accepted as the "lesser evil" (C-2.1, BAR-2.3, C-2.3). For now, it is not only important to highlight and acknowledge best practices to replace SUPs exist but to also understand that the demand for better alternatives exists.

Back to basics?

When looking at all the shortcomings of new single-use alternatives another question arises: Why don't establishments go back to basics and use traditional tableware? For some business owners using traditional tableware was self-evident and did not understand why they would use SUP. However, we quickly became aware that this is not a realistic option for many business owners.

To use alternatives to SUPs, installation of additional devices for cleaning purposes and enough space to store the reusable items may be needed. Some factors are the size of functional area, business model (focus on on-site or take away) and type of food/drink/snack served.

When the space is limited a business model where a discount for bringing your own cup is used can be implemented to reduce the on-site burden for cleaning and storage. In this way, consumers are incentivized to think about bringing their own cup and businesses do not have to take care of the dirty cups. Another option would be to introduce a refund system and collaborate with companies that offer these services (e.g., Billie Cup, ReBowl, KleenHub). This allows the customers to take away their order in case they want to leave the establishment. Such systems are not limited to cups as they also offer alternatives to food containers.

The key insights chapter 5:

- The switch to the alternatives options must consider the aspect of convenience, (physical) infrastructure, and needs to be driven by regulations
- Legislative ban on SUPs leads to new innovations regarding reusables
- Using reusables reflects positively on the image of the business
- Using traditional tableware is the solution against SUPs for some business owners, but not for all

Conclusion

The results of this report about our study area can be formulated into the following key insights:

- There is an overall shared sense of responsibility among businesses and consumers
- Consumers prefer reusables over SUPs
- The current recycling system in establishments is currently insufficient
- Business owners are perceived to have the highest responsibility and the government the highest influence
- The legislative ban on plastic straws has triggered the implementation of new reusables and stimulated creativity from the business owners.

The main barriers that prevent change are the lack of awareness, convenience of the use SUPs and the availability and hygiene concerns regarding the use of alternatives.

To answer the research question of this geo-report, we created Table 2. This table shows the identified barriers to and enablers of a legislative ban on single-use-plastic in Vesterbro.

Table 2. *Barriers and enablers of a legislative ban on single-use-plastic in Vesterbro*

<table>
<tr><th>Barriers</th><th>Enablers</th></tr>
<tr><td>Lack of awareness about the use of SUPs</td><td>Shared sense of responsibility from the consumers and BO</td></tr>
<tr><td rowspan="2">Perceived investment and operation costs of alternatives</td><td>70% of customers is prepared to bring alternatives in return for a discount</td></tr>
<tr><td>60% of customers is prepared to pay more for the use of alternatives</td></tr>
<tr><td>Convenience of using SUPs</td><td rowspan="2">Alternatives are preferred over SUPs by customers in terms of experience</td></tr>
<tr><td>Hygiene and food safety concerns (aggravated by the COVID pandemic)</td></tr>
<tr><td>Availability of high quality and affordable materials for alternatives</td><td>Legislative ban on SUPs (plastic straws) has led to new innovations for alternatives</td></tr>
<tr><td>The scale and management of chains differ from individual businesses, making it harder to implement change</td><td>Negative connotation on SUPs and a Green image related to the use of alternatives</td></tr>
</table>

Annex 1. Estimated Single Use Plastics

The table 3 on the next page presents the number of SUPs and consumers that were obtained from the field observation in all categories. Two samples were identified from each category to assess the general type of SUPs and also other typical SUPs that were found during observation. From these data, the average SUPs per capita can be determined using following equation:

$$Average\ SUPs\ per\ capita = \frac{Number\ of\ SUPs\ observed}{Number\ of\ consumers\ observed}$$

The results were computationally ranked with color to which samples has the highest until the lowest of SUPs consumption. Red color indicates high SUPs usage, yellow indicates average SUPs usage and green represents the least.

The results in table 3 were used to estimate the total SUPs in Vesterbro. The calculation used is the same as in the synthesis report. It considers the population (residence and tourist) and the frequency of visits to the establishment.

Table 3 Amount of SUPs usage on-site in observed samples in Vesterbro.

	FF Chain			FF Non-Chain	Café Chain		Café Non-Chain		Bars/Pubs	
Name of Restaurant/cafes	OFC-2.2	OFC-2.3	OFC-2.1	OFF-2.1	OCC-2.1	OCC-2.2	OC-2.2	OC-2.1	OBAR-2.1	OBAR-2.2
Plastic wraps	0	24	37	6	7	-	-	-	-	46
Utensils	0	-	6	0	-	2	-	-	-	-
Straws	0	1	0	5	-	-	0	-	-	-
Storage mayo-sauce containers	10	12	30	4	-	-	-	-	-	-
Cups	8	0	35	0	10	8	2	-	-	20
Cup lids	0	0	0	0	10	2	1	-	-	-
Stirrers	0	0	0	0	-	-	-	-	-	-
Plates	0	0	0	0	-	4	-	-	-	-
Drink bottles	0	0	26	0		6				2
Food boxes	0	0	21	0						
Ice cream	0	0	9	0						
Other (SUPs)	0	12		1	1	1	4	-		
Number of consumers observed	12	20	45	9	14	14	30	4	130	59
Total number of SUPs observed	18	49	164	16	28	23	3	0	0	68
Average SUPs per capita (consumer)	1.5	2.45	3.64	1.78	2	1.64	0.1	0	0	1.15

Note: Not available in the establishment (-), Available but not being found during observation (0)

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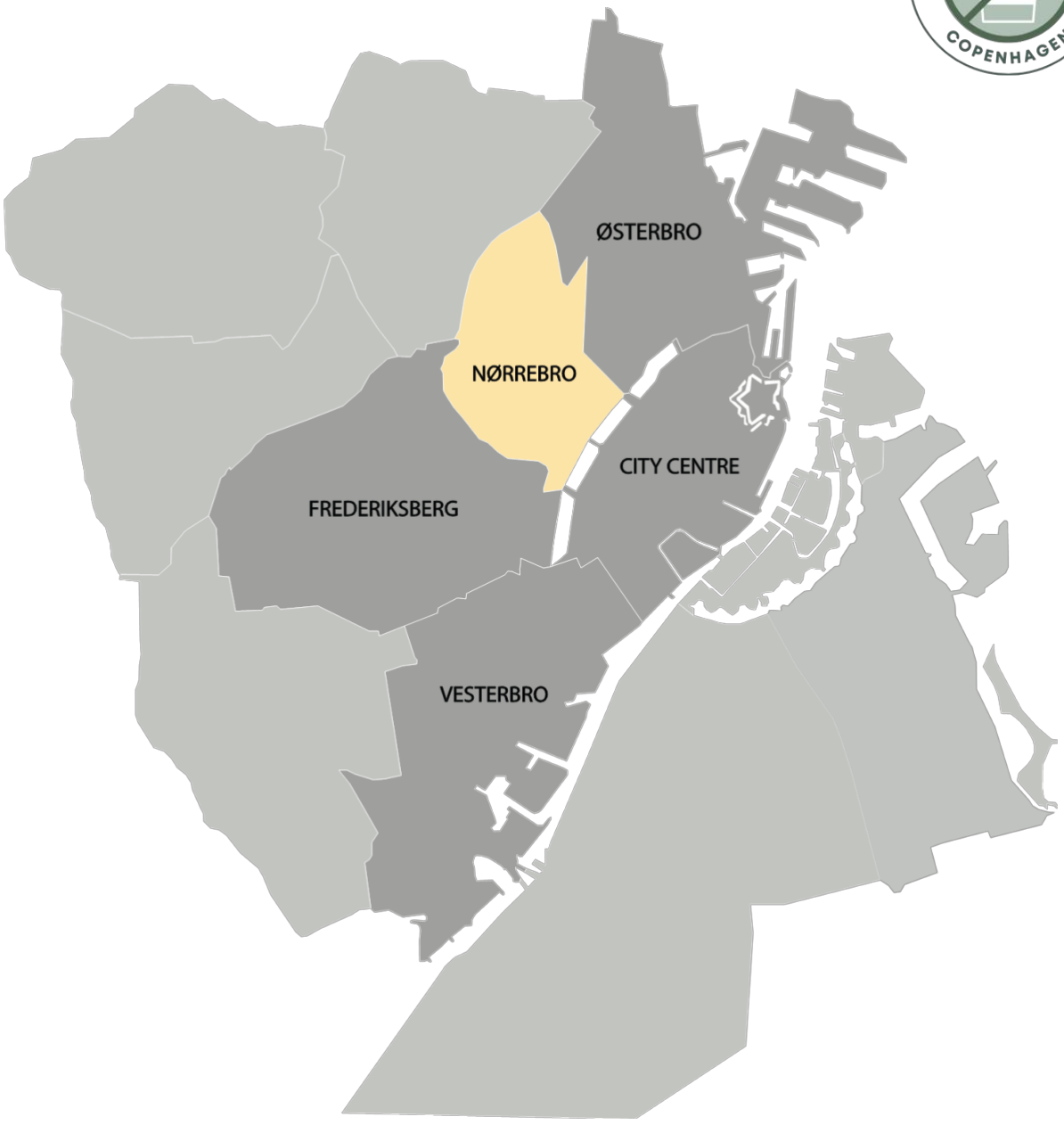
KØBENHAVN # NØRREBRO og NORDVEST

GEO REPORT 3



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European Workshop – ESA31306

TABLE OF CONTENTS

CHAPTER 1 | Introduction

This GEO report is part of an interdisciplinary research project of Wageningen University & Research that looks at the use of single-use plastics (SUPs) in the hospitality sector in Copenhagen. The project is commissioned by Oceana, an international environmental non-governmental organization (NGO) dedicated to reducing plastic pollution in the ocean. The overall aim was to gain greater insight into the current situation about the use of SUPs by identifying barriers and enablers for reducing the use of SUPs in Copenhagen by conducting various analyses.

1.1 The diverse district of Nørrebro

This report is dedicated to the district of Nørrebro, meaning "northern bridge". The development of the Nørrebro started in the mid-1800s with the migration of people from the crowded Old Town of Copenhagen and the migration of people living in the countryside to the capital.[1] In 1852, Nørrebro was formally established as one of the ten districts of the capital city of Denmark and has a surface area of 3.82 km^2.[2]

Nørrebro is a unique multicultural district in Copenhagen with the highest population density in the city (18,500 people per km^2)[3]. Originally, Nørrebro was inhabited by the working class. From the start of the industrial revolution, many immigrants found their way into the district mostly coming from countries with a Muslim majority population[4]. The availability of affordable housing was the main driver for the current diversity in the neighbourhood, attracting countless starters, students and immigrants.[5] It became so popular to move to Nørrebro for immigrants that in 2009 almost 30% of the district's inhabitants were either first- or second-generation immigrants.[6] In addition to the financially disadvantaged who were attracted by the cheap housing prices, the region is nowadays also clustered with people who have decent incomes and are well-educated, comprising young left-wing oriented creatives and starters.[7]

The Time Out named Nørrebro 'the coolest neighbourhood' in the world in 2021.[8] As such, there is no substitute for the uniqueness of Nørrebro, as diversity and social cohesion that is clearly visible in the streets make the district a very diverse area in terms of immigration, politics, race, class, and religion. Diversity dictates that different and more targeted recommendations can be made in the face of the use of SUPs in Nørrebro. Both education and infrastructure development can provide a facilitative role for different groups of people and different places of consumption. This poses an additional challenge for policy makers, as addressing issues such as plastic waste management, can be a controversial process when trying to meet everyone's diverging needs.

1.2 Problem statement

Plastic pollution was first discovered in the oceans in the 1970s, but by now plastic pollution in the marine environment has become a widespread problem.[9] SUPs are the biggest source of marine pollution in the world with consumption levels continuing to increase. In Copenhagen there is an increasing demand for take-away food consumption, resulting in an increased use of SUPs, primarily being food containers and to-go cups.[10] There are existing alternatives for SUPs, as well as awareness around the alternatives. However, social, political, and economical barriers prevent a change in practices. Among the Danish consumers there is a willingness to shift practices, thus the challenge lies in researching these barriers to find suitable solutions.

Diversity also poses risks to local SUP use in Nørrebro. First, the traditional fast-food industry and the sale of kebabs and falafel in the Nørrebro region have greatly increased the on-site SUP usage. Because of the high customer volume in these traditional and non-traditional fast-food restaurants, business owners usually choose disposable plastic tableware for hygiene and efficiency purposes. Furthermore, the diversity of Nørrebro's ethnic groups result in differences in the degree of residents' concern for environmental issues. According to the survey and research, young people in the Nørrebro have a greater interest in and concern for environmental issues. Whereas some immigrants and older residents stated to be less concerned about

environmental issues (CS-3). Although this discrepancy in perspectives could pose a risk to the decrease of SUPs in Nørrebro, at the same time it could be an opportunity for change. In this research we aim to get more insight into the diversity in Nørrebro and how this can lead to collaboration and co-creation of innovations regarding the reduction of SUPs in the district. In order to do so, we came up with the following research question:

What are the location-specific barriers and enablers for the reduction of on-site consumption of SUPs in Nørrebro, Copenhagen?

1.3 Methodology

In Nørrebro we conducted 12 interviews and 2 surveys with business owners to gain a better understanding of their perspective on the use of SUPs in Copenhagen in the hospitality sector. 10 observations of business owners and their establishments were done to get more in-depth insight in underlying meanings of verbal and non-verbal communication. Furthermore, 8 interviews with other stakeholders such as NGOs, policymakers, waste companies, alternative suppliers and business associations were conducted to gain a more holistic view on the barriers and enablers for more general stakeholders of Copenhagen. During the fieldwork in Nørrebro, 134 consumer surveys were distributed. Nearly 80% mentioned they were Copenhagen residents, so the results are representative of Nørrebro. Meanwhile, participant observation was conducted in 10 establishments, to get insight into the daily practices of consumers using SUPs in Nørrebro's hospitality sector. Lastly, we carried out 20 material user tests to get a better understanding of consumers' criteria and preferences for tableware for on-site consumption in establishments. For the user test participants were required to rate four different tableware sets and asked to explain their choices.

To analyse and estimate the total number of SUPs used in Nørrebro, the following method has been employed. Based on the consumer observations we estimated the average number of SUPs used per person during on-site consumption per different hospitality business category.

$$\text{Average SUPs per capita per one consumption} = \frac{\text{Number of SUPs counted}}{\text{Number of consumers observed}}$$

In addition, literature was used to acquire data on the population size,[11] and number of tourists visiting Copenhagen and Nørrebro more specifically,[12] in order to estimate the average number of people living in and visiting the area. Through analysing the surveys, we found information about people's habits, particularly regarding the visiting frequency in fast-food restaurants, cafés and bars/pubs. This information has aided us in creating the following formula to calculate the annual amount SUP items used per hospitality category in the district of Nørrebro. Finally, to reach the total amount of SUPs being used in Nørrebro, all categories' results are summed up.

$$\text{Pieces of SUPs used} = (\text{Category SUPs per capita}) x\ (\text{Population} + \text{Tourist}) \text{x}(\ \%\ \text{freq for each catergory}) \text{x}\ (\text{Times spent})$$

1.4 Roadmap & description of themes

The report consists of four chapters, all representing a theme that is distinct for the district of Nørrebro. Taking Nørrebro's unique diversity as a starting point, we discuss the barriers and enablers for reducing SUP usage in Nørrebro, Copenhagen. The first chapter, "From Café to Kebab: discovering diverse business-owners", will highlight the current situation and perception of businesses owners in Nørrebro regarding SUPs and alternatives. The second chapter "Can Consumers Change?", describes the current consumer view on SUPs and how this relates to their daily practices surrounding the same topic. In the third chapter, "The Power of

Policies", the influence of national and local politics on SUP use in the hospitality sector of Nørrebro will be discussed and what the consequences are for local businesses. Lastly, chapter four "Rethinking Recycling", will describe possible alternatives and opportunities for changing the status quo in Nørrebro regarding SUP use.

To create a better understanding of the relevant stakeholders for SUP usage in the hospitality sector in Nørrebro, a matrix is provided in Annex 1. The stakeholders have been ranked according to their level of interest and influence based on collected data. Throughout the themes we will elaborate on where and why particular stakeholders were placed in a particular area on the matrix.

CHAPTER 2 | From Café to Kebab: discovering diverse business owners

The diversity in Nørrebro is reflected in the multitude of hospitality businesses visible in the streets. In this chapter, we will discuss differences in SUP usage in various hospitality categories. Furthermore, the business owner perspective on the current and future state of SUPs will be highlighted. We will explore various misconceptions surrounding the topic and discuss enablers and barriers to change to alternatives from a business owner perspective.

2.1 Current SUP Situation in Nørrebro

The consumer observations allowed us to estimate the average number of SUPs used per consumer during an on-site consumption in different hospitality business categories in Nørrebro. *Figure 1* shows these results. The most noticeable outcome is that during on-site consumption at a fast-food chain, the consumer uses more than double the number of SUPs compared to other hospitality categories in Nørrebro. In addition, an estimated total amount of 12,8 million SUP items is being used per year during on-site consumption in Nørrebro. This was done using calculations which are elaborated in the methodology section. *Figure 2* depicts the total amount of SUPs consumed in Nørrebro, divided in five different categories.

	Nørrebro	Copenhagen
Fast Food chains	1,53	1,82
Fast Food no chains	0,64	0,75
Cafe chains	0,39	1,32
Cafe no chains	0,27	0,27
Bars/Pubs	0,44	0,31

Figure 1: Average number of SUPs used per consumer during an on-site consumption in the Nørrebro district, compared to Copenhagen overall. Data collected during direct observation in establishments (OBS).

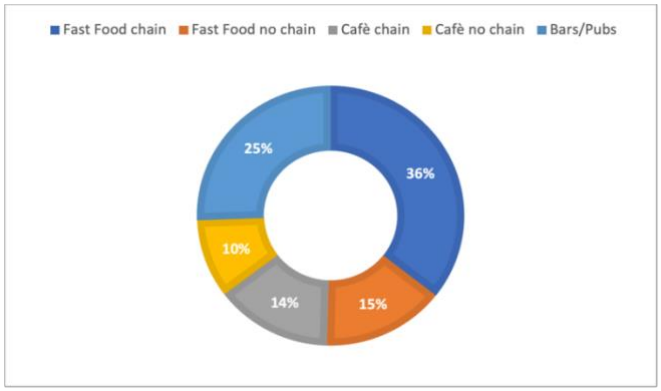


Figure 2: Total amount of SUPs consumed per year in Nørrebro, Copenhagen. Divided into five hospitality business category.

2.2 Comparing SUPs

As *Figure 1* shows, the situation in Nørrebro is slightly different from the average of the entire city of Copenhagen. In café chains, the observed average number of SUPs per consumer was notably less in Nørrebro

compared to Copenhagen. Furthermore, there is a slight reduction in the values of all categories except bars/pubs. This might be caused by the usage of paper straws that contain a plastic lining.

The total estimated amount of 12,8 million SUPs per year depends largely on the district's population size and attraction of tourists. This means that the estimated amount might vary slightly due to the movement of people within Copenhagen. The total amount of SUPs in the other areas analysed in Copenhagen is 95,7 million items. The district of Nørrebro is responsible for 13,4% of this total amount. Lastly, the analysis on the total amount of SUP items used has pointed out that about half of the amount of Nørrebro's SUPs are composed of plastic wraps and cups. This could be attributed to the many coffee chains that have a large take-away clientele and the vast amount of kebab shops wrapping kebab rolls in tin foil.

2.3 Misconceptions

The interviews were conducted across a diverse range of business owners, during which some contradictions regarding SUPs came to light. In order to implement a strategy to minimize SUPs usage, the misconceptions should be understood and will therefore be discussed as follows.

The terms '*recycling*' and '*reusing*' seem to be confusing for many business owners, specifically with a non-European background. A logical explanation for this confusion is the Danish word '***genbruge***', which means both recycling and reusing. Some business owners say they reuse tableware while all they do is throw it in the recycling bin, adding to the existing confusion between both terms. However, it was not clear from our data if this was merely a result of a bad translation being the issue or in fact a lack of general knowledge around the difference between recycling and reusing.

Secondly, there is a lack of knowledge about the composition of **paper cups and containers**. Some business owners are not aware that there is a thin layer of plastic engrained in paper items. So, paper items are more difficult to recycle and require specific techniques to be properly recycled. Whereas currently, various business owners throw paper cups and containers into paper bins.

According to business owners with a non-European background, **Danish people are more environmentally concerned.** Therefore, they believe that the Danes are willing to pay a little extra for more sustainable alternatives. One of the statements that led us to conclude this is: *"One obvious thing about Danish people: they are very understanding people. It does not matter for them if the price is a bit more expensive because of the environment."* (FF-3.2) However, this perception is not completely in line with the results of the consumer survey and material user test. In the material user test that we did in Nørrebro, only a little more than half of the participants were willing to pay 5-20% more (see chapter **Can Consumers Change**).

The final misconception is that **SUPs are cheaper than reusable options**. Various opinions and views of business owners emerged in the interviews. Some business owners mentioned that alternatives were more economic in the long term while others expressed their worries about the costs. There are some business owners who are still not convinced that a short-term investment in reusables might lead to paying off in the long term. One statement that supports this was put forward by the owner of a non-chain fast food who said: *"I guess SUPs are not cheaper, but it's more efficient, because you just have to wash those things all the time."* (FF-3.3) For business owners who still have the resources to buy cheap SUP or SUP in stock, a short-term investment might not be feasible. It is important to note the investments might differ greatly for chains and non-chains, which may have led to this different opinion regarding investment costs.

2.4 Business owners and reusable alternatives

In addition to various misconceptions from business owners, we also asked about their opinions on reusable alternatives. Several criteria regarding alternatives are ranked in order to find out what matters to them when shifting away from using SUPs. The ranking of the criteria regarding alternatives can be seen in *table 1*.

Criteria	Average ranking
Durability of the reusable alternative	3,00
Less water needed to manufacture and re-use the alternative	4,60
Low investment costs for the business	4,80
Low costs for the customers	5,00
Low operating costs for the businesses to maintain the reusable alternative	5,80
How fast the alternative can be introduced in the market	5,80
Less CO2 emissions over the lifetime of the reusable alternative	6,00
Short time before investment is recovered	6,80
Business-owner experience when using the reusable alternative	7,40
Low health risk perception of the reusable alternative	8,00
Look and feel of the reusable alternative for consumers	8,80

Table 1: Results weighting criteria business owners (1 = most important, 11 = least important)

Based on *Table 1*, business owners in Nørrebro want an alternative that has high durability, as they gave this criterion the highest ranking compared to the other criteria. Besides that, business owners would consider different economic criteria to choosing an alternative product, such as investment, operating and consumer costs, and the immediacy of market introduction. Meanwhile, low health risk perception and look and feel for consumers were ranked as the least important by the business owners. The views from business owners on alternatives are quite interesting. Apart from cost and economic factors being the main criteria that are considered important, it is also because the low health risk perception factor is ranked low or considered least important. This could be related to the COVID-19 pandemic which resulted in a decrease in income. So, when switching to alternatives, the cost is still the most important thing. But what is quite surprising is that low health risk perception is considered less important than others, which contradicts the impact of COVID-19. The COVID-19 pandemic will be discussed further in the next section regarding barriers and enablers in using alternatives.

2.4.1 To switch or not to switch?

Some business owners in Nørrebro recently switched to reusable alternatives for single-use tableware. Others still have to make the switch, whereas another group never used single-use tableware at all. From this diverse range of business owners, we can learn what barriers and enablers exist to switching to 100% reusable tableware. Below an overview is provided of barriers and enablers identified in Nørrebro, Copenhagen. This will be elaborated on in the following sections.

Barriers	Enablers
COVID-19	Alternative Suppliers
Lack of Space	EU and Denmark's Policy
Hygiene	Long-Term Impact
Time	

Table 2. Barriers and Enablers of using alternative tableware for Business owners

One of the barriers for business owners to switch to using alternative tableware is the COVID-19 Pandemic. This issue was raised several times in interviews with business owners. Before the pandemic, the shift to reusable alternatives started to gain more substance. However, the pandemic reversed this shift and made health and hygiene a priority over sustainability. A consequence of the increased use of SUPs due to the pandemic and the constantly changing measurements has made a great impact on the current usage of SUPs in the hospitality sector of Nørrebro. In one of our interviews, a friend of a pub owner reminded him: *"You*

have it because of the Coronavirus. Remember that before, you didn't use it. You start to use it when you should close the place." He agreed by saying: "*The corona, basically what it did, it make everybody just use more plastic, if you know what I mean.*" (BAR-3.2) Currently, habits have returned to their old state influenced by COVID measurements regarding health and hygiene for both consumers and businesses. But in some places, personal coffee cups or other reusables are still not allowed for these reasons, whereas in other places like some vegan cafés this is encouraged by giving a discount. In addition, numerous places were observed to still be using SUPs, likely because there is still a lot of stock that must be spent or because it is not yet possible for the owner to switch due to costs.

The next barrier is the lack of space. For some restaurants or cafes that have a limited capacity, there is very little space to store alternative tableware or to place dishwashers. In contrast, large fast-food chains have more space but also need more reusable alternatives to be able to serve all consumers. This was stated by one of the cafe owners who said: ***"****One of the things we thought about was sourcing a way to have coffee plastic free. So, we didn't get them in coffee bags, but instead these stainless-steel containers with a circular system. But we don't have space for that right now. Space matters.* ***"****(*C-3.1)

The last two barriers are hygiene and time. Hygiene is important for every business owner, especially considering the COVID-19 pandemic. This makes business owners choose to still use SUPs that are directly recycled rather than reusable tableware that still needs to be washed thoroughly. Time acts as a barrier as tableware must be washed after it has been used. This is one of the biggest obstacles for most fast-food restaurants that already have a system in place. A statement from one business owner supports this***: "****Less SUPs means a trade off in other areas. You need water, hours, employees. So, depending on what one finds important, one will weigh its options.****"*** (FF-3.3) Like the business owners say, there must be a trade-off when switching from SUPs to reusable alternatives.

On the other hand, there are several enablers that can push the switch to alternative tableware. First of all, the existence of alternative suppliers. This makes it easier for business owners to find suppliers who provide alternative tableware. In addition, there are companies such as Kleenhub, which have provided a system for reusable alternatives for many cafés and restaurants.
The second enabler are the existing policies at both the national and EU levels. Policies that limit the use of SUPs can be an enabler for businesses. Because they don't want to violate existing policies, business owners have to turn to alternatives. Even so, a stricter policy is still needed, such as banning SUPs as tableware.

The last enabler is the long-term impact of reusables, both environmentally and economic. Using alternatives can be more sustainable and environmentally friendly. As for economic benefits, it can be more profitable because there is no need to buy stock of SUPs continuously. In Nørrebro, some business owners are choosing to switch and invest more in alternatives, while there are also those who have not yet switched, because they may still be hindered by the barriers mentioned above.

2.5 Mutual benefits for business owners in Nørrebro

The diversity of business owners in Nørrebro provides an opportunity for collaboration to minimize SUPs usage across the different types of establishments. Fast-food chains use the most SUPs per consumer and can learn from the fast-food non-chains, often owned by people with a similar ethnic background, that use less. Similarly, for cafés, small-scale cafés can share experiences to reduce plastic with the café chains. However, because of the social cohesion in Nørrebro, we support engagement of different people with varying demographics, so Nørrebro can act as a leading example in reducing SUPs by learning from each other. In addition, misconceptions regarding reusing and recycling, costs of alternatives, and willingness of consumers to change can be solved by more collaboration between the establishments and communication about SUPs and alternatives. In order to implement a reusable alternative for SUPs, the cost is a major consideration for

business owners who choose to use tableware with high durability. Barriers that must be considered before implementation are health and safety concerns, as well as space for storage and time to clean.

CHAPTER 3 | Can Consumers Change?

By looking through the eyes of the Nørrebro business owners we have gained a better view on the dominant perspectives of the hospitality sector regarding the use of SUPs in the district of Nørrebro. This chapter will give voice to the consumer perspective. First by focusing on our survey outcomes which indicate consumers' attitudes, preferences, and concerns that influence the use of SUPs in Nørrebro. Secondly, the insights of the material user test will be discussed to showcase consumer preferences for possible alternatives.

3.1 Consumers' Choices

More than 90% of the respondents in Nørrebro mentioned that they prefer on-site consumption when going to a bar, fast-food restaurant or café. Only for fast-food restaurants, respondents preferred to take-away instead of eating on-site. This is displayed in *figure 3* below.

When taking a closer look at the use of SUPs in fast-food restaurants in Nørrebro, it became clear that most tableware and packaging is in fact disposable (1,08 item used per consumer for on-site consumption). These were made of SUPs, paper and tinfoil packaging.

Figure 4 demonstrates the percentage of respondents' tableware preferences for on-site consumption in three hospitality categories in Nørrebro, Copenhagen. It is notable that only for fast-food restaurants, nearly half of the respondents (*N=134)* did not prefer reusable tableware, but instead either preferred SUPs/paper or they did not care. Main motivations for the former were convenience and hygiene. For the latter, convenience when suddenly deciding to take away was a key motivation, in addition to generally not caring what tableware they used or there was a lack of alternatives.

At the same time, as displayed in *figure 4,* 60% of the respondents would like to use reusable tableware in fast-food restaurants in Nørrebro. This was also the case for the other categories bars/pubs (84,68%) and cafés (92.37%). The main reasons given for this were sustainability, reusability (no waste), better for the environment and a more pleasant eating experience (mouthfeel). As we observed, most tableware used in bars/pubs and cafés is already reusable, which corresponds with the preference of the consumer. Only take-away consumers opted for a disposable option, as well as a single consumer for on-site consumption.

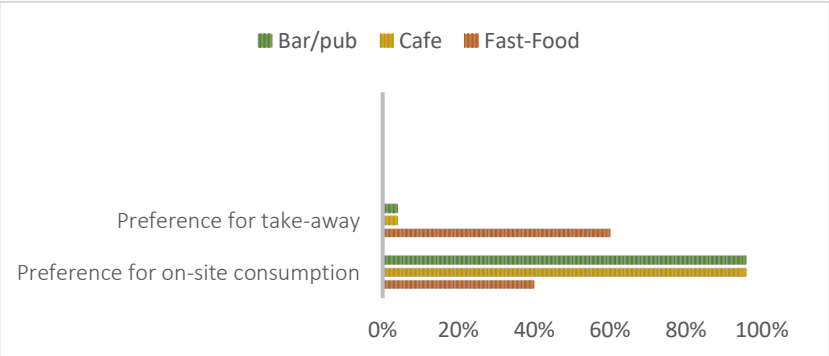
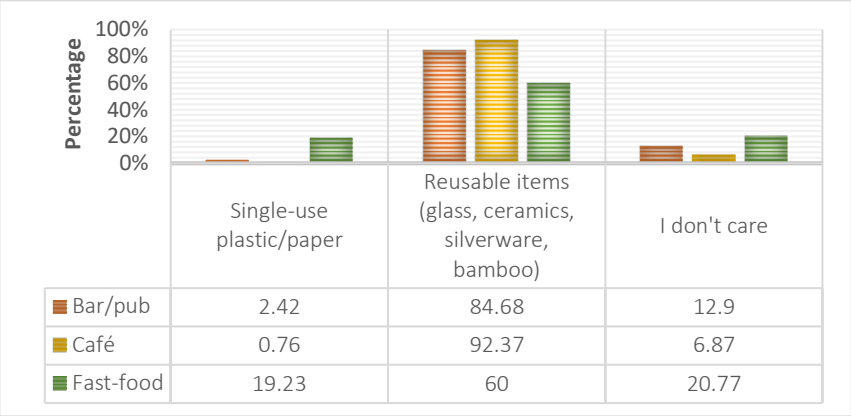


Figure 3: Percentage of respondents' preferences for on-site consumption vs. take-away in the hospitality sector in Nørrebro, Copenhagen. Source: (CS-3)



	Single-use plastic/paper	Reusable items (glass, ceramics, silverware, bamboo)	I don't care
Bar/pub	2.42	84.68	12.9
Café	0.76	92.37	6.87
Fast-food	19.23	60	20.77

Figure 4: Percentage of respondents' tableware preferences for on-site consumption in three hospitality categories in Nørrebro, Copenhagen. Source: (CS-3)

3.2 Concerned consumers

When asking consumers about their concern for the use of SUPs, we noticed that nearly 80% of the respondents expressed their concern about the use of SUPs, as is shown in *Figure 5*. More than half believe that the use of SUPs can have a negative impact on the environment. There are also some people who are concerned about health issues. This confirms our findings of *figure 4*, which indicate that the overall preference for tableware for on-site consumption are reusable items.

As is demonstrated in *figure 5*, nearly 80% of the respondents have no concerns about the use of alternatives in the hospitality sector in Nørrebro, however alternatives should be cleaned properly. The other 20% mentioned that hygiene was also a concern for them, especially in fast-food chain restaurants. Other factors, such as quality of the alternative item and eating experience (mouthfeel) were also mentioned.

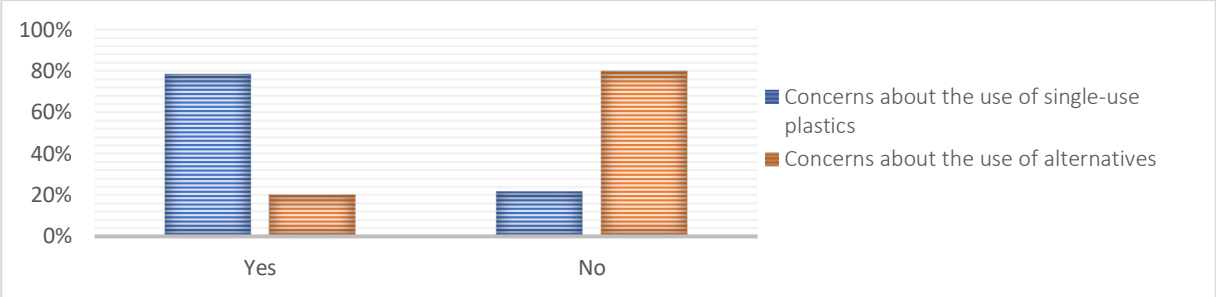


Figure 5: Percentage of respondents' concerns about the use of SUPs vs. alternatives in the hospitality sector in Nørrebro, Copenhagen. Source: (CS-3)

3.3 The consumers' experience

How do consumers in Nørrebro experience different types of tableware sets? The participants of the material user test (n=20) rated the traditional tableware set as the most preferred, followed by the reusable bioplastic (see *table 3*). After the reusable plastic set, the single-use set was by far the least preferred (see t*able 3*). Various reasons were given to motivate their choices. In general, the traditional set was the most preferred because it felt like home and was perceived as long-lasting. The reusable bioplastic set was liked because of the sturdiness, durability and the feeling. In contrast, the single-use set was least preferred because of the taste of wood, its disposability and being too weak to eat from. The reusable plastic set was also perceived negatively because it looked cheap, and it contained too much plastic. Notable was that no one mentioned hygiene as a determining factor.

Figure 6: Set-up consumer' preference experiment on SUPs and alternatives in Nørrebro, Copenhagen.

Remarkably, reusable and single-use were ranked close together in Nørrebro. Moreover, 25% of the participants mentioned the environmental impact of the different sets to explain their choices. Another 25% gave disposability or reusability as a motivation for the reusable option over the other. And 15% of the participants considered the number of times used as an important factor for their choice.

Tableware set	Single-use	Traditional	Reusable plastic	Reusable bioplastic
Detailed description	Paper plate, paper cup, wooden cutlery	Ceramic plate, ceramic cup, steel cutlery	Plastic plate, plastic cup, plastic cutlery	Bioplastic plate, bioplastic cup, bioplastic cutlery
Average ranking	3,45	1,35	3,15	2,05

Table 3 Material user test results from Nørrebro, Copenhagen (1 = most preferred, 4 = least preferred) Source: (MUT-3).

Based on the material user test, it seems that consumers in Nørrebro prefer to eat from a durable reusable tableware set. If the option is available, they would choose to eat from either a traditional tableware set or another sturdy and durable option which feels and looks nice. However, if the option is not available, most consumers will take little action to avoid using a disposable option. So, it seems like consumers can change in this regard, but it seems change in tableware should be made available by the establishments. If a business owner would make a switch to a reusable alternative, consumers will adjust and even be happy to.

The survey demonstrated that almost 80% of the respondents personally own an alternative reusable item, such as cups, straws, plates and lunch boxes. However, in ten observations, only one family brought reusable cups to a hospitality establishment (OBAR-3.1). In the material user test we noticed that half of the participants were willing to bring their own reusable tableware with them, whereas the other half would not. Moreover, 76% of the respondents mentioned they would be more motivated to bring their own reusable tableware if a discount existed (CS-3) Whereas 65% of the user test participants were willing to pay extra for their preferred set. The amount ranged from 5 to 10 Danish Kroner, or 5 to 20% knowing beforehand (MUT-3). This suggests that financial incentives may be the way to reduce SUPs use, whether that is paying more for an alternative or a discount to bring ones' own.

3.3.1 To reuse or single-use?

From the material user test we concluded that consumers in Nørrebro are willing to switch to reusable tableware. But what do consumers deem important when selecting a reusable tableware to replace SUPs? In the consumer survey (n=128), we asked the following question:

If all cafés and restaurants in Copenhagen would replace single-use-plastics with reusable tableware (e.g., bamboo, ceramic, reusable plastic), which of the following criteria would be most important to consider when choosing the reusable alternative? (See table 4 for results)

75% of the consumers ranked the environmental benefit of the reusable alternative as the most important. The economic benefit (e.g., cheaper than SUP option) for the consumers and the economic benefit for the businesses were ranked similarly and found to be the second most important. Consecutively, convenience of use by businesses and look and feel of the alternative followed in terms of ranking. Notably, the survey respondents and participants of the material user test differ in ranking the latter. In the user test, the participants made their decision mostly based on look and feel (MUT-3), while the survey respondents considered look and feel as one of the least important criteria. This suggests that consumers value aesthetics more in practice than in theory. If the alternative is ready to be used on a large scale, meaning it is already available on the market, was found to be least important by the consumers respondents.

Criteria	Average ranking
Environmental benefit	1,64
Economic benefit for the consumers	3,34
Economic benefit for the businesses	3,48
Convenience of use by businesses	3,89
The look and feel of the alternative	4,16
Alternative is ready to be used on a large scale	4,49

Table 4. Results consumer survey (1 = most important, 6 = least important) Source: (CS-3)

If a business owner in Nørrebro would like to implement a reusable alternative while keeping the consumer happy, he/she could take the discussed criteria into consideration. The business owner should make sure that the reusable alternative leads to an environmental and/or economic benefit in comparison to single use items. Furthermore, the aesthetic of the alternative is an extra benefit, which would trigger the consumer to opt for a reusable alternative.

3.4 Cash creates change?

Now we return to the main question for this theme: Can Consumers Change? Overall, the consumer population of Nørrebro is diverse in terms of culture and age, though there is unification in terms of environmental awareness. People are generally conscious of their negative effect on the environment when using disposable tableware and convey interest in becoming more sustainable individuals. This could be an opportunity for change in the district of Nørrebro regarding SUPs, by focusing the influence on switching to alternatives. Secondary factors that influence the switch to alternatives are (personal) economic benefits, aesthetics and feel of certain materials. Barriers for consumers to switch are mainly the availability of alternatives to disposable tableware. Fast-food restaurants are the main users of single-use items, and consumers are concerned about switching to reusables in these establishments, mainly for hygiene and convenience reasons. The Nørrebro population seems open to bringing their own reusables, as the majority personally owns an alternative item. In addition, when offered a discount, this willingness increases substantially. However, most consumers believe businesses should provide the alternative tableware option. Over half the consumers stated their willingness to pay slightly extra for a reusable alternative. Both these findings suggest that financial incentives might be a chance for reducing the use of SUPs in Nørrebro. However, it does not indicate that this will actually happen, as there seems to be a gap between consumers' attitudes and behaviours, which is largely fed by convenience and habits. To achieve an actual change in SUP usage in Nørrebro, more than a financial incentive will be needed.

CHAPTER 4 | The Power of Policies

4.1 Policies pushing business owners in a (un)sustainable direction

From a more local perspective within the Municipality of Copenhagen, the area of Nørrebro presents an interesting case to look at the effect of policy, given its high diversity in types of establishments. This was primarily observed in the business owner interviews, where the effect of EU and national policy became evident at a local scale for all establishments. Foremost, business owners pointed out the high level of influence that the increasingly stringent EU directive of SUPs has. For example, a bar owner states: *"it's going to be in the law it's forbidden to use plastic... if it is going to be a law then it is a law, you must follow it."* (BAR-3.2) Meanwhile another bar owner makes a similar comment saying: *"you just had to get rid of plastic because that's what the government said."* (BAR-3.1). From these statements it can be deduced that business owners are feeling the pressure and accordingly following the recently implemented new rules. Building on this, a fast-food restaurant owner mentioned more generally the need for establishments to conform with future regulations. Denmark's national 2030 target to reduce their carbon dioxide emissions was pointed out, where plastics are a large contributing factor as stated in the "National Plan for Prevention and Management of Waste 2020-2032".[13] Overall, the business owners conveyed a general sense of pressure being felt by the national policies limiting SUPs consumption because of the EU tightening demands.

As mentioned before, in contrast to these recently established legislations, influenced by the COVID pandemic of the last 2,5 years, multiple business owners mentioned that they are allowed by the government to finish their remaining stock of SUPs. As one of business owner stated: "*the government, they allowed if you have a little bit to finish it*" (…) "*You can use what you have from supplier.*" (FF-3.2). This concession provided by the government could be one of the factors why some places still use SUPs.

Regarding bar establishments, there is an additional national policy that somewhat contradicts Denmark's sustainability efforts to reduce SUPs consumption. As both interviewed bar establishments explained, for on-site consumption customers are given reusable glasses for drinking, which is generally seen among all bars in the area (BAR-3.1; BAR-3.2). However, there is a national policy in place that prohibits establishments from using glass cups after midnight for consumption happening on-site in outside (seating or smoking) areas. This is done in effort to limit the amount of broken glass on streets, given that consumers have been observed to often take their cups with them and not disposing them correctly. As a result, both interviewed bars noted that a lot of SUP cups are found littered across the city (BAR-3.1; BAR-3.2). Furthermore, one of the bar owners highlights the matter of responsibility establishments have, stating that the proper disposal of cups is no longer in their hands once consumers leave their vicinity (BAR-3.1). This applies for tableware of any material, although in the case of reusables, numerous establishments have a return system in place that gives customers money back as incentive to return used cups. Interesting to note is the responsibility aspect of business owners; they are held accountable for following the national policies in place, but this in turn does not hold hem liable for the (plastic) waste produced.

Based on the statement from the business owners above, it appears that they comply with the existing regulations, especially regarding SUPs. However, the current regulations are still not clear enough to reduce the consumption of SUPs in restaurants, cafés, and bars. Because of that, some places we observed and interviewed still use SUPs in on-site consumption and some of them have never thought about switching to alternatives.

Figure 7: Observed trash found on the street in Nørrebro, Copenhagen

CHAPTER 5 | Re-thinking Recycling by Focusing on Reduction and Reusing

The discussed EU directive is pushing countries to focus on reducing and reusing instead of recycling, while the latter is still the focus of Denmark. Given Nørrebro's high amount of diversity in culture, age, and types of people, there is a general open-mindedness that could present an opportunity for embracing this shift in focus for waste management. This section will focus on current recycling practices and give an assessment of possible reusable alternatives with some examples observed in the field.

5.1 All eyes on recycling

Nørrebro's hospitality sector comprises a diverse range of establishments that hold a limited availability of recycling services. The possibility for recycling ranges from no possibility for recycling at all, to providing only one type of waste bin. While some establishments have numerous recycling bins placed throughout their on-site area, they are limited by the type of waste sorting. Based on the observations made in different establishments, there is a general lack of recycling services in establishments that are distributing single-use tableware for on-site consumption. The observed recycling bins were only for the disposal of cans, with nonavailable for plastics (see *figure 8*; OFC-3.2). This limitation can largely be explained by the refund system in place in Denmark for cans, where a monetary incentive has been established for recycling them.[14] While there is also a deposit system is in place for plastic and glass bottles, no recycling bins for these products specifically were observed (OBS-3).

Figure 8: Recycling bin for cans found in fast-food chain in Nørrebro, Copenhagen.

Despite the sparse amount of recycling bins in place, we found through interviewing business owners that recycling is one of the topics that always come up when talking about waste management. As one of owners stated, "*the bottle you get in plastic everything we put them in one bag and recycle. Even the beer it's in plastic bags which recycle.*" (BAR-3.2) Another café owner mentioned, "*of course we have things delivered in boxes. Yeah, again, you save the boxes and recycle and everything in Copenhagen is recycled anyway. A lot of materials."* (FFC-3.2) The interviews thus came in somewhat of a contradiction to the observations carried out, as the business owners claim they do in fact recycle. There thus seems to be a discrepancy in the waste management being carried out behind the counter of establishments compared to the bins they provide for customers in on-site dining areas.

More generally there seems to be a high level of awareness around recycling in the Nørrebro area, and thus in line with the dominant discourse of waste management in Denmark. One of the café owners interviewed, showed appreciation for the initiatives taken by the Copenhagen municipality stating, "*The municipality does that here in Copenhagen* [providing recycling bin]. *It's awesome. We love that they provide that.*"(C-3.1) Another perspective of a fast-food business owner shows that recycling plastic could be a problem, "*The problem with the plastic, it's stuck in the machine. And it's made a lot of problems."* (FF-3.1) The various

statements about recycling above show how important recycling is in Copenhagen even though there are still some problems when recycling plastics.

5.2 Shifting away from recycling

In terms of change, we found that some restaurants, cafés, and bars in Nørrebro have started to shift away from tableware containing SUPs to alternatives that can be reused or easier to recycle. This applies to on-site consumption. Various reasons such as being more environmentally friendly and more economic, as well as improved consumer experience were given by companies to explain their shift to alternative tableware. Although a complete switch is still a barrier for many, for it requires extra investments, which might not be possible due to the heavy economic impact of the COVID-19 pandemic. In addition, another difficulty for business owners to switch in terms of tableware is hygiene. The shift from turning away of SUPs is not 100% yet, but the changes that have occurred are in the right direction. This can be a source of inspiration for both business owners in the Nørrebro area, policy makers, or even more broadly in society at large.

5.3 Introducing SUP alternatives

The introduction of SUP alternatives challenges waste management services in place as it requires a change in current infrastructure. Several interesting insights from the conducted business owner interviews came to the light when asking about their opinion on the hospitality sector and how they can contribute to becoming more sustainable in the future. One of the bar owners sounded very optimistic saying, *"Like they don't use it anymore [SUPs]? Yes, I am 100% sure about that, just give them [Denmark Government] a couple of years and that's it."* (BAR-3.2) A slightly less optimistic view by a café manager on the current situation mentioned, "*I definitely hope so. And I think so it requires a little bit more research and a little bit more work and probably a bit more money as well. But I hope just overall, when those solutions are gonna get a bit more common, they're gonna get a bit cheaper as well. So, it was going to be possible for every single one of us to make those changes (….) But yeah, I think it's possible to have to push people.*" (CC-3.1)

Further perspectives from business owners highlighted the difficulty of changing the current status quo on SUP usage in the hospitality sector. As one of interviews highlights, "*Like the everyday to-go cup is usually the one that trashes the most. You can see t if you just walk by public trash cans (....) And of course, also on the streets usually see a to-go cup from espresso house or someone."* (C-3.1) Similarly, another owner said*:* "*If you get Starbucks, it's automatic, as your plastic lid is. So yeah, I think generally, people can improve that, you know, you don't need to have plastic servers.*" (C-3.2) Lastly, an interesting statement from a fast-food restaurant owner showed that a sustainable future is achievable with some work, "*Yeah, it's a kind of a difficult one because like I suppose just running a business you try and streamline everything as much as possible. So, it uses as little amount of energy as possible and like the less we use of single use items, the less it costs us also, (….) in my brain, like cutting them out (SUPs), just saves money. People don't need them like you go out to a bar, you buy a beer comes in a glass. You don't really need any kind of single use plastic at all."* (FFC-3.1)

Generally, most business owners in Nørrebro seem to have similar perspectives about the possibility for the hospitality sector to switch away from SUPs. The alignment of views is particularly interesting given that they were provided by both a wide variety of different types of establishments, in addition to a diverse range of business owners in terms of age and cultural background. This can present prospect for conducive change to greater sustainability in the future, with diversity among actors still being united by the common goal of improving the environmental impact of the hospitality sector.

5.4 Reusing and reducing is cool

In the end, as mentioned above, recycling in Copenhagen and Denmark must be rethought. A bolder approach is needed to implement in every sector so that it can significantly reduce the level of waste. Some of the establishments are already trying to change and have made the shift towards alternatives. One particular café mentioned they were developing an edible coffee cup when looking for a sustainable alternative to the paper

to-go cup. He mentioned: "*there's no sustainable paper cup because it's all plastic lining. So, sadly, that's not an option yet. But for everything else that is to-go, we were also developing a waffle-based cup. (…) That was delicious to eat, this chocolate lined inside of your cup, it doesn't soak that much. But it wasn't perfect. So it soaked out in the cookie, but the cookie got a nice coffee flavour as well that way*". (C-3.1) Even though take-away is not in our scope, the idea might be implemented for on-site consumption and indicates the potential for innovation through creativity in the area.

The diverse and creative characteristics of Nørrebro could serve as an inspiration for all in the when looking at possible alternatives. Not only in Nørrebro, but on a national and global level as well. By focusing on best practices, creative and innovative ideas nurtured by the diversity and social cohesion in the district.

CHAPTER 6 | Limitations

This research has some limitations which have been divided into three categories. i) time and data availability ii) data collection methods for interviews, surveys and observations iii) data analysis.

I) Lack of available information on on-site consumption of SUPs refrained us from comparing our findings to existing data in other destinations. In addition, commuters between different districts of Copenhagen were not identified when estimating the total amount of SUPs usage per district because no available data can be compared. Time restraints regarding interview and survey preparations have limited this research by not being able to do a preliminary test on the questions. In addition, sample sizes of both survey and interviews are limited due to time constraints and willingness to participate, resulting in our data not being fully saturated.

II) Limitations regarding data collection will be discussed in three subcategories. 1) Interviews might be less accurate due to language barriers between interviewer and interviewee. All interviews were conducted in English, which was not the native language of many interviewed business owners. This might have influenced the quality, content and interpretation of the answers. In addition, lack of interview skills might have influenced the interview overall, resulting in inadequate answers for analyses. 2) The survey is limited by not including questions regarding personal values underlying practices and inaccurate questions on frequency of visits, causing biased estimations. Using a convenience sampling method, the results might not be representative and generalizable for the entire Nørrebro population. To illustrate, survey results show that more than 90% of the respondents were students and workers, and most survey respondents identified as female, indicating that results are more representative of these groups and not the whole Norrebro population. 3) Observations might be limited by time and place. There was only one observation conducted per selected establishment, often during the morning or afternoon. This might influence the results by not including certain peak moments around dinner time and possible different clientele. Only two observations per category in Nørrebro have been done, which is not enough to assure the reliability of the data collected. Also, it is not representative of the much larger quantity of fast-food non-chains in the area compared to other categories.

III) Limitations in data analyses relate to bias, as some approaches are of an interpretive nature or influenced by pre-existing perspectives and knowledge. In addition, lack of existing information made estimations based on less accurate or combining methods necessary, which might affect consistency. Also, not all weighting forms were filled out correctly, as a result, these weighting forms were left out of the data analysis, leading to a smaller number of data points.

CHAPTER 7 | Conclusion

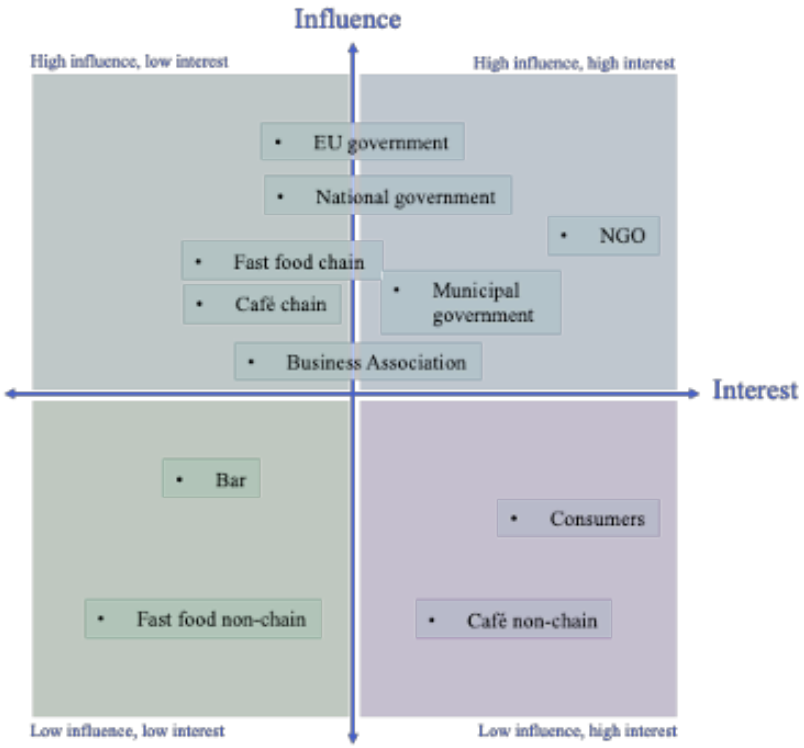
The aim of this report was to explore the location-specific barriers and enablers for the reduction of on-site consumption of SUPs in Nørrebro, Copenhagen. Nørrebro is characterized as a diverse district in terms of cultural backgrounds of residents and types of establishments, providing several opportunities. For instance, fast-food chains are the largest SUP users per on-site consumer and could learn from fast-food non-chains who use substantially less. Collaboration and creating more awareness could contribute to diminish the existing misconceptions regarding recycling/reusing, costs, and willingness of consumers.

Regarding a switch from SUPs to reusable alternatives, Nørrebro's business owners greatest concerns are durability and costs. Barriers such as the COVID-19 aftermath, space, hygiene and time, however, should be overcome. Availability of alternative suppliers, guiding policy and communication about long-term advantages could push them to switch sooner. Consumers in Nørrebro are likely to support the change. While diverse in culture and age, the consumers are environmentally aware which provides opportunities. When economic benefits, aesthetics and feel of materials are considered, most consumers in Nørrebro would not mind switching to reusable alternatives. Current barriers for consumers are mainly lack of availability of reusables in establishments as well as convenience issues when having to bring their own. Therefore, the consumers believe businesses should provide them with the tableware option, and half of them would be willing to pay a little extra.

Current policies regarding SUPs affect both business owners and consumers. A positive effect is the reduction of SUPs in the last year due to the EU Single-Use Plastics Directive, although this does not prevent the business owners to finish their stock, as is allowed by the government. A negative effect is the legislation which prohibits establishments to use glass after midnight resulting in increased SUP usage. While Europe tries to push reusing instead of recycling, the latter is still the focus of Denmark. However, the availability for recycling for consumers during on-site consumption seemed very limited. Most business owners in Nørrebro are aware of the problem of plastic litter, resulting in a general positive attitude to move away from SUPs. Some business owners already started with implementing creative alternatives, while others are open to change. The diverse, creative and environmentally aware characteristics of Nørrebro provide the perfect opportunity to be the first district in Copenhagen to make the switch.

ANNEX

Annex 1 Stakeholder matrix & table



A stakeholder matrix to represent the interest and influence relevant actors have towards the SUP issue.

Stakeholder	Interest	Influence
Fast food chain	Chapter 2.4	Chapter 2.1 - 2.2
Fast food non-chain	Chapter 2.4	Chapter 2.1 - 2.2
Café chain	Chapter 2.4	Chapter 2.1 - 2.2
Café non-chain	Chapter 2.4	Chapter 2.1 - 2.2
Bar/pub	Chapter 2.4	Chapter 2.1 - 2.2
EU government	Chapter 4.1	Chapter 4.1
National government	Chapter 4.1	Chapter 4.1
Municipal government	Chapter 4.1	Chapter 4.1
Consumers	Chapter 3.1 - 3.4	Chapter 3.1 - 3.4
NGO	Refer to synthesis report	Refer to synthesis report
Business Association	Refer to synthesis report	Refer to synthesis report

Listed stakeholders from the matrix and points of reference to the text that explains their level of interest and influence with qualitative data

Annex 2 Listings of SUP items & hospitality business categories

List of SUP's Items

- Plastic wrap
- Plastic utensils (fork and knives)
- Plastic straws
- Plastic storage (sauces or jam containers)
- Plastic cups
- Plastic bottles
- Coffee cup lids
- Drink stirrers
- Plastic plates

List of restaurants and cafés categories

Restaurant – Fastfood (non-chain e.g. kebab) : A fast food restaurant serves fast food and has minimal table service (often smaller) establishment. This includes shwarma/kebab places, fish & chip places, snackbar etc.

Restaurant – fast food chain : A fast food restaurant serves fast food and has minimal table service. To be considered a chain you have a minimum of 4 locations. They are either under shared corporate, private ownership or franchising agreements.Typically, the fast food restaurants within a chain have a similar architecture, standard menu and other services.

Cafés – Normal : Primarly serves coffee of various types, sometimes also cold drinks, including iced coffee or tea. A cafe may also serve food, snacks, sandwiches, pastries, fruit or muffins.

Cafés – Chain: Chain of cafés with a similar menu at all locations. Primarly serving coffe of various types, sometimes also cold drinks, including iced coffee or tea. A cafe chain may also serve food like snacks, sandwiches, pastries, fruit or muffins. For instance starbucks

Bars/pubs : An establishment that serves alchohol without the requierement of ordering food.

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KØBENHAVN

FREDERIKSBERG

SINGLE USE PLASTICS IN THE HOSPITALITY SECTOR IN FREDERIKSBERG, COPENHAGEN

Heleen Bruggink | Jimena Diamint | Aruna Ramdhan | Ruggero Orlando | Emma Verweij | Xiangkun Wang

European Workshop – ESA31306

Table of contents

Introduction

This consultancy report is written by master's students from Wageningen University & Research and commissioned by Oceana. The aim of this report is to research the single-use plastic (SUP) problem for on-site consumption in the hospitality sector in the autonomous municipality of Frederiksberg in Copenhagen, Denmark. We researched Frederiksberg consumers, businesses, and a representative of Frederiksberg's municipality to identify the current scope of the SUP issue and the main barriers and enablers to phasing out disposable plastics.

Single-use plastics are, currently, one of the greatest concerns relating to plastic pollution in the oceans[1]. When these plastics are disposed of, around 60% to 80% will end up in the ocean, littering the marine environment and threatening marine life which ingests these plastics or gets entangled by them[2]. Microplastics deriving from the degradation of plastic can be particularly harmful to the health of marine and consequently human life through the food chain[2]. The European Union has put forward the 2019 EU Single-use Plastics Directive that aims to ban some types of plastics and diminish the amount of plastic produced and consumed, where 50% of the plastics regulated are SUPs[3]. Until July 2021 every EU country had to transpose the EU Directive into their own national laws, by adapting it in a relevant manner (Rethink Plastic Alliance). The Danish national government has been under criticism for not going beyond the minimum requirements of the Directive. They did not seem to be particularly willing or ambitious to implement stronger measures or impactful targets to curb single-use plastic consumption and its waste on the Danish environment[4].

We will investigate the Danish single-use plastic problem in Copenhagen, focusing on the district of Frederiksberg, conducting detailed research to discover the unique characteristics that relate to the consumption and perceptions of SUP and reusable alternatives to it.

About Frederiksberg

Technically speaking, Frederiksberg is not part of Copenhagen. Frederiksberg is an autonomous municipality operating independently from the Copenhagen Municipality[5]. Where many other districts in the City of Copenhagen offer must-see tourist attractions, Frederiksberg is predominantly a residential area[6]. With its 103.608 inhabitants as of 2022, Frederiksberg is one of the most densely populated districts in Copenhagen[7].

As one of the most affluent residential districts of the City of Copenhagen, Frederiksberg is notorious for its green spaces, grand architecture and fine dining[8]. The neighborhood has a relatively small number of fast-food restaurants, mainly fast-food chains, some café chains, many classical restaurants and non-chain cafés. Moreover, Frederiksberg is known for its educational institutions, such as Copenhagen University, the Royal Danish Academy of Music, and the Business School[9]. These residential characteristics of the district translate itself into an area where its residents are socializing in cafes, bars and restaurants, enjoying leisure time by shopping at Falkoner Allé, or relaxing in the greenspace of Frederiksberg Have.

Despite of Frederiksberg being often referred to as 'The Green Heart of Copenhagen', its 'green' practices and habits regarding the on-site consumption of Single-Used Plastics (SUPs) in cafés, fast-food restaurants and bars are still an issue. According to our analysis, around 27 million SUPs are consumed in fast-food restaurants, cafés and bars/pubs in Frederiksberg per year, a number that is above the Copenhagen average of 19 million SUPs.

Roadmap for the report

This report presents the insights collected from the SUP issue in Frederiksberg divided into four interconnected chapters. Chapter 1, "Takeaway is a bad influence for on-site SUPs" enlightens the detrimental relationship between on-site consumption and takeaway, presenting the aspects of businesses contributing the most to SUP consumption. Following the high number of SUPs, chapter 2 "Single-used Perspectives" investigates how

convenience is a major factor explaining the decisions of businesses to prefer SUPs over reusable tableware. Chapter 3 "The Green village of Copenhagen" demonstrates that although environmental awareness is present in the district, the lack of communication between businesses and consumers is a reason for not translating opinions into actions. Finally, in chapter 4 "Ready, Set, Inaction" the responsibility for tackling the SUP issue are illustrated with the aim of explaining the current situation of inaction. At the end of each chapter the section "In a nutshell" summarizes the main points of all the chapters.

Methodology

The scope of this research includes five different categories in the hospitality sector: fast-food chains, non-chain fast-food restaurants, café chains, non-chain cafés, and pubs/bars. A more elaborate description can be found in annex 1.2. Traditional restaurants were purposefully excluded since we found they did not use a substantial number of SUPs for on-site consumption. Furthermore, a distinction between different types of single-use plastics was made to demarcate the scope of this research. The list of SUPs can be found in annex 1.1.

All the data was collected inside the bounds of the district by 6 researchers, during 7 days of fieldwork. The data collection methods used are described below.

Table 1 The description of the data collection methods

Data collection method	Number	Details
Semi-structured business interview	9 businesses (2 café chains, 1 fast-food chain, 2 café non-chains, 2 fast-food chains, 2 bars)	In-depth interview with business owners in Frederiksberg. If the business owner was not present, the interview was conducted with the manager or employee.
Semi-structured interview with the Municipality of Frederiksberg	1	In-depth interview with an employee of the Municipality of Frederiksberg.
Businesses survey	7	Online survey shared with businesses when not willing to do an interview.
Consumer survey	198	Shared with consumers with a QR score, to be scanned with their phone.
Participant observation	11 (2 café chains, 2 fast-food chains, 2 non-chain cafés,2, non-chain fast-foods, 1 bar)	Sat in the establishments as a client and observed the consumers, the establishment and the SUPs consumed.
Material user test	20	Consumers tested 4 different types of tableware made of different materials (disposable paper, reusable plastic, reusable bio plastic, traditional ceramic and metal) and ranked them in order of preference. This was done in two different locations.

CHAPTER 1 | Takeaway is a bad influence for on-site SUPs

While the on-site consumption of SUPs is the focus of this report, we cannot ignore that takeaway service is a major contributor to their presence on the on-site consumption in the hospitality sector in Frederiksberg. Café and fast-food chains that have a takeaway as a big part of their business model also presented the highest average of SUP items per consumer. Interestingly, the café chains that made a distinction between their takeaway and on-site service presented significantly lower numbers of SUPs on-site. Such a distinction relates to what choice the customer is offered when ordering. If they can choose between different types of tableware, data showed that in those establishments fewer SUPs will be used. In this chapter, we will analyse the reason for the negative influence that takeaway service has in relation to on-site SUP consumption.

Takeaway and chains can be synonyms for large numbers of on-site SUPs

The fast-food and café chains in Frederiksberg present, on average, the highest number of on-site single-use plastic items per consumer. Café chain and fast-food chain consumers use, respectively 2 and 1.4 SUPs items on average, which contrasts with the other categories (fast-food non-chain restaurants, cafés non-chain and bars) that stay below the mark of 1 SUP item per consumer. Figure 1.1 shows the average number of on-site SUP items per consumer for the different researched categories of the hospitality sector in Frederiksberg.

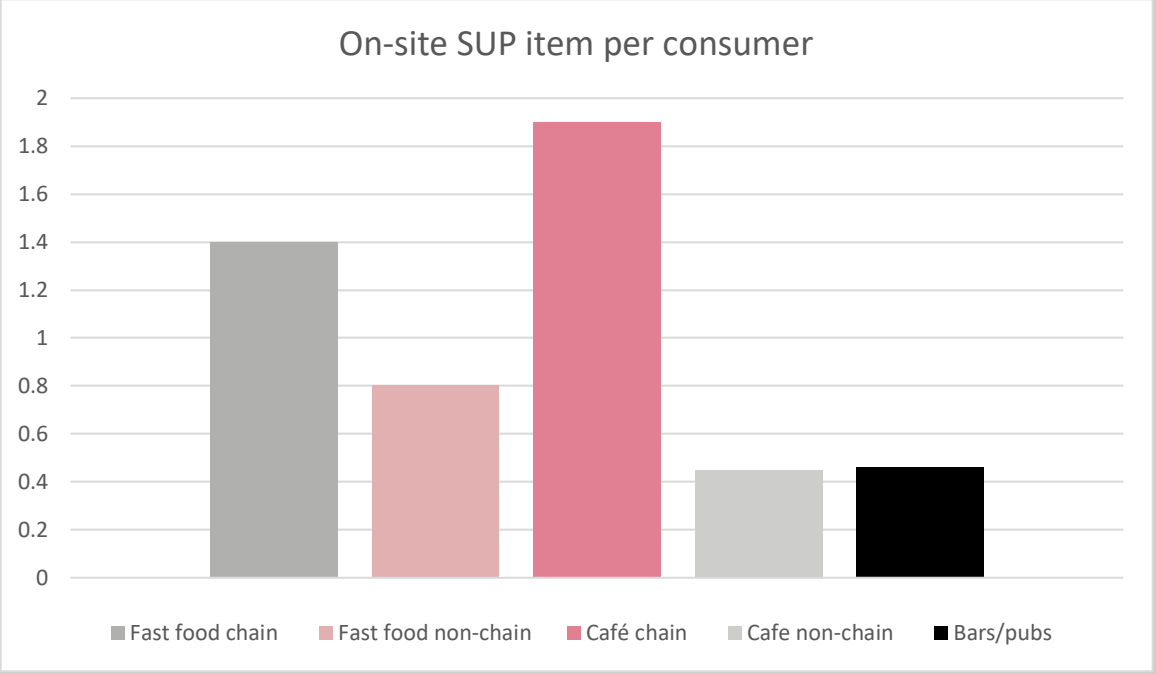

Figure 1 .1 Average number of on-site SUPs per consumer per category in Frederiksberg, Copenhagen.

The fast-food and café chains observed all rely on takeaway as a big part of their business model, while still catering for on-site consumption. What characterizes these chains is the little to no table service and the orders made on the counter, to be picked up by the consumer (OFC- 4.1; OCC- 4.1; OCC- 4.2). These chains are usually the biggest establishments in Frederiksberg, having many seating spaces for consumption on-site (OFC- 4.1; OCC- 4.1; OCC- 4.3). Still, they rank highly in terms of SUP items per consumer because these businesses do not distinguish between the tableware offered for takeaway or on-site. Paper cups lined with plastic, plastic lids, plastic wraps for food, plastic cutlery and other SUPs are served on-site as well as for takeaway. In one of the fast-food restaurants (OFC- 4.1), takeaway orders are served in a paper bag so that the food can be transported elsewhere while the only difference with on-site orders was that they were served on a reusable plastic tray to be returned on a specific

shelf. As a result, the number of SUPs distributed to consumers remains unchanged even though the order is consumed on-site. This explains for a large part why chains are one of the biggest contributors to the consumption of SUPs in Frederiksberg.

From bad to positive influence

Distinguishing between the tableware offered for on-site consumption and takeaway can have a big impact on the number of on-site SUP items per consumer. In the previous paragraph, it has become clear that fast-food chains and café chains in Frederiksberg are big contributors to the on-site usage of SUPs. However, a closer look at the café chains reveals an interesting distinction: café chain 3 presents roughly half the amount of SUP items as café chain 1 and 2. Figure 1.2 gives an overview of the on-site SUP consumption per consumer for café chains and café non-chains in Frederiksberg.

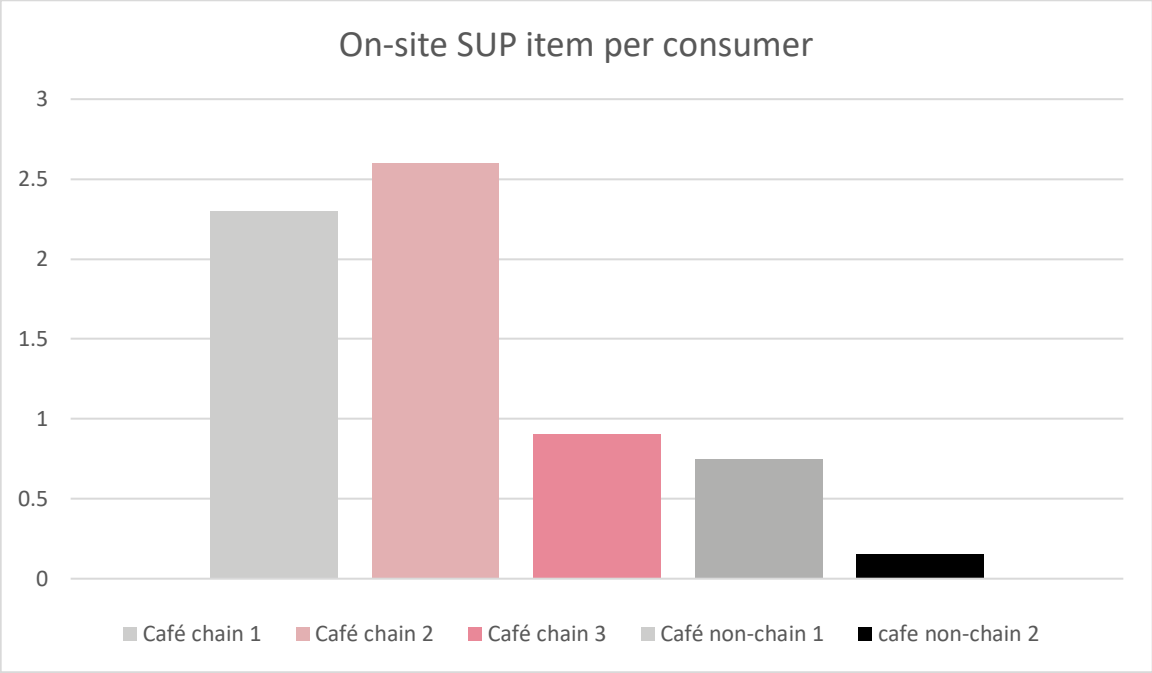

Figure 1.2 Average number of SUPs per consumer per specific café chain in Frederiksberg, Copenhagen.

Café chains 1 and 2 have a takeaway as their main service and they do not distinguish between the tableware used for on-site consumption and for takeaway (OCC- 4.2; OCC- 4.3). However, café chain 3 does make this distinction. This business asks its consumers if their order is for on-site or takeaway and based on the consumer's choice, different tableware is offered. Takeaway consumers receive the traditional paper-lined-with-plastic cups but the consumers that stay on-site receive their beverages in ceramic mugs. This shows that making a distinction between the tableware offered, and therefore using reusable alternatives for on-site consumption, can have a big impact on the amount of on-site SUP that chains contribute to.

Another notable factor that might explain why some takeaway establishments use fewer on-site SUPs per consumer can be seen in non-chain café 1. Even though non-chain café 1 is located in Frederiksberg Shopping Centre and has a larger number of consumers, and its business model relies on takeaway, it still scored relatively low on SUP items per consumer. This establishment follows a similar differentiation to café chain 3. It is divided into two floors where the ground floor provided a system primarily meant for takeaway, and the first floor was meant for on-site consumption. Observations showed that on the ground floor almost all items provided to

customers were SUPs even though they were consumed on-site. Whereas upstairs on-site SUPs were little to not observed (OC-4.1). These findings further support the argument that on-site SUPs increase when the main model is takeaway.

Let the customers choose the tableware

Another issue related to the takeaway business model of cafés and fast-food chains is the lack of choice given to the consumer over the tableware served. Chains that have the takeaway service model appear to have rigid rules over the service and how it can be influenced by the consumers. Often using your own reusable cup or tableware is not possible. In certain fast-food establishments, the process of ordering occurs at electric displays replacing the staff (OFC- 4.1). In these cases, intervening in the process of asking for reusable tableware or any other request becomes almost impossible. As a result, SUPs are served to everyone regardless of personal preferences and consumption of plastic cannot be avoided.

An opposite practice implemented by most the non-chain cafés and fast-food restaurants is displaying the available tableware at the counter, visible to the consumer during the ordering process (OFF- 4.1; OFF- 4.2). This gives the freedom of choice of consuming plastic directly to the client, with the purpose of letting the consumer choose the preferred tableware. Interestingly, in a small fast-food restaurant, which gave consumers the possibility to choose between plastic (SUP) and metal (reusable) tableware, none were even used (OFF- 4.1). Therefore, the choice of plastic consumption to the consumer itself can lead to a reduction of SUPs and can also show the businesses that some disposable tableware is not needed at all.

In a nutshell

It is not because the business model of the chains prioritizes takeaway consumption that a bigger number of on-site SUPs are seen. Instead, it is the lack of differentiation between the on-site or takeaway consumption that can be pinpointed as the main reason for the bad influence of takeaway. If consumers are given a choice of tableware for their on-site experience, it is likely that this will have a positive influence on the amount of SUP used.

CHAPTER 2 | Single-used Perspectives

One relevant topic can enlighten the reason for the prevalence of single-use plastic products in Frederiksberg: convenience. Plastics have the place they have in our lives because of their unique capacity of being malleable, impermeable, and light. Simply put, they are easy to use. As we identified in Chapter 1 when businesses were not able to differentiate the tableware used from takeaway and on-site, the SUP consumption on-site increased. In fact, easy-to-use containers, such as paper-lined-with-plastic cups and traditional plastic cups, are widespread within the café and restaurant industry in Frederiksberg because of their convenience. But convenience means different things to businesses and consumers. For the small businesses in Frederiksberg that still used SUPs, convenience related to the easiness of the purchase and its use. On the other hand, Frederiksberg consumers' convenience related to the overall service in the establishment they chose to dine in, giving little importance to the type of tableware they were provided with. As a result, we noted that businesses and consumer's thoughts on convenience were not aligned, whereby the latter represents the main barriers to reducing SUPs consumption and the latter can act as a facilitator.

Not enough space, money, and personnel

Concerning the convenience of SUPs for businesses, two main findings stood out. The first one relates to the physical space and human resource boundaries, and the second one to the knowledge level that businesses have of reusable alternatives. The convenience of SUPs increases in small cafés and fast-food establishments, where

there is no physical space for washing stations or available personnel to wash the tableware (FF- 4.1). Using SUPs gives the possibility to businesses to operate in a very small space or with limited personnel. Food trucks, for example, most often do not have access to running water, so using SUPs seems to be the only possible solution for them (FF- 4.1). In an interview with a sustainably minded food truck owner with on-site dining, when asked why they chose to maintain their use of plastics even for the customers that chose to dine in, they explained (FF- 4.1):

"We don't have a facility to wash, no access to water. This is the first thing. We don't think about price, we think about space. You don't have that much space here. This is not a restaurant; we don't have the storage room here"

Consequently, for some businesses, there is no available space to store, wash and dry tableware. This issue applied also to kebabs and fast-food sandwich places in Frederiksberg which generally have a very small kitchen area. Such establishments often base their business model on the quickness of food preparation and service to the consumer and the convenience of SUP allows them to serve meals as quickly as possible (FFC- 4.1). Moreover, as already mentioned in the Chapter 1, convenience also means the possibility of not distinguishing between takeaway and on-site consumption. The same tableware is offered by default to all consumers, making the serving process more streamlined for the employees. One fast-food business (FFC- 4.1) that used SUPs and carboard for his business mentioned that having to wash plates would not be convenient for him. In addition, he was worried about the cost of using more water in his business: "Water also costs a lot. It's more expensive".

Two sides of the same story

While many businesses agreed on and were aware of SUPs not being the best option for the environment, we found that making the change towards a reusable alternative was not an easy task. In this regard, two lines of thought emerged from our research. First, businesses that still used SUPs mentioned that they chose to use them mainly because they could not find alternatives (CC- 4.1) and because the costs involved in making the change were considered too high (CC- 4.2). Indeed, we can consider that using SUPs is the norm in the industry. Businesses can order them with ease, and they were also perceived to be a cheap investment. The business owner survey revealed the common perception of alternatives to SUPs as being not suitable or easily accessible; as one business stated: "I would rather skip plastic if there was an alternative." (BS). In fact, compared to reusable alternatives, the supply chain for SUPs is well established in Copenhagen and even for smaller businesses, a trip to a big supermarket will be enough to find those supplies (FF- 4.1). Second, businesses that have switched or that mostly use reusable tableware are unanimous in saying that using SUPs was more expensive than the alternatives they currently use (C- 4.1). The reason for this is that businesses considered the purchase of reusable tableware as a long-term investment, whereas SUPs had the constant cost of restocking and a shorter product lifecycle.

As explained by an employee of a small café chain (CC- 4.2): "I don't know why the boss chooses to use these plastics. But I think maybe because it is cheaper". We believe this discrepancy comes from a lack of awareness of the actual costs of shifting to a reusable alternative, combined with a lack of knowledge of possible tableware alternatives for their business. Both small- and large-scale businesses that still use SUPs for their takeout and dine-in expressed the lack of time and the difficulty of finding a suitable replacement (CC- 4.1). Although small establishments lack the resources to either explore alternatives or purchase them, bigger chains, cafés, and fast-food restaurants are better placed to research the alternatives needed. In particular, one café chain has been taking important steps to replace its SUPs with ceramic mugs, plates, and cutlery for dine-in (CC- 4.1). They still used SUPs for cold drinks but were looking for alternatives to change (CC- 4.1):

"We haven't found a better alternative yet, they [corporate office] are looking to find some, and we are going to start having to-stay glass cups to minimize the use of plastics even more. We can do better. So right now, we are using plastic, but there are products out there that can be used. We just need to find them."

From this interview, it is possible to notice that there is an intersection between the convenience for businesses and the convenience for consumers. Accordingly, most businesses are willing and interested in switching to a reusable system, not only to solve environmental problems but also to attract more customers by having a "green" image (CC- 4.1).

A positive note: consumers are not a barrier

Convenience for consumers means not having to choose between dining in or taking away, it does not involve thoughts of costs. Data from observations and the consumer survey showed a clear distinction in the service that customers expect to receive from the different types of establishments. Based on consumers' preferences, figure 2.1 and 2.2 indicates that the consumption of a meal was not the main reason for visiting a café or a bar. On the contrary, most of the respondents stated that the main reasons for visiting a café or bar were socializing, spending their free time, studying, or working. In fast-food restaurants, however, this trend was not seen. The most popular reason that Frederiksberg consumers stated for going to a fast-food restaurant was to eat or drink something (73%), whereas socializing appears only in 17% of the choices. We also noticed this difference in some establishments where consumers were likely to leave immediately after consuming their meal in fast-food restaurants, whereas in cafés and bars consumers were mainly in groups and stayed for longer (OC-4.1; OFF-4.1; OBAR-4.1).

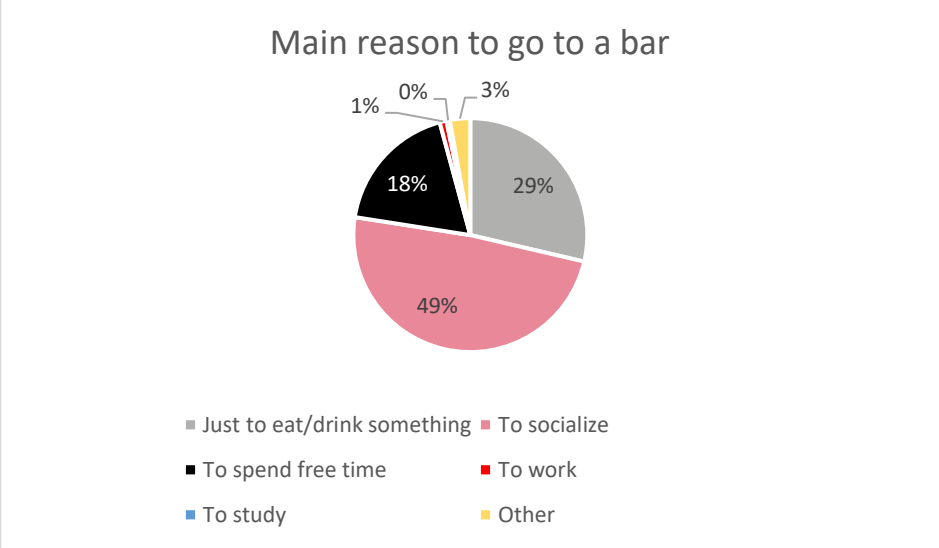

Figure 2.1 Main reasons for consumers to go to a Bar in Frederiksberg

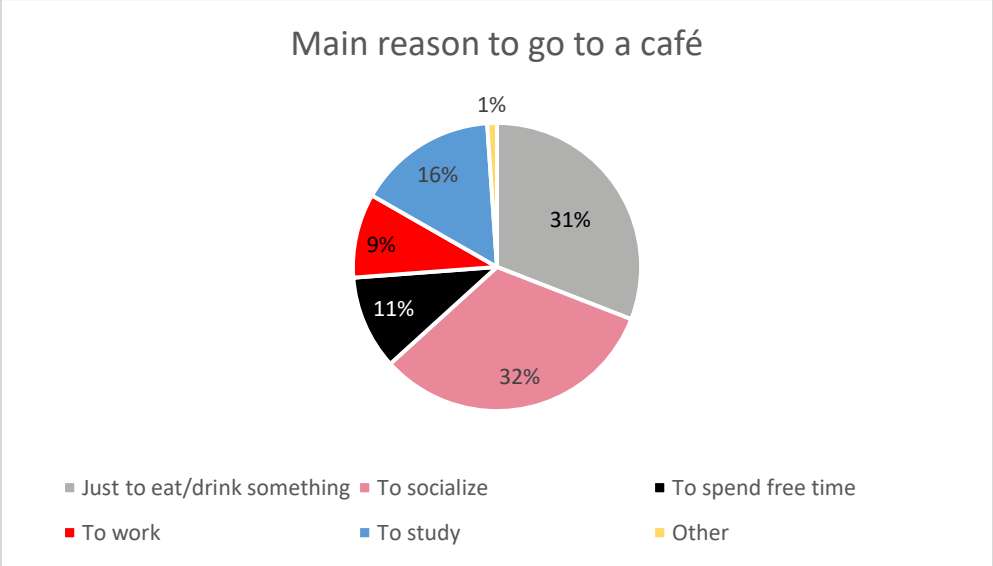

Figure 2.2 Main reasons for consumers to go to a café in Frederiksberg

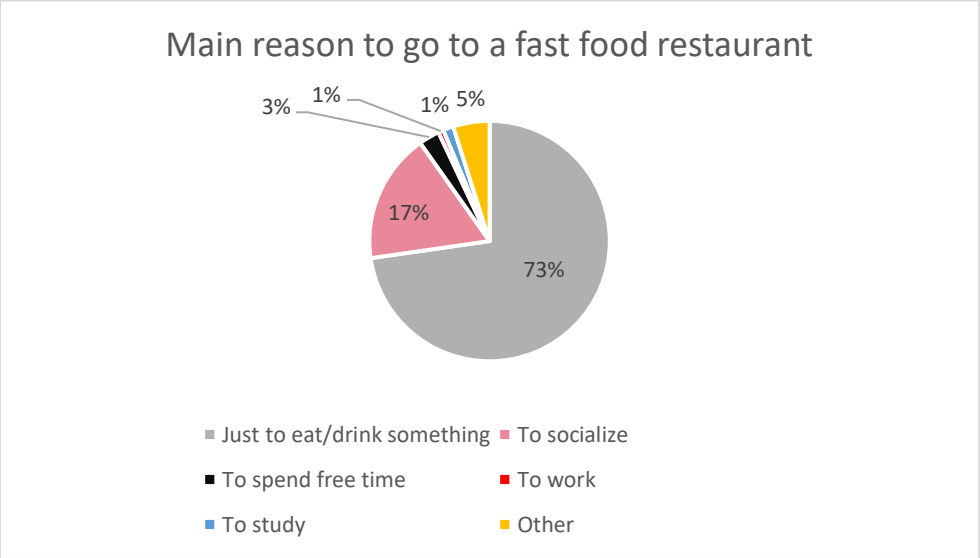

Figure 2.3 Main reasons for consumers to go to a fast-food restaurant in Frederiksberg

Therefore, convenience plays a more significant role in fast-food restaurants since the nature of customers' visits is mainly transactional. The convenience that consumers search for can explain why SUP tableware is slightly more preferred in fast-food restaurants than in other establishments (see figure 2.4, below). Nevertheless, the majority of fast-food consumers either prefer to eat with reusable tableware (57%) or do not have a specific preference (21%). As just seen, the tableware offered is not an important factor when consumers are choosing where to eat, but rather prefer where to go based on the full range of the dining experience offered. Hence, since the customers' dining experience and expectations are paramount for businesses in their decision-making, consumer's shifting to reusable alternatives do not represent a problem for consumers.

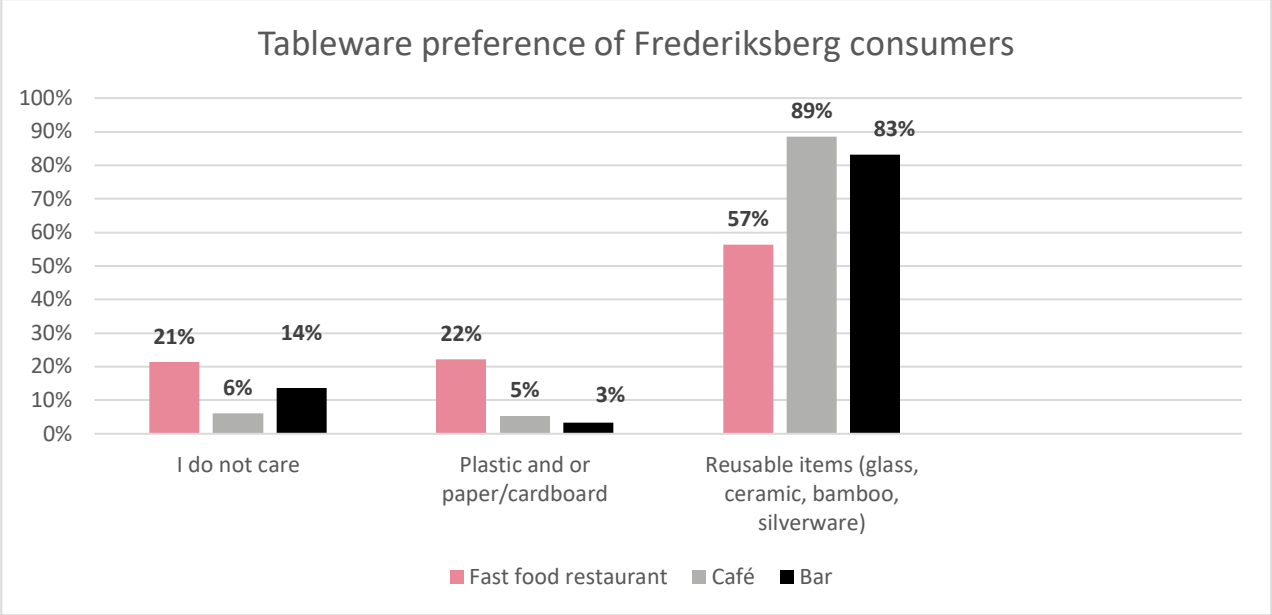

Figure 2.4 The percentage of preference for different tableware in different types of establishments

In a nutshell

Convenience does play a crucial role in SUP consumption and is currently one of the main reasons for an establishment to choose SUPs over reusable tableware. However, we have seen that the main barriers contributing to the difficulty of shifting to reusable alternatives mainly concern businesses rather than consumers. In fact, this case demonstrates that consumers' preferences and lack of interest in the matter might function as a facilitator for the transition in Frederiksberg. More specifically, the fact that SUPs are not preferred in dining places where convenience is key can be considered as a catalyst for change, showing that the consumers are ready to be offered a different alternative. Based on this finding, we can conclude that for Frederiksberg, a plan to phase-out of SUPs in the café, fast-food and bar sectors need to focus on the physical and economical constraints of the businesses rather than creating awareness or convincing the consumer. Businesses will still want to offer the best service for the customer, but when a suitable alternative is in place, consumers will most likely accept the reusable alternative.

Figure 3.1 The view of the Frederiksberg neighborhood

A lack of interest by consumers did not mean a lack of awareness about the SUP problem. We found there was a general understanding that the SUPs presented a problem to the environment, and both consumers and businesses seemed to support alternatives to SUPs. But while Frederiksberg calls itself "the green heart of Copenhagen" the neighborhood does not stand out for its environmental image. There was little visible environmental communication and visible effort from the cafés, fast food and bar sectors to promote a shift towards reusables. Awareness of the problem did exist, though the little initiatives that were present were not well communicated. Moreover, there were little to no businesses that pride themselves on being environmentally friendly. The problem of single-use plastics did not seem to be in the forefront of people's minds. There was no presence of a highly polarized debate, nor was it an issue that provoked strong emotions, the general agreement around the topic may be what caused it not to be addressed more outspokenly.

An underlying environmental consciousness exists...

A lack of consumer awareness regarding the problems that SUPs present for the environment did not seem to be an issue in Frederiksberg. Most Frederiksberg consumers (67%) have concerns about single-use plastics and identified their environmental impact as one of the major issues. Environmental consciousness is also represented on the graph below (Figure 3.2), where consumers ranked environmental benefits as the first criteria to consider when switching from SUPs to reusable tableware. From this, we noted that the majority of consumers in Frederiksberg were aware of the environmental impacts that continued use of SUP brought and that its phase-out would bring benefits to the environment.

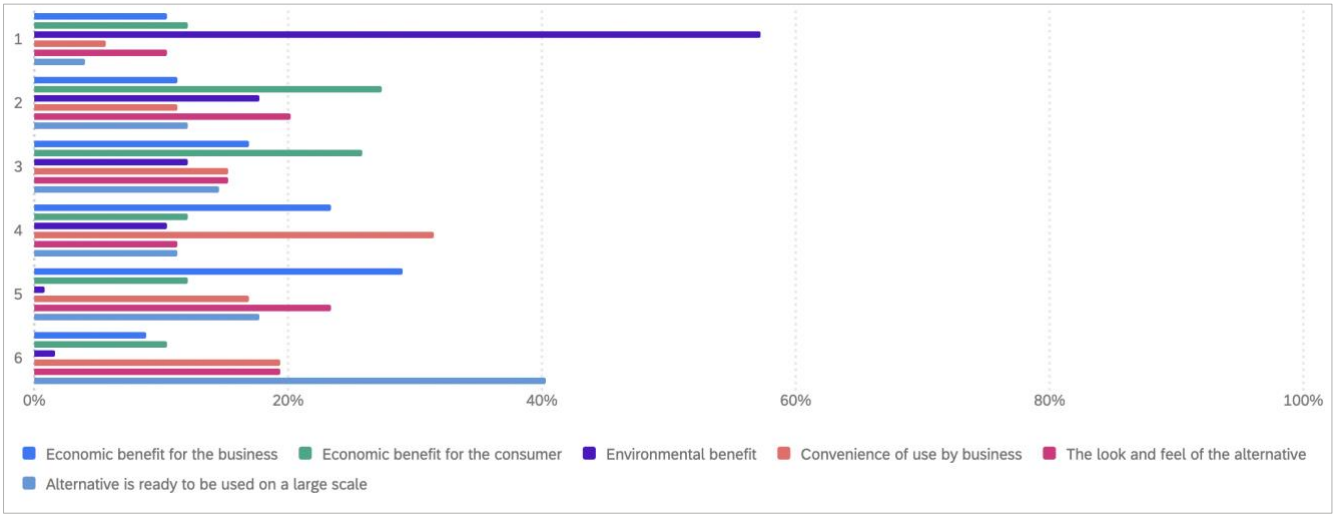

Figure 3.2 Results of consumer survey question: If all cafés and restaurants in Copenhagen would replace single-use-plastics with reusable tableware (e.g., bamboo, ceramic, reusable plastic), which of the following criteria would be most important to consider when choosing the reusable alternative? Please rate them from 1 to 6, where 1 is the most important and 6 is the least important.

During the interviews with businesses in Frederiksberg, it became apparent that most of them were willing to become more environmentally friendly by looking for alternatives to SUPs or already choosing single-use tableware with less plastic on them. Businesses were aware that the SUPs presented an issue, there was no instance where this was denied or minimized, only during one interview an employee claimed to prefer plastic cutlery over wooden cutlery because of the poor usability of the latter (FFC- 4.1). What stands out are some actions that the businesses took to change their plastic usage:

"We are using a lot of to go coffees in single-used cups. And lids, but we changed to compostable versions." — Café chain owner (C- 4.1)

In the area we identified that the cafés and non-chain fast-food restaurants we talked to were aware of what disposable plastic tableware they used, and some had already planned how to offer a more sustainable tableware to their clients.

"We've never used plastic in store, besides the small sauce containers. We didn't see any problems when doing that. We are also in the middle of redesigning our whole packaging. And that was a natural way to go to remove whatever plastic things we could." — Fast-food restaurant manager (FF- 4.2)

This type of conscious mindset exemplifies the common understanding that exists in the district between businesses and consumers regarding the harmful consequences that plastics present to the environment. This is a baseline perception for the neighborhood, but perhaps because it is common knowledge, it is not at the forefront of people's minds. As a commonly accepted problem, it seems to fall back on the list of environmental priorities since we noticed that there are little to no solutions proposed in the neighborhood or actions are taken to position themselves against plastic use.

…which does not translate to businesses environmental communication

Given the existing awareness of SUPs, it is interesting to note that businesses in Frederiksberg had very few signs, posters, communication or clear branding focusing on environmental communication. By environmental communication, we mean campaigning for environmentally friendly behavior or using it as a unique selling point for the business. The businesses that still use SUPs did not have any special communication that motivates or promotes pro-environmental behavior for on-site consumption. As aforementioned in chapter 1, in two cafés (OCC-4.1; OC-4.1) employees would ask if the consumption was on place or to-go and then adapt the tableware given accordingly, thus replacing the need for on-site advertising. However, other establishments did not advertise in any way the possibility of asking for reusable tableware or using personal reusable tableware. As a result, customers may not be aware of the possibilities available to them in order to avoid SUP consumption. A good example to show the lack of communication between the establishments and the customers is provided by one café that offered a discount scheme for the customers that brought their own coffee cups from home:

"If you bring your own cup, you get stamps and when you have 10 you get a free drink. If you bring your own cup, you get an extra stamp. So, we're trying to encourage you to bring your own cup." (CC- 4.1)

This great initiative was not communicated on the premises of the café, making it impossible for new customers to find out about this incentive. According to the survey, 78% of consumers possess their own reusable alternatives, such as water bottles, straws, cups, etc. And the data shows that 66.92% of consumers said they would be motivated to bring their own tableware to restaurants if they could get a discount for bringing their own reusable tableware. But as in the neighborhood there is no communication about it, we have observed that there are virtually no customers who use their own tableware when they go to a café (OC- 4.1; OC- 4.2; OCC- 4.1; OCC-

4.2; OCC- 4.3; OFC- 4.1; OFC- 4.2; OFF- 4.1; OFF- 4.2). As a result, the lack of communication on environmental activism contributes to the consumption of SUP.

Overall, it is possible to state that communicating or labelling sustainability was not a priority that characterizes the district of Frederiksberg for both businesses and consumers. When facing the decision to select their preferred tableware during the consumer material test, environmental impact turned out to not be the main reason influencing the decision. Even though most of the participants chose ceramic tableware as the most preferred option, the main reason for this choice was the look and design of the tableware and the feel of it while eating. Interestingly, participants ranked the least preferred choice disposable tableware for the same reasons as the ceramic tableware. Therefore, consumers generally tend to value the design and the dining experience of the tableware over the environmental impact. In fact, this aspect of Frederiksberg's consumers is confirmed by their preference for plastic cutlery over wooden ones (MUT-4). The most unsustainable option is selected because the taste of the food would be affected by the type of material, consequently being considered unpleasant (MUT-4). When asking fast-food customers what their reasons were for preferring a specific type of tableware, environmental concerns are still the biggest driver (38%) for preferring reusable or bamboo tableware, even though convenience ranks closely (23%) for plastic options and concerns about the taste and design are still present in 10% of the cases.

Similarly, businesses in Frederiksberg also indicated other factors more relevant than environmental impact when considering a shift from SUP tableware to a reusable option. Low investment costs for businesses were seen as the most important criteria. The ranking demonstrated that environmental impacts (e.g., carbon impact, water consumption, durability) were on average ranked in the middle, showing that while sustainability is an important concern, economic factors may be more important.

In a nutshell

From this data, we can conclude that while Frederiksberg is conscious of the relation between the use of SUPs and environmental problems, this is not a debate that stays at the forefront of the community. While some cafés and fast-food restaurants do take steps to become more sustainable, there is a lack of communication on the solutions that can curb this problem. Lack of interest in this topic can be seen from the consumer's and business side which can be a problem when trying to engage the neighborhood in a change of habits. One first step to bring the existing awareness into action could be to transform the SUP issue into a more present topic when visiting cafés, and restaurants.

CHAPTER 4 | Ready, Set, Inaction!

As we have seen in the previous chapters, the issue of on-site single-used plastic in food and beverage establishments in Frederiksberg is mainly associated with business models that focus on take-away, the convenience for businesses and a lack of environmental communication. Though, what remains controversial is who should take the lead in bringing forward adequate solutions to minimize the issues related to SUP consumption. In other words, who is perceived as being responsible for (in)action? There is no straightforward answer to this question. Whilst there are some commonalities between the perspectives of different actors, they tend to point fingers at one another. In this final chapter, we attempt to provide an overview of the actors that are seen as being responsible for action in Frederiksberg, whether these actors perceive themselves as being responsible, and in turn whom they see as responsible for taking action. Most businesses in Frederiksberg acknowledged that how they run their business has an impact on their use of SUPs. However, they pointed to other actors when indicating barriers to shifting to reusable alternatives. In turn, Frederiksberg Municipality has taken responsibility within their municipal boundaries, though pointed to businesses for being responsible for

their business model. They perceived their role as being a facilitator and therefore do not see themselves as being in the right position to push forward solutions. Change and action, in their view, should come from an external actor that is willing to take the risk and bring about change.

An overview of how the responsibilities for action regarding a change in SUP consumption are perceived by the mentioned stakeholders can be seen on Figure 4.1. The direction of the arrow refers to who that stakeholder believes should be responsible for taking action.

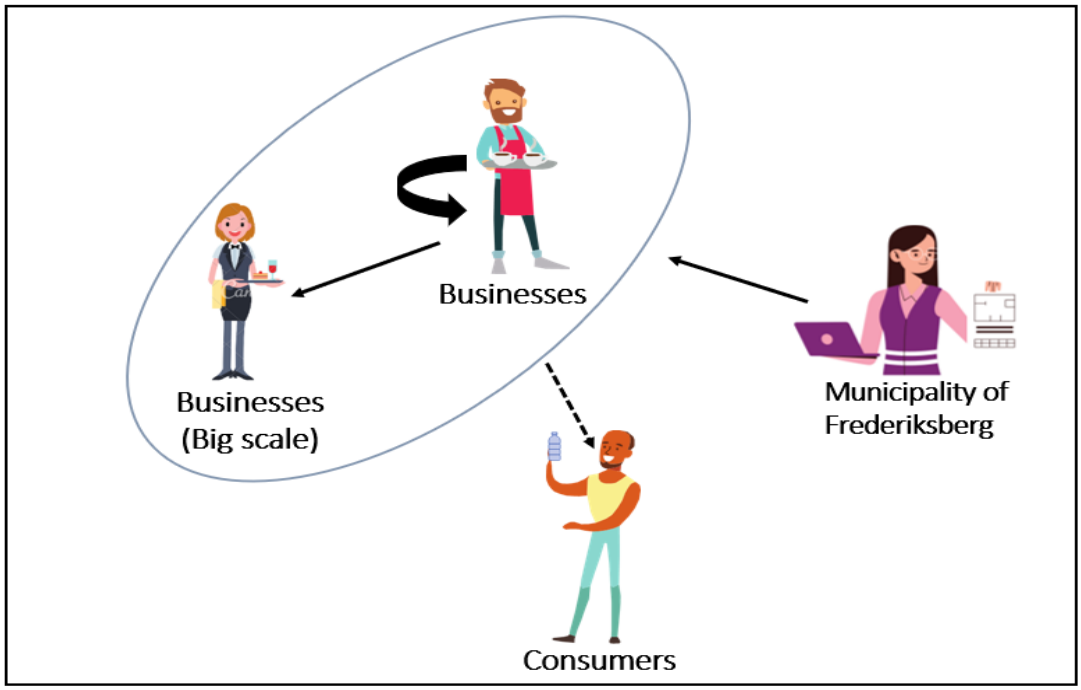

Figure 4.1 Responsibility perceptions about on-site SUPs consumption in Frederiksberg

Businesses as Villains or Victims

"I think the responsibility is for the owner of the place, they can change and try to find another solution and the people will get used to that system" – (C-4.2)

Businesses: Ready, set

The large majority of the interviewed businesses acknowledged their influence on the number of single-use plastics used in their establishment (C- 4.1, C- 4.2, CC- 4.1, CC- 4.2, FF- 4.1). In detail, most non-chain businesses referred to themselves as the ones who have the authority to make decisions when considering their choice of tableware. They identified themselves as being able to change the materials they use, as facilitators for offering and actively advertising reusable alternatives, and as the decision-maker(s) for making investments. Despite acknowledging their share of the problem, and their ability to change to reusable alternatives, most businesses identified barriers related to their competencies in taking responsibility. This included a lack of knowledge of alternatives, where a business stated: "I don't know what you can change instead of this one [referring to SUP item]. I have never seen it here in Denmark" (FFC- 4.1). Even the businesses that were aware of possible alternatives identified finding the right ones that fit their business model as an obstacle for taking responsibility. A manager from a café chain, when explaining the choice for still using single-use plastics for cold beverages, expressed: "It is a long way. […] and finding alternatives is hard" (CC- 4.1).

Businesses: (In)action

Besides the barriers that businesses in Frederiksberg identified in relation to themselves, they also saw other actors as bearing responsibility for the SUP issue—or preventing businesses from taking responsibility. One barrier is a lack of consumer willingness, which, as they argued, prevented them from shifting to a reusable system (C- 4.1, CC- 4.1). They referred to the normalization of using reusable alternatives and environmental awareness as a consumer responsibility. Some businesses were specifically critical of the willingness of youngsters/youth, referring to them as uneducated or just following trends and advertisements, and they highlighted the power of (social media) influencers (CC- 4.1, FF- 4.1).

"They want ours, especially like a lot of influencers and stuff, to take pictures with the disposable ones transmit that" – Manager café chain (CC- 4.1)

Moreover, some smaller businesses viewed the big chains as having a greater responsibility to act. It was argued that these big chains have a bigger share in the SUP issue and more financial resources. The owner of a small fast-food establishment argued: "If we can afford that [referring to alternatives to SUPs] the big corporations like McDonald's which have chains in the whole world can definitely do it. They don't want it, and that is the problem" (FF- 4.1). Lastly, when businesses were prompted with a list of responsible parties for shifting from SUPs towards reusable alternatives all chose, among others, governmental bodies (BOI). Though, some voiced concerns about the actions of governments: "For me it's just supposed to be a switch who's in charge and who leads. Because they [governmental bodies] are thinking mostly about money, and they're thinking in short term" (FF- 4.1).

Frederiksberg Municipality as Villain or Victim

"We have this huge task to do. But of course, somebody must go in front and show it can actually work." – Employee Frederiksberg Municipality (GOV-2)

Frederiksberg Municipality: Ready, set

As we have highlighted above, businesses in Frederiksberg saw governmental bodies as a responsible party for shifting from SUPs towards reusable alternatives. However, do the governmental bodies see themselves as part of the problem and, perhaps, responsible for taking action? An interview with an employee of the Department of Waste and Recycling in Frederiksberg provided insights into these matters. Frederiksberg Municipality is responsible for providing services for waste collection and management. They are fully responsible for collecting and processing household waste. While for businesses in Frederiksberg waste collection is mostly privately organized. The focus of Frederiksberg's waste management strategy is on effective recycling. The problem, as argued by the interviewee, is the quality of the plastics currently used in food and beverage establishments in Frederiksberg, which are often not well suited for recycling. Despite the municipality not being responsible for the waste collection of businesses, the interviewee highlighted that SUPs that are used by businesses often end up in the household waste collected by the municipality and therefore become their responsibility. Since these types of plastics are often not well suited for recycling they eventually end up in the waste incinerator.

"Some plastics are said to be very bad. But there are situations where they are good quality plastic, we know what kind of plastic that is, we can easily recycle it. For example, PET plastic is extremely easy to recycle. So, if we have that kind of plastic, it is better than using bamboo, because we cannot recycle bamboo. So, we must be careful about what we are banning." – Employee Frederiksberg Municipality (GOV-2)

The Municipality of Frederiksberg saw itself as having only a facilitating role regarding the transition to reusable alternatives since from a legal point of view such legislation belongs to national law. However, they do educational work regarding waste separation and prevention for businesses in Frederiksberg (GOV-2). Moreover, they voiced their concerns regarding the current degree of uncertainty in implementing solutions for the SUP issue. A main

barrier for the municipality is a lack of knowledge concerning the effectiveness of the sustainability impact of business models that are already using reusable solutions. Therefore, it is not yet known how successful these solutions are, from an environmental perspective. The environmental impact caused by reusable tableware if trashed and not reused remains unknown: "If you have a reusable cup and throw it out in residual waste, it's way worse than just getting a single-use cup" (GOV-2).

Frederiksberg Municipality: (in)Action

Besides their authoritative responsibilities within their legal boundaries, Frederiksberg Municipality clearly stated that they are not responsible for how businesses are run and that there are limits to what the municipality can do. They viewed businesses as the main responsible for their use of SUPs (GOV- 2). As pointed out by the interviewee: "The responsibility lies with the business owner who provides a service" (GOV- 2). Furthermore, the municipality does not influence how businesses run their operations, because that belongs to the private sphere. Despite this, the interviewee highlighted that the municipality could inform them about how to take care of their waste or how to minimize it. Viewed in this way, the consumer also gets a free pass in their responsibility: "It is not the responsibility of the consumer how other people are running their business" (GOV-2).

Aside from pointing to businesses as being responsible for their business model, the interviewee highlighted that the Frederiksberg Municipality would like to have a good connection with the local business (GOV-2). If the businesses in the municipality area are doing well, this is also a good thing for the citizens of Frederiksberg, a good infrastructure benefits both parties. To summarize the perspective of the Municipality, in their limits and possibilities for action:

"We have this huge task to do. But of course, somebody must go in in front and show it can actually work […] and somebody has to be the first somebody has to say it's a good idea. And I will help to show it is a good idea" – (GOV- 2)

In a nutshell

Overall, in Frederiksberg, businesses accept that they are part of the issue, and bear responsibility, though they argue that they are reliant on other actors for taking responsibility. Additionally, Frederiksberg Municipality does not perceive itself as being in the right position to push for specific solutions but shows a willingness to take responsibility in terms of facilitating these. This results in an impasse: where action is required to create solutions for the SUP issue, no one has, yet, taken on this responsibility, leading to overall inaction.

Conclusion

This report researched Frederiksberg's cafés, bars and fast-food restaurants, its business representatives, its consumers and its municipality to understand consumption patterns, different perspectives, opinions and ideas regarding single use plastics and reusable alternatives. In this concluding section, we will condense all the findings presented in Chapters 1 to 4 and provide an overview of the main obstacles and catalysts for phasing out SUPs in Frederiksberg.

While not noticeable at first sight, our analysis showed that Frederiksberg is a big contributor to SUPs in Copenhagen. In detail, fast-food and café chains had played a big part in contributing to SUP consumption when their business model did not distinguish between the tableware used for takeaway and on-site consumption, thus unnecessarily using the same SUP tableware for both services. On the contrary, we observed that when the

differentiation between the types of tableware is made, the number of SUP per customer diminished greatly. Most of the local establishments in the district already employ this internal policy, while larger chains still stick to one type of SUP tableware.

Interestingly, chains have the resources, space and personnel to easily sustain a change from only SUPs to a reusable system. In contrast, smaller places that still rely on SUPs for convenience, usually non-chain fast-food restaurants, may not have those resources at their disposal, making the switch to reusable alternatives a more challenging task. Luckily, consumers would not pose a problem for businesses if a potential switch occurred. While the convenience of SUPs is a strong reason for businesses in Frederiksberg to continue using them for on-site consumption as well, the consumers in the district do not have a specific preference for this, indicating that consumers are ready to accept whatever the available choice is. This finding highlighted the environmental consciousness of both businesses and consumers of Frederiksberg. Albeit awareness of the SUP issue exists, this is not a debate that stays at the forefront of people's minds. Businesses do not present any environmental communication encouraging a more sustainable behavior, nor advertise sustainable initiatives already in place, causing little to no engagement with consumers.

Lack of cooperation is indeed an additional problem that emerged for the analysis of responsibility for leading the shift to a reusable system in the district. Specifically, businesses are the ones better placed to perform and drive a phase-out of SUPs forward. Even though the local municipality is looked upon by businesses for this endeavor, the municipality's range of action is restrained by national laws. Therefore, acting as a facilitator focusing on educational activities, waste management, and preparing a legal framework to guide establishments that are intentioned to shift to a reusable system is a more fitting role for the municipality. On the contrary, we conclude that businesses in Frederiksberg are the most important actors that can change the current situation of inaction. Nevertheless, cooperation among all stakeholders is needed to overcome the barriers limiting businesses from taking the initiative.

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Annex 1.1 List of SUP's items

Plastic wrap
Plastic utensils (fork and knives)
Plastic straws
Plastic storage (sauces or jam containers)
Plastic cups
Plastic bottles
Coffee cup lids
Drink stirrers
Plastic plates

Annex 1.2 List of restaurants and cafés categories

Category	Definition
Restaurant – Fast food (non-chain e.g., kebab)	A fast-food restaurant serves fast food and has minimal table service (often smaller) establishment. This includes shawarma/kebab places, fish & chip places, snackbar etc.
Restaurant – fast food chain	A fast-food restaurant serves fast food and has minimal table service. To be considered a chain you have a minimum of 4 locations. They are either under shared corporate, private ownership or franchising agreements. Typically, the fast-food restaurants within a chain have a similar architecture, standard menu, and other services.
Cafés – Normal	Primarily serves coffee of various types, sometimes also cold drinks, including iced coffee or tea. A café may also serve food, snacks, sandwiches, pastries, fruit, or muffins.
Cafés – Chain	Chain of cafés with a similar menu at all locations. Primarily serving coffee of various types, sometimes also cold drinks, including iced coffee or tea. A café chain may also serve food like snacks, sandwiches, pastries, fruit, or

	muffins. For instance, Starbucks.
Bars/pubs	An establishment that serves alcohol without the requirement of ordering food.

Annex 2. Codebook Data Collection Methods

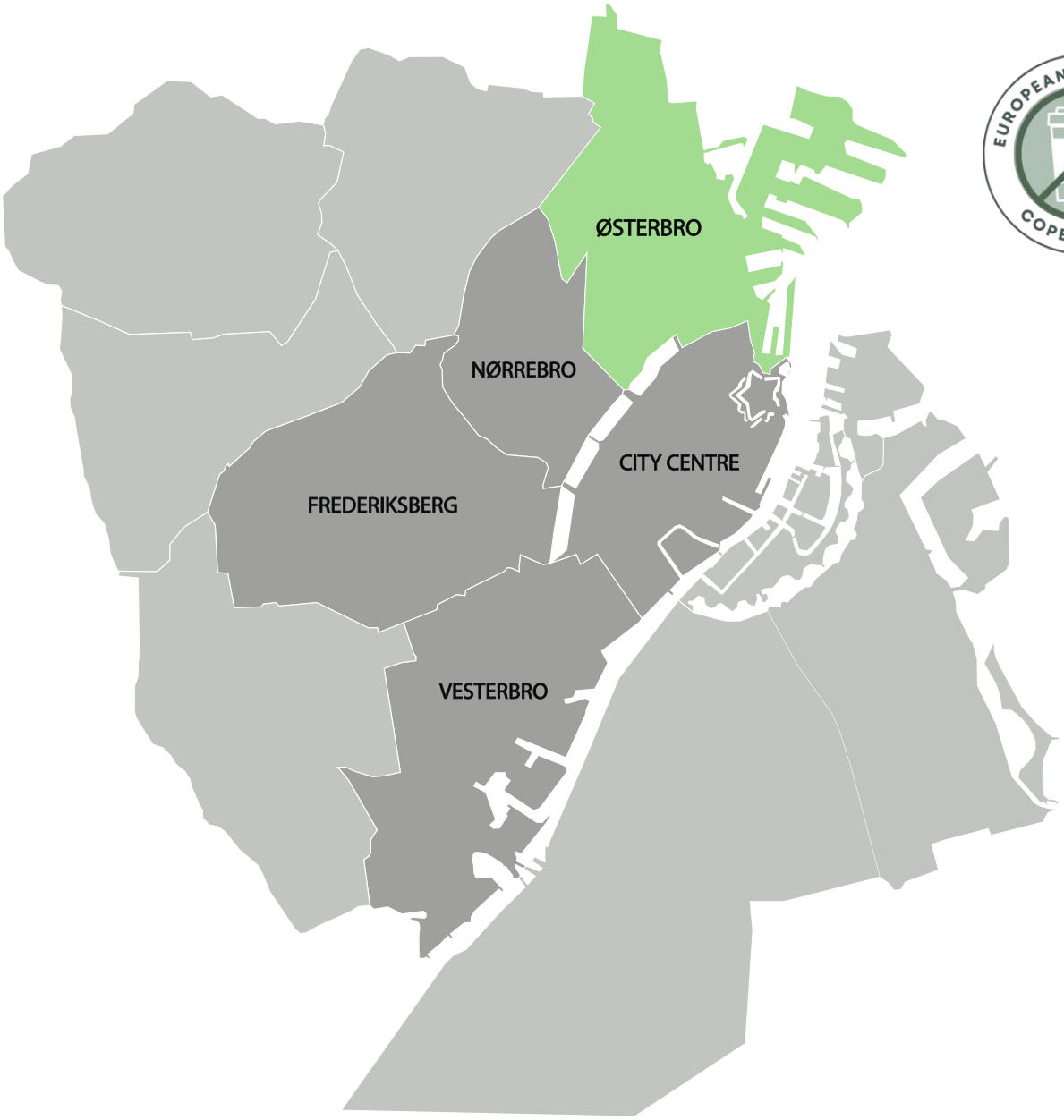
Code	Description	Date	Area
C- 4.1	Owner Café non chain	01-06-22	Frederiksberg (GEO 4)
C- 4.2	Worker Café non chain	03-06-22	Frederiksberg (GEO 4)
CC- 4.1	Manager Café chain	06-06-22	Frederiksberg (GEO 4)
CC- 4.2	Manager Café chain	06-06-22	Frederiksberg (GEO 4)
FF- 4.1	Manager Fast food non chain	02-06-22	Frederiksberg (GEO 4)
FF- 4.2	Manager Fast food non chain	02-06-22	Frederiksberg (GEO 4)
FFC- 4.1	Manager Fast food chain	03-06-22	Frederiksberg (GEO 4)
BAR- 4.1	Manager Bar	01-06-22	Frederiksberg (GEO 4)
BAR- 4.2	Worker Bar	02-06-22	Frederiksberg (GEO 4)
GOV-2	Employee Municipality of Frederiksberg	09-06-22	Frederiksberg (GEO 4)
BOI	Business owner interview (overall)	-	Copenhagen (General)
BS	Business owner survey	-	Copenhagen (General)
OBAR-4.1	Consumer observation Bar	03/06/22	Frederiksberg (GEO 4)
OC-4.1	Consumer observation Café non-chain	02/06/22	Frederiksberg (GEO 4)
OC-4.2	Consumer observation Café non-chain	03/06/22	Frederiksberg (GEO 4)
OCC-4.1	Consumer observation Café chain	03/06/22	Frederiksberg (GEO 4)
OCC-4.2	Consumer observation Café chain	01/06/22	Frederiksberg (GEO 4)
OCC-4.3	Consumer observation Café chain	04/06/22	Frederiksberg (GEO 4)
OFC-4.1	Consumer observation Fast-food chain	01/06/22	Frederiksberg (GEO 4)
OFC-4.2	Consumer observation Fast-food chain	04/06/22	Frederiksberg (GEO 4)
OFF-4.1	Consumer observation Fast-food non-chain	02/06/22	Frederiksberg (GEO 4)

OFF-4.2	Consumer observation Fast-food non-chain	06/06/22	Frederiksberg (GEO 4)
OBS-4	Observation general	-	Frederiksberg (GEO 4)
CS-4	Consumer survey Geo 4	-	Frederiksberg (GEO 4)
MUT-4	Material user test	04/06/22	Frederiksberg (GEO 4)
RTBO-4	Average ranking table business owners Geo 4	-	Frederiksberg (GEO 4)

Annex 3. Disclaimer

KØBENHAVN **ØSTERBRO**

RESEARCH ON SINGLE-USE PLASTICS CONSUMPTION IN HOSPITALITY SECTOR



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European Workshop – ESA31306

Table of contents

Introduction

This report is one of the five reports about single-use plastic tableware for on-site consumption in the city of Copenhagen, Denmark. It specifically focuses on Østerbro, one of the districts of the capital. This document is based on the on-field research of master students from the University of Wageningen and Research conducted in Copenhagen on behalf of the non-governmental organisation (NGO) Oceana. The aim of Oceana is to address the problem of plastic ocean pollution through a legislative change.

Problem statement

Goods made of mainly fossil fuel–based chemicals that are set out to be thrown away after a single-use are known as single-use plastics (SUPs)[1]. SUPs products are convenient, and especially fast, since they can be disposed, and do not need to be washed after usage. However, they can damage the environment and are a threat for human health, for example through creating harmful microplastics and contaminating seafood. These are a few of the multiple reasons why SUPs should be phased out[2]. Oceana recently conducted a poll amongst a representative sample of the Danish population which showed that 90% of the respondents support the idea of reducing SUPs. Moreover, 75% of the respondents think that cafés and bars should offer consumers refillable options[3]. On 3rd of July 2021, the Single-Use Plastics Directive of the European Union (EU 2019/904) entered into force to limit the impact of certain types of plastic products on the environment. The goal of the Directive is to minimise the quantity of plastic waste, especially in the marine environment[4].

Oceana is dedicated to reduce SUPs ending up in our oceans. After they established a head quarter in Copenhagen, they identified issues of SUPs used in the hospitality sector ending up on the streets, and ultimately in the ocean. That is why Oceana wants to reduce SUPs consumption in the hospitality sector in Copenhagen. The capital of Denmark consists of different districts, of which one is Østerbro. In this report, this specific district will be researched.

Currently, according to our analysis, about 25,000,000 SUPs items per year are used in fast-food restaurants, cafés and bars/pubs in Østerbro. To reach the aim of Oceana, and also the goal of the municipality of Copenhagen to become a leader within the circular economy[5], this amount must be -reduced. As such, the purpose of this research is: ***"To identify social, legislative & economic barriers of and enablers to onsite SUPs consumption in fast-food restaurants, cafés and bars/pubs in Østerbro, Copenhagen."***

About the area

Østerbro is located close to the city centre, but still provides a green environment[6]. It has a surface of around 12 km^2, and with its 80,000 inhabitants, the residential area makes one of the biggest and most densely populated districts in Copenhagen[7]. Østerbro translates into "Eastern borough" or "Eastern Bridge", and owes its name from being located near the old eastern gate of the city. Nowadays, the signs of these landscapes are still observable in the huge park called Fælledparken: Denmark's largest public park. Østerbro was not built up as fast as the nearby districts Nørrebro and Vestebro, making the residential area more organised. The gentry class went to live in villas surrounded by greenery: a heritage that has remained in the district[8].

So, Østerbro is mainly a residential area, but is also typified by some excellent shopping and hospitality areas. Currently, Østerbro is known as the "Latté District" due to the demographic composition of the area, consisting

of young, liberal-minded, well-paid academics[8]. However, elderly and young children are also a large part of its high dense population. So, just like in the past, Østerbro is a wealthy neighbourhood. Despite the calm environment of the district, it is full of important monuments and places, such as, the Little Mermaid statue, the beautifully preserved Kastellet citadel, large cruise ships and various docks for small ferries[9]. Overall, Østerbro is a wealthy residential area that hosts many schools, plentiful houses, playgrounds, parks, day-cares, and kindergartens[10]. Based on our observations, there are few chains and many authentic bars and cafés. Moreover, shops are located broad boulevards, design shops and parks. To sum up, Østerbro is one of Copenhagen's most attractive and expensive living areas, with elegant shops and local venues.

Methodology

After receiving the commission of Oceana, we conducted literature research to receive an overview of the problem and the current situation of Østerbro. Furthermore, we prepared data collection methods to execute the planned fieldwork.

In Østerbro, we conducted 9 interviews with business owners to gain a better understanding of their perspective on the use of SUPs and reusable alternatives, and in the end determine the barriers and enablers. Furthermore, we collected 117 consumer surveys to receive better insight into consumers' daily practices and perceptions regarding SUPs consumption and reusable alternatives. Additionally, we observed participant's behaviours in 10 different establishments. The aim of the observations was firstly to triangulate the consumer surveys to further understand social practices, and to visualize characteristics and SUPs dynamics within the observed establishments. Lastly, we conducted 20 material-user tests to create a better perspective on consumers' preferences on different types of tableware. We presented sets of reusable traditional, reusable bioplastics, reusable plastics, and single-use plastics tableware which the respondents had to rank for personal preference (Annex 1).

The roadmap for the report

This report is divided in five chapters which follow five different themes related to the area of interest. The chapters are: i) What'SUP Østerbro? The shapers and their district, ii) The best pupil in class? iii) The fast and chain culprit, iv) The consumer wears the crown, and v) The sun comes out from the east: Østerbro avoiding the use of SUPPs. The first chapter describes the current situation of the area, how day to day social practices in the area shaped the SUPs consumption and introduces involved stakeholders in the SUPs issue. The second chapter analyses an emerged narrative in the hospitality sector of the district; the belief that they are doing an excellent job in becoming more environmentally friendly. However, here some issues arise related to the take-away and on-site consumption overlap, and the (lack of) acquired responsibilities. The third chapter narrows down the attention to fast-food restaurants and chains to analyse their high contribution to the SUPs issue in the district and identify the barriers that influence this situation. The fourth chapter addresses consumers' perceptions and behaviour, and analyses the influence of Østerbro consumers demand on the type of tableware offered by the sector. The last chapter presents an overview of best practices in the avoidance of SUPs by Østerbro establishments' and identifies key enablers of the district in the transition from SUPs to reusable tableware alternatives.

CHAPTER 1 | What'SUP Østerbro? The shapers and their district

Situated in the north-eastern part of Copenhagen, you can find the district of Østerbro. The densely populated district is known as hip but rather quiet, with many houses, playgrounds, parks, and a wide variety of local cafés where we found especially young families and students. Many of these and other food and beverage establishments can be found at the Østerbrogade, the high street of the district. Mainly residential buildings and parks dominate the rest of Østerbro. The greenery of the area reflects well the mindset of the people living there[10]. Based on our analysis results and observations collected during fieldwork in the district, the residents perceived themselves as well aware of sustainability issues within the hospitality sector. In between the residents, tourists rarely stray into the district, except for a few tourist spots that attract (inter)national visitors. However, residents from other districts value the calmness and greenery and therefore like to take a stroll through Østerbro, especially when the weather is good to enjoy a drink and a meal in the area.

Only sustainable preferences around?

Østerbro residents consequently shape the neighbourhood more than outsiders, which is also reflected in the ratio between cafés and fast-food chains. Whereas cafés and fast-food non-chains can be found every here and there, only a few fast-food chains have settled in the area. Touristic areas, such as the city centre, generally tend to have more fast-food chains than areas with less tourists[11]. As shown in Figure 1, the results suggest that the residents from Østerbro go to a fast-food restaurant only a few times per year, which also explains the district scape. This trend consequently shapes the offer and demand of SUPs for on-site consumption. According to their own statements, people from Østerbro pay great attention to sustainability and follow the wave of a green trend (CC-5.1; BAR-5.2). This is also echoed by many food and beverage establishments, which thus offer a lot of ceramics, porcelain, and glass as tableware instead of SUPs:

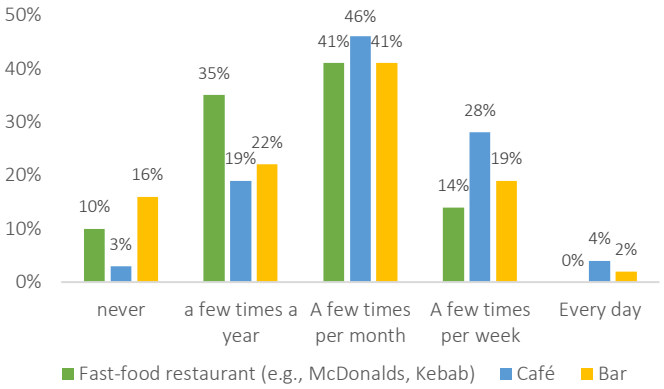

Figure 1. Frequency of visits of consumers per establishment.

> "Only an idiot would do that. I mean why use plastic if you can use ceramics?" - (C-5.1)

Food and beverage businesses in Østerbro place great emphasis on the demands and lifestyles of their customers, which is also visible in the business owners' preferences when it comes to the selection and range of tableware. And while consumers place a high value on reusable alternatives in most of the categories, they do not care about the tableware and packaging in fast-food establishments, which also corresponds to our findings. For example, in Østerbro, we discovered actual issues with SUPs consumption in chain establishments and fast-food non-chains. However, these still work frequently with SUPs as on-site tableware, and they perceive that it is more difficult to transition from SUPs to alternatives (FF-5.1). Contrary to that, we could also find chain establishments that ride on the green wave and follow the trend "which is on everyone's lips" (CC-5.1). Many business owners take this trend into account, which describes a more sustainable shift in the use of plastic within the hospitality sector (e.g., CC-5.1; FFC-5.1; C-5.1). Throughout the report, there is a detailed overview and explanation of all these topics.

Involvement in shaping the SUPs consumption

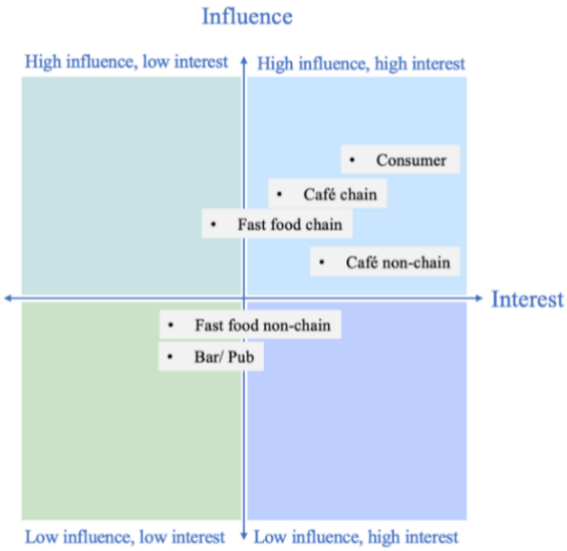

Figure 2. Stakeholder matrix of Østerbro.

As aforementioned, the residents and thus the consumers in Østerbro vastly shape the current state of the SUPs and general tableware usage within the district. However, the SUP issue for on-site consumption in food and beverage establishments encompasses various stakeholders who are involved in this fiddly network. Within our research, we uncover the extent to which different stakeholders, including consumers and business owners, influence the availability of SUPs and the level of interest they have in the discussion. For our general field research in Copenhagen, we defined business owners, consumers, NGOs, business associations and policymakers as key stakeholders. In the area of Østerbro, the business owners mainly serve the customers' demand, and the customers adjust to the current tableware offer from the business side. Therefore, in our research for the district, we focus in particular on consumers and business owners as they influence the status quo of tableware usage in the district the most (C-5.1, BAR-5.2).

Based on this Geo-report the outcome of the matrix (Figure 2) has been set. Within the next chapters the influence and the interests of the different stakeholders of the district will be elaborated on, which function as the base for the stakeholder matrix. The food and beverage businesses have been divided into the same categories mentioned in the Methodology section. Different patterns for different categories have been identified and will be further explained in the next chapters and are listed in Annex 2: Table of Influence & Interest.

Let's talk data

However, before analysing the involved stakeholders in detail, we introduce the key issue of this whole report. In order to illustrate the extent of the SUP issues in Østerbro, we present Table 1 the data that emerged from the general field research. The table shows the average amount of SUPs items used per consumer in each category in Østerbro and the whole of Copenhagen. To create this table, we made some estimations based on collected data about the plastic use of consumers from on-site observations in fast-food restaurants, cafés, and bars in the district and the city.

Table 1. Average amount of SUPs items used per consumer.

	Fast food chain	Fast food non-chain	Cafe chain	Cafe non-chain	Bars/pubs
Plastic wraps	2.00	0	0.10	0	0
Utensils	0	0.25	0	0	0
Straws	0	0	0	0	0
Storage containers	0.71	0.75	0	0.07	0
Cups	0.21	0	0.74	0	0
Cup lids	0.21	0	0.43	0	0
Stirrers	0	0	0	0	0
Plates	0	0	0	0	0
Drink bottles	0.07	0	0.12	0	0
Other (SUPs)	0	0	0	0	0
Total SUPs in Osterbro	**3.21**	**1.00**	**1.38**	**0.07**	**0**
Total SUPs in whole of Copenhagen	**1.82**	**0.75**	**1.32**	**0.27**	**0.31**

It becomes clear that Østerbro makes a big contribution to the SUPs issue within the city of Copenhagen. It has an average amount of SUPs used per consumer higher than the total average amount of the whole Copenhagen and for almost all the categories of establishments (except café non-chain and bars/pubs).

However, it must be taken into account that Østerbro is a densely populated district. Most of the SUPs in this district are found in plastic wraps, storage containers, cups and cup lids. Nevertheless, a large part of the hospitality sector and consumers of Østerbro considered themselves part of the environmental-friendly wave. Can Østerbro work as a best example with its sustainable-minded residents and demand-following business owners? Or is it instead just all talk and no action? To go further into these questions, the following chapter presents an in-depth analysis of the Østerbro hospitality sector.

CHAPTER 2 | The best pupil in class?

Despite the diversity of Østerbro's hospitality venues, a clear and dominant narrative emerges unanimously. Even though the use of SUPs differs significantly between the categories, they collectively believe they are doing a pretty good job in becoming more environmentally friendly. In this chapter, we will analyse the ways in which this narrative manifests itself. First, it looks at three perceptions that support this narrative, second, how take-away is used as justification for ongoing plastic use, and third, how the blame is pointed at other actors in the field.

'We are doing great with plastic!'

The first of the three perceptions emerge mostly in small, local cafés through values and norms surrounding SUPs use. It is simply 'not done' to use plastics, which is often connected to both environmental and aesthetic aspects. In fact, as shown in Table 2, business owners consider environmental criteria the most important when choosing a reusable alternative, followed by the appearance and design (look and feel). As one café owner clarified: "Eating of steel plates would feel like being in prison, and plastic feels like McDonalds." (C-5.1). We have found a few economic criteria in the middle, such as the operating cost for the businesses to maintain the reusable alternative. However, we have identified other economic criteria at the bottom of the list. This preference is clearly expressed in the way the same café owner explains their reasoning for using reusables: "But even if things are more expensive, and they are better for the environment, we feel better using them". (C-5.1). This quote adequately sums up the general interest of cafés owners in Østerbro.

Table 2. Average ranking preference of all interviewed venues in Østerbro for different criteria to be considered when selecting reusable tableware. The criteria were rank from 1 to 6, where 1 was the most important and 6 the least important.

Type of criterion	Criterion	Average ranking
Environmental	Less CO2 emissions over the lifetime of the reusable alternative	4,0 (Most preferred)
	Durability of the reusable alternative	5,0
	Less water needed to manufacture and re-use the alternative	5,0
Social	Look & feel of the reusable alternative for consumers	5,7
Economic	How fast the alternative can be introduced in the market	6,0
Social	Low health risks perception of the reusable alternative	6,2
Economic	Low operating costs for the businesses to maintain the reusable alternative	6,3
Social	Business-owner experience when using the reusable alternative	6,7
Economic	Low costs for the customers	6,8
	Short time before investment is recovered	6,8
	Low investment costs for the businesses	8,0 (Least preferred)

As mentioned before, using reusables on-site already makes the norm in most parts of Østerbro (see chapter 5). Our questions regarding plastic use have been sometimes met with surprise and disbelief. Another café only uses locally derived, vintage materials for their reusables. Phrasing it self-explanatory, the latter stated: "when it's vintage, it's low cost and sustainable." (C-5.2). Another café owner expressed it in a bolder way:

"I mean seriously, is there any restaurant in the world or cafés that uses plastic for serving on-site?" – (C-5.1)

The second perception is closely related to the first, but the difference is that the 'single-use' aspect is not perceived as the problem. Although plastics in Østerbro are perceived as harmful and unhealthy, the idea persists that other single use materials (such as paper and wood) equals environmental friendliness. In practice, most paper cups and bowls end up in landfill due to its small plastic layer[12], while pizza boxes that contain grease can no longer be recycled[13]. And then the transport, waste stream and massive amount of required materials are not even mentioned yet. However, this positive view on single use alternatives is also projected on the sector as a whole: "I mean, they're pretty great at becoming more sustainable (…) they make it like out of paper instead of plastic." (FFC-5.1). Again, aesthetics play an important role, because the look and the feel of paper is preferred over that of plastic. On the other hand, wooden cutlery and paper straws were more reluctantly accepted, but the environmental impact here – and recent regulations – overrule the user friendliness. Importantly, these perceptions are often apparent in venues that have a high take-away rate and for the sake of convenience also use these materials for on-site consumption.

Thirdly, venues that still work with SUPs tend to view them through the rose-coloured glasses of recycling. Recycling is seen as an important way to become more sustainable, mostly in the larger chains. This view is deeply rooted in the companies' current actions, but also in their future outlook. One chain owner explains that in the following way: "The bowls are 100% plastic recycled. The cups (…) are 40% at the moment. But by 2024, they will be 100%, that's the goal". (CC-5.1). The recycle rates of plastic tableware were often proudly announced, and sometimes confused with the concept of reusability. Referring to their plastic cups, one fast-food chain owner states: "85% we reuse it again" followed by, "not reuse because it is plastic, but recycle." (FFC-5.2). However, recycling is not the answer to the SUP waste crisis, since consumption levels are rising and waste streams increasing, while not all materials are actually recycled[14]. Observations show this applies mostly to juice and ice coffee cups, for which plastic seems the best material to keep the drink cold. Interestingly, this reasoning exists in both small local cafés and fast-food chains.

To sum up, although the problems of SUPs are widely acknowledged, there seem to be some misconceptions about what practices *can* be regarded as sustainable. This section has elaborated in detail on the influence cafés encompasses and how it is placed in the stakeholder matrix.

Take-away anyway

In general, Østerbro shows little discomfort about the SUPs still in use, either by its little percentage or by recycling rates. Both the plastic use and the notion about single use alternatives being a good sustainable option cannot be understood, however, without taking into account that many venues also provide take-away, for which SUPs are often conceived as necessary. Contrastingly, although SUPs for onsite consumption are limited (see for the exception chapter 3), with the materials available anyway, they often end up on site together with reusable alternatives. We observed how chains and fast-food venues quite arbitrary gave out either SUPs or alternatives.

Figure 3. Reusable and single-use materials. Credit: own material.

One manager who has two establishments in both Nørrebro and Østerbro, explained how he could not convince his manager to fully switch to reusable materials on-site in Nørrebro, while the venue in Østerbro provides these from the initial opening. The biggest difference between the two venues is that one in Nørrebro focusses mainly on to-go while the one in Østerbro focusses mainly on on-site. This shows how the perceived necessity of plastics (and other single-use materials) for take-away encourages its usage.

The blame game

Finally, something that flows directly from the different perceptions on plastic use described above is the question of responsibility. The fact that the businesses do not consider themselves to be a big contributor to the problem of SUPs, does not stand in the way of them acknowledging the problem in general and holding the ones they think are mainly responsible accountable. The main participants of this research actually do point fingers at each other.

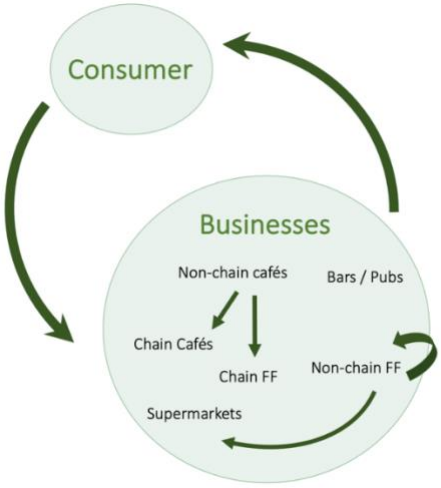

Figure 4. The blame game.

This 'blame game' starts with the smaller, local venues that use little to no SUPs, who mainly refer to the larger companies in the area. This is directed at both the café chains: "Yeah, I think they have a problem that they need solve. But the problem is that they think too much about money and not about the earth" (C-5.2), as well as at the supermarkets:

> "You go to for example, Netto and ask them, excuse me, how many bags have you given to customers? I think it's like thousands. So if I give two forks and knifes, that's even like 0.001 % to what they are using." - (FF-5.2)

The chains, while trying to change their plastic practice, largely reproach their suppliers, partly because their search for better alternatives is very difficult. At the same time, it does not seem that the conversation between chains and their suppliers has even started. As one fast food employee explains: "when we get our bagels, they are each packed in plastic. (…) I don't understand why they put it like this" (FFC-5.1). The chains are the only type of business that also refer to the customers wanting convenient materials (see chapter 4).

Overall, the idea emerges that small quantities of SUPs do not really matter, and that take-away and recycling justify the remaining plastic use. This, and the lack of awareness on the unsustainability of single use alternatives, conflicts with Østerbro positioning itself as the sustainable example. On top of this, business owners direct their action within the scope of their own venue and stop there. More integral actions are not undertaken, which hinders the steps forward that are needed to further limit SUP use. After all, this is as much a collective issue as it is an individual one, which does not stop at Østerbro's borders.

CHAPTER 3 | The fast and chain culprit

Many fingers point to the hospitality chains, but to what extent is this blame justified? To answer this question, this chapter discusses the theme of 'the fast and chain culprit'. This theme addresses the finding from our analysis which indicated that indeed, chains generally use more plastic than other categories included in the research. Østerbro perceives itself as the model student, and stakeholders don't identify too many barriers and issues with regards to the use of SUPs. However, one aspect pervaded our overall fieldwork: businesses and consumers alike find most barriers and issues within chains and fast-food restaurants. This makes them the perceived culprit in terms of SUPs use. The following introduces different data which analyse and uncover the roots of this issue.

Figure 5. SUPs lids and other single-use cutlery. Credit: own material.

Amount of SUPs per consumer

So, chains are perceived to be the culprit in the matter of SUP on-site consumption and the pointing fingers are also proven right. As shown before in Table 1 of Chapter 1, it appears that in general consumers of Østerbro and the whole of Copenhagen use more SUPs items in chains and fast-food restaurants than in the other categories. In fast-food restaurants, mainly wrap packaging and storage containers as SUPs are found. In the café chains, cups and cup lids are mainly used. This indicates the influence of both, fast-food and café chains on the general matter of SUP consumption in the district.

Consumer preference

The question now is: Why do these chains still use so many SUPs for on-site consumption? As can be seen in Figure 6, in Østerbro 24% of the consumers at fast-food restaurants prefer single-use tableware, and 37% do not have a preference. The rest do prefer reusable alternatives. People indicate that they prefer non-reusable tableware because of hygiene, convenience, and time savings. This result is surprising and contradictory as Østerbro is seen as an environmentally aware and politically correct neighbourhood.

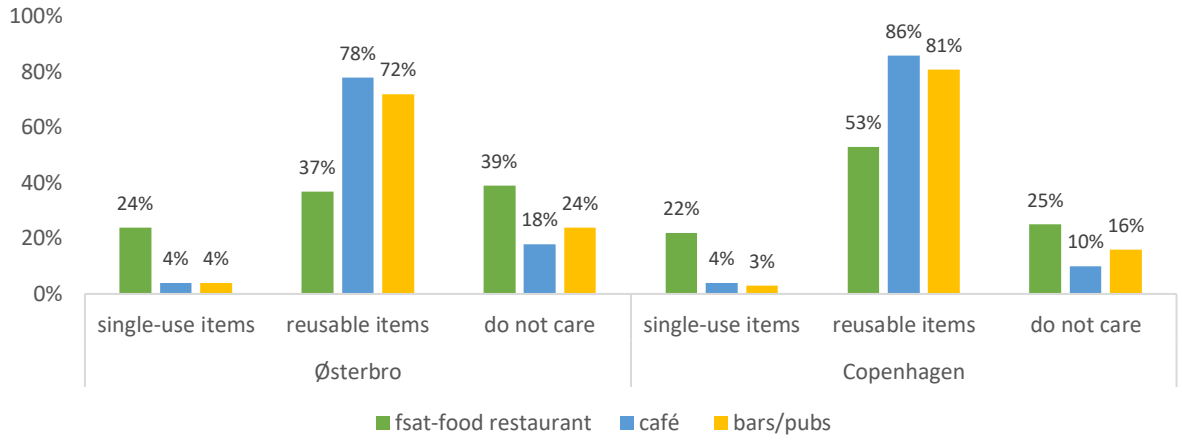

Figure 6.Comparison between consumers' preference for material of tableware in different type of venues in Østerbro and overall Copenhagen.

In both cafés and bars, the preference (78% and 72%) goes to reusable tableware because of for example environmental reasons, but also because reusable materials, such as glass or ceramic, feel more comfortable, look nicer and consumers are used to it. For example, someone indicated*: "I see it as part of the experience of eating in a café"* (original quote in Danish). Another person stated: *"When I eat in, the service must be glass, porcelain and steel"* (original quote in Danish). More elaboration of consumers would be discussed in chapter 4.

The fast culprit

In cafés and bars, consumer prefer reusable materials, so it is perceived to be only logical that business owners follow this demand. However, since consumers in fast-food restaurants prefer the convenience, hygiene and time savings of non-reusable materials, and the customer often wears the crown (see Chapter 4), business owners and managers tend to follow this specific preference. Also, the convenience and time savings are reason for the business owners to use single-use tableware in fast-food restaurants, because, as the name implies, it is about serving and consuming food in a fast manner. The combination of consumer preference and business owner's convenience makes the fast culprit a strong barrier.

Non-chain fast-food restaurants also use a fair amount of plastic in both Østerbro and the whole of Copenhagen, but not as much as in the chains. It appears from an interview with a fast-food restaurant non-chain that not every fast-food restaurant gives SUPs to their customers (FF-5.2). That is why plastic usage per

consumer is also lower, and why fast-food restaurants chains are the bigger culprit. From this paragraph the interest of fast-food chains and non-chains have been made clear and argues their position in the stakeholder matrix.

The chain culprit

Although consumers indicate that they prefer reusable tableware in cafés, chain cafés often still use single-use tableware according to the observations. This can be explained by the take-away overlap. The business model of chain cafés often includes take-away. As a result, some or all of the non-reusable tableware, what businesses actually use for take-away, is also used on-site. This is called the takeaway overlap (see Chapter 2). Cafés, especially chains, often also have takeaway coffee and other products, which explains why they use more single-use items per consumer, also on-site. This supports the finding of chain cafés being one of the culprits for SUPs use. This makes the takeaway overlap a barrier.

In conclusion, most SUPs per consumer are used by consumers of fast-food restaurant chains, followed by the café chains, and fast-food restaurants non-chain. Both consumers and business owners indicate that they prefer non-reusable materials in fast-food restaurants as they are hygienic, convenience, and time saving. Non-reusable materials are preferred because of hygiene, convenience and time savings by both consumers and business owners making it a possible barrier to shift towards reusable alternatives as both stakeholders rather have non-reusable materials. However, a larger group still prefers reusable materials, because they feel more comfortable, look nicer and for environmental reasons. This forms an enabler to shift towards reusable tableware.

The takeaway overlap explains why especially chains, both cafés and fast-food restaurants, use SUPs for on-site consumption. In this case, takeaway forms a barrier for businesses where takeaway is a (big) part of their business model.

Contrary to Table 2 from chapter 2 which shows the general preference of Østerbro venues, which care less about economic criteria and more about environmental impacts and the design (look & feel), the disaggregated results from specifically fast-food restaurants and café chains look different. As presented in Table 3, these specific venues considered economic impacts for business (short time before investment is recovered, low operating costs for the businesses, and low investment costs) more important than the whole Østerbro results. Also, the business-owner experience when using the reusable alternative is very important for them. On the other side, the cost for the customer, which was rank with a 6.8 score for the whole Østerbro venues, is the least important criterion in this case ranked with a score of 8.3

Table 3. Average ranking preference of interviewed fast-food restaurants and café chains in Østerbro for different criteria to be considered when selecting reusable tableware. The criteria were rank from 1 to 6, where 1 was the most important and 6 the least important.

Type of criterion	Criterion	Average ranking
Environmental	Less CO2 emissions over the lifetime of the reusable alternative	4,3 (Most preferred)
	Durability of the reusable alternative	4,5
	Less water needed to manufacture and re-use the alternative	5,3
Social	*Business-owner experience when using the reusable alternative*	*5,3*
Economic	*Short time before investment is recovered*	*5,5*

	Low operating costs for the businesses to maintain the reusable alternative	*6,0*
Social	Look & feel of the reusable alternative for consumers	6,3
Economic	*Low investment costs for the businesses*	*6,8*
Social	Low health risks perception of the reusable alternative	7,0
Economic	How fast the alternative can be introduced in the market	7,8
	Low costs for the customers	*8,3* (Least preferred)

As such, fast-food restaurants and chains form the culprits of SUPs consumption in Østerbro. This finding shows where the problem is mostly located, and where specific recommendations to reduce single-use plastic usage has the most effect.

In conclusion, it can be stated that fast-food restaurants and chains form the culprit of SUPs use in Østerbro. For the fast-food restaurants, consumer preference and convenience for business owners are the main reasons for single-use tableware usage in these establishments. That both consumers and business owners rather use single-use tableware forms a barrier to switching to reusable alternatives. Regarding chains, the takeaway overlap forms a barrier as even though single-use materials are not needed on-site, they are still used. It is difficult to reach and change chains as they are big corporations and decisions are made on a higher level. However, if you are able to make them change, it has a big impact as there are more locations, and thus more locations will make the switch towards reusable alternatives making this an enabler.

CHAPTER 4 | The consumer wears the crown

Figure 7. Material-user test. Credit: own material.

Although the former chapters have mostly focused on the supply-side of SUPs, they have already hinted on the strong influence of Østerbro customer demand. This section compares the real impact of customers' SUP usage and their behavior in the Østerbro region. According to interviews with business owners, consumer perceptions are a major determinant of whether they offer reusable or single-use tableware, thus we compare their influence with a crown on their heads, having the power to influence the decision about the types of materials used in different venues. However, our survey, material-user test and observational findings indicate that business owners' beliefs and consumers' actual actions do not always align, particularly in terms of different consuming locations and consumption hours.

The radiance of the crown

Meeting consumer demand is very important for all fast-food restaurants, cafés and bars and pubs. The owner of a bar said: "Østerbro is a 'political correct' district which prefers no plastics." (BAR-5.2), which means people are willing to be more environmentally friendly. Thus, most of venues also do not provide SUPs for on-site consumption anymore and they believe that this transition leaves a green trend impression on their consumers: "They get happy when they are using reusable tableware and are good for environment" (FFC-5.1). Under the preference change of consumers, local venues are pressured to replace the use of SUPs with reusable tableware. An owner said SUPs were popular few decades ago, but now it is not modern anymore. Using reusable and environmental-friendly material has become the green trend, so sometimes consumers would ask before ordering, or can be surprised by venues still using SUPs, as mentioned by a business owner:

"Changes come from consumers, sometimes they ask: 'Are you still using plastics?!!'" - Café owner -（C-5.1）

This means that consumers may not spend money at a place that still uses SUPs. So, the radiance from the crown has put a lot of pressure on business owners, which consequently invest in reusable alternatives, even if these have a higher cost.

At the same time, some business owners consider other factors that can attract customers when choosing new reusable materials, such as the design of tableware. There are many local owners running venues for consumers living in this area, an employee of a café said: "we have the same customers coming every day and they preferred vintage and cosy environment instead of mass places like Starbucks or Espresso House"(C-5.2). Therefore, they provide traditional ceramic tableware, which attracts a specific group to visit the venue and meet their demand of vintage reusable tableware. This explains the aforementioned narrative in chapter 2, in which it has been indicated that business owners mainly reasoning their choices through environmentally or design aspects. In our material-user test, we also found that traditional tableware is the most popular in Østerbro. When we asked participants to rank reusable traditional, reusable bioplastics, reusable plastics, and single-use plastics from the most preferred option to the least preferred one, 85% of them ranked traditional tableware as their favourite (see Figure 8). This may represent the crown on the heads of consumers is partly embellished with a traditional style of Østerbro (see chapter 5).

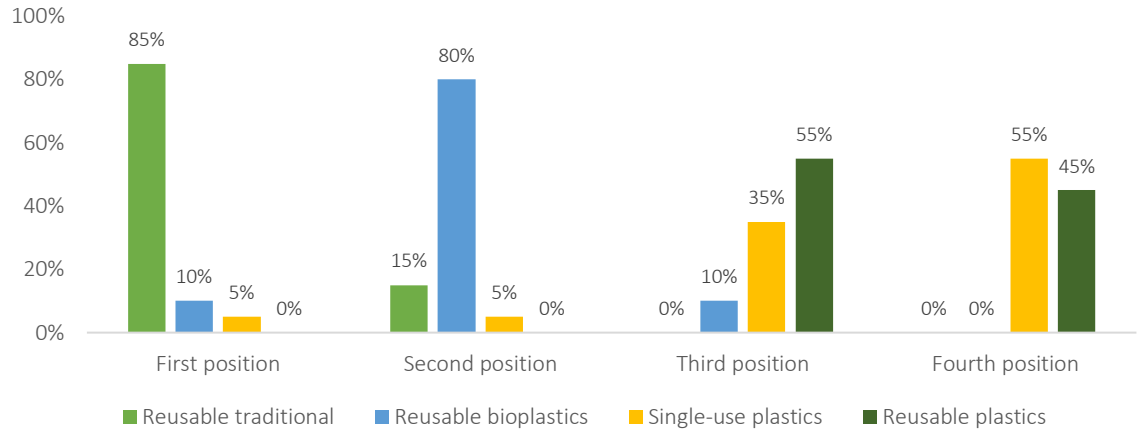

Figure 8. Consumers' ranking preference for different types of tableware, results obtained from the material-user test conducted in Østerbro.

A real crown or just a mask?

Although there is a consumer's demand of reusable and sustainable tableware, there also emerged some complaints about environmental-friendly tableware. After the European SUPs directive[15] coming out, plastic straws cannot be bought from suppliers anymore. Many businesses receive complaints from customers, because paper straws would gradually become soft when exposed to liquids and affect the taste, which again puzzles those who were happy to have met the expectations of their customers not using SUPs. A manager of a fast-food restaurant (FFC-5.2) in the area said they also received complaints about soggy straws, so sometimes they give consumers two paper straws, which increases the number of single-use items in general. Therefore, we find that consumers' selection would be influenced not only by environmental benefit but also by other elements such as price, different consumption times and places.

The results from surveys show that environmental benefits are the most important criterion for consumers to choose reusable tableware, then economic benefits are the second most important indicator, but design and appearance are ranked very low. On the other hand, in the material user test, participants also considered environmental benefits to be the most important, but when they described the reasons, they always

mentioned appearance and design as important and never mentioned economic benefits (MUT-5). Table 4 shows the average ranking gave by the participants in Østerbro for all the criteria.

Table 4. Consumers' ranking preference of different criteria for selecting a reusable tableware, average results obtained from surveys conducted in Østerbro. The criteria were rank from 1 to 6, with 1 most important and 6 least important.

Type of criterion	Criterion	Average ranking
Environmental	Environmental benefit	1,8 (Most preferred)
Economic	Economic benefit for the consumers	3,2
	Economic benefit for the businesses	3,7
Social	Convenience of use by businesses	4,0
	The look & feel of the alternative	4,1
	Alternative is ready to be used on a large scale	4,2 (Least preferred)

Additionally, customers could have varied preferences in various establishments, which are probably unconscious. Consumers are six times more likely to prefer disposable tableware at fast food restaurants (24%) than in cafés (4%) and bars (4%), as we mentioned in the chapter 3 (Figure 6). As a result, consumers are more likely to complete their food and beverages quickly when they enter a fast-food restaurant, which suggests that at these establishments, portability and convenience may take precedence over sustainable menu options. One of the reasons why fast-food establishments continue to offer SUPs when customers are present is because they are still meeting consumer demand. At addition, we found that "more sustainable" was mentioned about as often as "reusables are meant to be" when we looked at why customers choose reusable dinnerware in cafes and bars. This indicates that customers' preferences for tableware at the café or bar haven't really altered, but they could now interpret their everyday decisions from an environmental standpoint.

Crown's radiance is striving to minimize the usage of SUPs because local venues are under pressure from customers to comply with environmental expectations, whether they are making adjustments either actively or passively. However, the crown may then turn into the environmental mask that is removed when hurrying through a quick meal at a fast-food restaurant or simply enjoying a drink at a café or bar to relieve fatigue.

CHAPTER 5 | The sun comes out from the east: Østerbro avoiding the use of SUPs

Regardless of the issues we have identified in this report, Østerbro already does offer a lot of good examples regarding the avoidance of SUPs in food and beverage establishments and the use of reusable materials. The evidence we collected through interviews, surveys, material-user tests, and observations in the district suggests, although with some exceptions and limitations, that a big part of the Østerbro hospitality sector use reusable tableware for on-site consumption. There are many examples of cafés and bars that have never used SUPs, and other establishments are moving to reusable alternatives in their effort to phase out SUPs and other single-use materials. In the following section, we highlight the good features of Østerbro and use these to share best practices and identify enablers.

The "old-fashioned" traditional is the trend

It appears that most of the establishments we assessed serve food and drinks in either ceramic, porcelain, or glass. From the nine interviews conducted with cafés, fast-food restaurants and bar and pubs in Østerbro, 56% of them do not use SUPs while 44% use SUPs for on-site consumption. Moreover, for the 56% that do not use SUPs, this has been the scenario since the opening of the establishments, with the exemption of one café which used to have plastic straws in the past and then switched to paper straws. The amount and types of venues using SUPs and not using SUPs at all can be seen in Table 5.

Table 5. Amount and types of interviewed venues using or not using SUPs in Østerbro.

	Fast-food non-chain	Fast-food chain	Café non-chain	Café chain	Bar / Pubs
SUPs	1	1	1	1	0
No SUPs	1	1	1	0	2

Regarding the venues using SUPs, two of them use only one item and the other two use four items. In addition, one establishment using four items is transitioning from plastic for cold and hot drinks to glasses for cold drinks and porcelain for hot drinks. The reasoning behind this transition is because "it is better for the environment" (CC-5.1) and to serve customers demand, leaving a "good impression of the store – a green trend" (CC-5.1). The complete overview of the amount of different types of SUPs items used per category is shown in Figure 9. As can be seen in the figure, the chains are the ones using the highest amount of different types. Further information about the use of SUPs by the chains can be found in chapter 3.

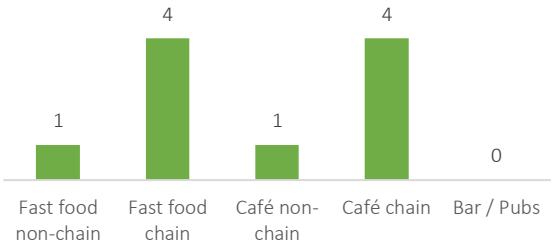

Figure 9. Amount of different types of SUPs items used per category in Østerbro.

Most of the interviewed venues in Østerbro use traditional tableware such as ceramics, porcelain, glass, and steel. Fast-food restaurants use mainly ceramic plates, metal cutlery and glass. However, in most of these establishments, the on-site consumption percentage is low, rounding at 20%. For cafés, the tableware materials do not differ to much from the previous, ceramic for plates and cups and steel for cutlery are the preferred materials. More specifically for ceramic tableware, there are venues who bought them new and venues who bought them second-hand from local vintage shops. An example of the reusable tableware used by one venue is presented in Annex 3: Reusable tableware observed.

The avoidance of SUPs by Østerbro's venues and the preference from business owners for traditional tableware is driven by the fact that this material presents the advantage of being very strong, thus the durability of the material is long (lifetime ranging from a couple of years to ten years), and it can be reused several times (C-5.1; C-5.2). Besides that, some of these establishments already have a dishwasher that allows them to more easily clean traditional-reusable tableware. The complete list of reusable materials used in the venues interviewed is presented in Annex 4: Reusable tableware most used by interviewed venues.

Østerbro unique characteristics shaping the SUPs reduction

There are two different kinds of motivation driving the use of reusable materials in Østerbro: internal and external motivation. On one hand, internal motivation referred to an inner environmental awareness growing in the hospitality sector of the district. Business owners and managers mentioned environment, environmental

impacts, environmental consciousness, and sustainability as reasons to use reusable tableware. Statements such as:

> "All of these things make my staff prouder to be here. Because we are always trying to be better ... So, I feel that the investment is not the money, part of it maybe, maybe that will never come back, you understand me? but the general feeling of the place is just way better" - (C-5.1)

So, the district wants to become and be part of the sustainable movement and ride on the green wave. On top of that, for some establishments it is important that their non-reusable tableware, for on-site or take-away consumption, is made of biodegradable or compostable materials. For example, in a café restaurant the owner explained that although they are using single-use paper cups and plastic lids for take-away, they are compostable (C-5.1) (see more about this topic in Chapter 2).

On the other hand, external motivation is related to external actors and aspects that influence or motivate the use of reusable tableware in the sector. Local Østerbro consumers are the external actors influencing this through their preferences for stylish and environmentally friendly or sustainable establishments (see more about this topic in Chapter 4). For external aspects, the design and functionality of the tableware motivate the use of reusable materials. These are important aspects that consumers take into consideration when going to a venue, and the hospitality sector is aware of it (see more about this topic in Chapters 2 and 3).

A combination of both types of motivation can result in a unique Østerbro characteristic: in terms of the economic impacts of reusable tableware, some business owners and managers believe that this is not important and the impact is not significant, hence "the business do not suffer from it" (FFC-5.2). As stated in an interview: "Recovering of an investment of buying paper straws instead of plastic… I don't think about such small details" (C-5.1). As it has been touched upon before, quite some business owners or managers do not care about the price of the materials but only about the quality. Additionally, some venues that use reusable tableware believe that it is better to buy traditional reusable materials just once instead of buying SUPs every time, as mentioned by a café manager:

> "We can't afford to do like Starbucks and all the big companies that just use plastics, it's too expensive and it's very bad for the planet" - (C-5.2)

More specifically, as mentioned in chapter 2, second-hand vintage ceramics are used by one café, who considered them to be low cost and attractive for customers. This, because of their designs and sustainability consonance, which gives the venue a "feeling of relaxed atmosphere" (C-5.2), in contrast to SUPs because "plastic looks and feels cheap" (FF-5.2).

All the four aforementioned aspects: i) intrinsic belief from business owners and managers in sustainability, ii) customers looking for sustainable establishments but with a certain style and appearance taste, iii) less importance to the economic cost of reusable or perception of SUPs to be more expensive, and iv) the current availability of special equipment such as dishwashers, are key enablers in Østerbro district that facilitates the phase-out or transition from SUPs to reusable materials.

These enablers can result from a combination of special characteristics of the district of Østerbro. According to a study about the sustainability profile for urban districts in Copenhagen, Østerbro has an overall high environmental performance in comparison to the average score of the whole Copenhagen[16]. In this same study, some of the indicators that score higher for the district are climate citizens (share of the population registered as 'Climate citizens', an internet-based forum for commitments to private climate initiatives) and urban sustainability politics, which can be explained by the unique characteristics of the district: occupied by "more well-off people with political correctness", many single-family houses and better access to green areas compared to other districts, which attract more wealthy families with higher purchasing economic capacity to, for example, buy a house[16].

Translating this to the case of the present study, chances are more reasonable in Østerbro for business owners and managers to make higher investments, economic efforts and adaptations in order to use reusable materials, as well as for consumers to afford the prices of 'sustainable and stylist´ venues. We observed this in the material-user tests and survey conducted to consumers. For the first one, we asked participants who chose a certain reusable tableware as they preferred one, how much more they are willing to pay for it. Only 26% were not willing to pay an extra amount, while the rest 74% were willing to pay more (see Figure 12a of Annex 5: Consumers' willingness to pay for reusable tableware). Furthermore, in the consumers survey we asked how much participants were willing to pay if an establishment would implement reusable tableware, results showed that only 37% were not willing to pay, while in contrast 63% of participants were willing to pay for it (see Figure 12b of Annex 5). Hence, Østerbro consumers are open to an increase in the price of reusable and sustainable tableware if it is required. However, also considering results presented in Table 4 of Chapter 4, the economic impact should not be too high.

As such, barriers such as the economic impacts for business owners and even for consumers, infrastructure, and equipment limitations are not very present in Østerbro for the transition from SUPs to reusable materials. Moreover, a large part of the district plays a good example in avoiding SUPs and implementing reusable options, more specifically reusable traditional tableware. However, other barriers presented in previous chapters should be overcome for a complete avoidance of single-use plastics and other single-use materials in order to maintain and increase the use of reusable options by the hospitality sector in Østerbro.

CONCLUSION

Østerbro is a wealthy and densely populated district in Copenhagen, characterised by its large residential area. The district is known by their demographic composition of well-academic young people and it is characterized by its greenery area, which reflects the environmental-aware mindset of the people living there. However, we found that about 25,000,000 SUPs items per year are used in fast-food restaurants, cafés, and bars/pubs in Østerbro, making a high contribution to the SUPs issues in the city.

This high amount of SUPs used in the district is influenced by barriers related to two main actors: business owners and consumers. We found that both actors pointed out at the convenience of SUPs given its ease and speed of use for both workers and consumers, even more when it comes to preparations and consumption in short times. Therefore, fast-food restaurants and chains posed the strongest barriers in the reduction of SUPs within our research area. Also, the business owners' perspectives, the misconceptions about sustainability and business models, influenced by take-away consumption, hinder the transition from SUPs to reusable alternatives.

On the other hand, barriers such as economic impacts either for business owners or consumers, infrastructure and equipment limitations are not very present in Østerbro. As such, our results showed a high percentage of establishments using reusable traditional tableware. This is allowed by the unique characteristics of the district: wealthy area, population with better purchasing economic capacity, environmental awareness from the people living, the taste for sustainable and stylish venues, less importance to the economic cost of reusables, and the current availability of equipment such as dishwashers. All these aspects work as enablers helping to meet an environmentally friendly future for Østerbro. However, this might be just the beginning of a complete transition from SUPs and other single-use materials to reusable options. All the hospitality sector in Østerbro and other stakeholders should keep working in coordination to overcome the barriers present in the district and maintain the reusable materials as the norm in Østerbro and further in the city of Copenhagen.

Annex

Annex 1: Picture of the tableware sets used for the material-user test

Figure 10. Set of tableware used for the material-user test.

Annex 2: Table of Influence & Interest

Table of Influence

Table 6. Identification of specific influence of certain stakeholder. The table functions as foundation for the stakeholder matrix.

Chains	Chapter 3
Non-chain	Chapter 2
Consumers	Chapter 4

Table of Interest

Table 7. Identification of specific interest of certain stakeholder. The table functions as foundation for the stakeholder matrix.

Chains	Chapter 2 & 3
Non-chain	Chapter 2 & 3
Consumers	Chapter 4

Annex 3: Reusable tableware observed

Figure 11. Traditional reusable tableware observed in a venue in Østerbro.

Annex 4: Reusable tableware most used by interviewed venues

Table 8. Reusable tableware used by the interviewed venues in Østerbro.

Reusable tableware	Type of material
Plates	Wooden, ceramics, porcelain
Cutlery	Metal/Steel
Cups	Glass, ceramics, porcelain

Annex 5: Consumers' willingness to pay for reusable tableware

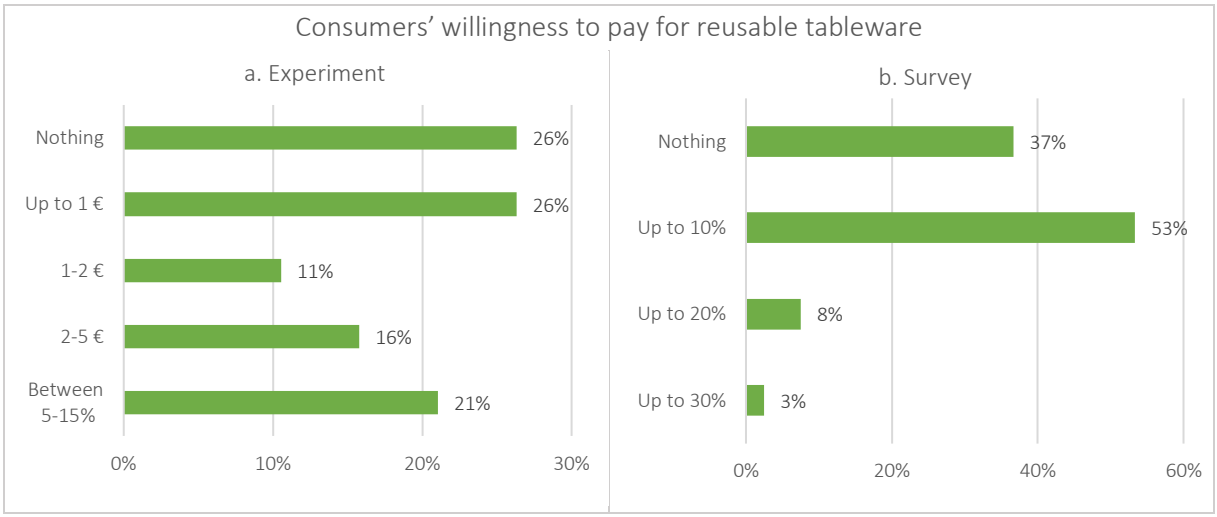

Figure 12. Consumers' willingness to pay for reusable tableware. Figure a shows the results for the material-user test conducted in Østerbro, in which we asked about the willingness to pay for a given preferred reusable tableware. Figure b shows the result for the survey made to participants in Østerbro, about the consumers' willingness to pay if an establishment would implement reusable tableware.

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