



CONSUMERS' AWARENESS AND BEHAVIOURAL CHANGE

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List of abbreviations and acronyms

Acronym	Meaning
AMAT	Agenzia Mobilita' Ambiente E Territorio Srl
ANTWERP	Stad Antwerpen
BPOST	bpost
EUC	Eurocities Asbl
GA	Grant Agreement
IKEA IT	Ikea Italia Retail Srl
IKEA NO	Ikea As
IPR	Intellectual Property Rights
JUMBO	Jumbo Supermarkten Bv
KER	Key Exploitable Result
LSP	Logistic Service Provider
OSLO	Oslo Kommune
RIAB	Research and Innovation Advisory Board
RUG	Rijksuniversiteit Groningen
SODE	Magma Srl Impresa Sociale
TNO	Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Tno
TOI	Transportøkonomisk Institutt
TORFS	Torfs L
TRT	TRT Trasporti e Territorio Srl
TTM	Transtheoretical Model of Behavioural Change
UTRECHT	Gemeente Utrecht
VUB	Vrije Universiteit Brussel

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Abstract

The rise in e-commerce delivery rates has significant societal consequences. These include environmental impacts, such as pollution and greenhouse gas emissions, as well as consequences on well-being and public health due to increased traffic volume, congestion, noise, and risk of injury from accidents. Mitigating these negative outcomes requires adapting delivery methods by transitioning to less polluting and safer transport modes, improving shipment consolidation, increasing the well-being of both delivery workers and enhancing liveability. Consumers' choice of delivery option during online shopping, currently driven by price and convenience, plays a critical role in the success of these efforts.

This deliverable aims to understand how consumers become aware of the consequences of e-commerce deliveries and returns and explores behavioural change processes leading them to choose more sustainable options. Based on 21 biographical interviews conducted with consumers from four European countries (Belgium, Italy, the Netherlands, and Norway), the findings reveal that:

- Consumers have little or only partial understanding of the effects of delivery on sustainability.
- Consumers with limited interest in sustainability concerns are not aware of the differences in environmental and societal impacts among delivery options.
- Retailers and public authorities play a minimal role in enhancing consumer awareness, despite their potential to address these issues.
- Awareness of the consequences of deliveries and returns can trigger behavioural changes, but only when it aligns with pro-sustainability values or is supported by opportunities such as convenient or cost-effective delivery options.

This research contributes to a deeper understanding of the behavioural processes underpinning the adoption of sustainable delivery and return practices.

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Executive Summary

The rapid growth in e-commerce has reshaped consumer habits offering unparalleled convenience but also introducing pressing societal challenges. With delivery rates rising rapidly, the environmental burden—manifested in increased pollution, greenhouse gas emissions, and congestion—is escalating. These impacts extend beyond environmental concerns to include threats to public health, such as rising noise levels, traffic stress, and safety risks.

In that context, CodeZERO project seeks to co-create sustainable and zero-emission last-mile delivery and return solutions for e-commerce that align with consumers' preferences while being sustainable for retailers, logistics operators and local authorities. The project also intends to provide communication guidelines to engage consumers and tools for local authorities to promote sustainable delivery and return options.

This deliverable (D2.2) provides valuable insights into **consumer awareness** regarding the societal impacts of their online orders—specifically delivery and return choices—and explores **behavioural change processes** towards choosing more sustainable delivery and return options.

Released as part of “WP2: Analysis of consumers' behaviour”, this deliverable contributes to an iterative and mixed-methods approach to better understand consumer preferences and behaviours when ordering online and selecting delivery options. The findings will inform key performance indicators (KPIs) in WP3 to assess consumers' behavioural change and serve as the foundation for drafting preliminary communication guidelines in WP4.

This deliverable explores the following critical questions:

- How aware are online consumers about the consequences of e-commerce deliveries and returns on society?
- To what extent does consumer awareness of sustainability impacts of delivery options result in change in online shopping behaviour and choice of delivery option?
- What triggers behavioural change (i.e. choosing more sustainable delivery options)?
- How does behavioural change occur?

The approach adopted in this deliverable is based on **biographical interviews**, situating consumers' delivery and return choices within the broader context of their individual life trajectories.

A total of 21 interviews were conducted with online consumers in Belgium, Italy, the Netherlands, and Norway, countries of CodeZERO pilots. To capture a nuanced understanding of consumer awareness and behavioural change, the sample was diversified based on awareness levels and engagement with sustainability. This approach aligns with the personas being developed in forthcoming Deliverable 2.1, which are informed by factors such as motivation and opportunity, rather than sociodemographic attributes like age, income, or education. While some sociodemographic categories were underrepresented, the sample still reflects diversity in these dimensions.

All the interviews were transcribed in full using an automated transcription tool and the transcripts were analysed thematically with focus on the several themes:

- awareness on delivery and return impacts,
- awareness evolution over time,
- behavioural change processes,
- adaptation strategies,
- life stages and key events in online consumption.

When it comes to the **findings**, the interviews reveal that while consumers have some awareness of issues related to online shopping, the impacts of last mile delivery remain a significant blind spot, especially for individuals with low pro-sustainability values. Even when consumers are aware of the challenges posed by online deliveries and returns, this awareness tends to be fragmented, focusing on specific aspects rather than the broader picture. As a result, our findings suggest that consumer knowledge about e-commerce impacts is relatively patchy and incomplete.

Consumers report becoming aware of these issues through **various channels**, including news and documentaries, their studies or professional experiences, social networks, personal encounters with delivery consequences, and their environmental awareness or reasoning. Awareness is not instantaneous; it is built gradually over time, often through multiple channels. However, the interviews reveal a critical gap: retailers, public organizations, and authorities play a limited role in informing consumers. This lack of engagement presents a significant opportunity for these stakeholders to raise consumer awareness about the impacts of e-commerce.

Despite awareness of last mile delivery issues, the deliverable reveals that some consumers remain in the contemplation stage, where they recognize the problem but do not take steps to change their behaviour. However, this stage presents an opportunity, as small, targeted incentives could nudge these consumers toward more sustainable delivery choices. For instance, reducing the convenience of home delivery or increasing its fees might be sufficient to motivate consumers identified as "uncommitted consumer" in forthcoming D2.1. For consumers with strong pro-sustainability values – the "pro-sustainable consumers" from D2.1- awareness can act as a powerful trigger for behavioural change. Yet, even for these consumers, adapting their behaviour often requires compromises, underlining the difficulty of change for those less concerned about sustainability.

In addition, as consumer awareness is typically fragmented, with a focus on specific issues rather than the broader context, this implies that even committed consumers may exhibit unsustainable behaviours in areas they are less informed about.

The deliverable also emphasizes that factors beyond awareness can influence behaviour change. Life events, social networks, and opportunities to act sustainably all play a role in driving change. Nevertheless, significant barriers persist, notably the convenience and cost of sustainable options. The findings underscore a critical insight: **awareness alone is insufficient to drive change**. It must be paired with pro-sustainability values or the availability of convenient, cost-effective sustainable delivery solutions to effectively foster behavioural shifts.

The findings from this deliverable lead to the following recommendations:

- **Engaging consumers through targeted strategies:** Develop targeted campaigns to raise consumers' awareness about the environmental and social consequences of their delivery choices and highlight the availability and advantages of sustainable alternatives.
- **Develop retailer and policy interventions:** Retailers and public authorities should take a more active role in promoting sustainable delivery options through transparent and trustworthy information.
- **Make sustainability convenient:** Develop solutions that align sustainable delivery options with consumer priorities, such as affordability and convenience, to encourage widespread adoption.

By understanding the factors that shape consumer awareness and behavioural change, this research provides valuable insights for better communicating to consumers about the societal impacts of e-commerce deliveries and incentivizing their choices.

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1 Introduction

1.1 About CodeZERO

CodeZERO is a three-year Horizon Europe research project aiming to co-create **sustainable and zero-emission last-mile delivery and return solutions for ecommerce** that align with **consumers'** preferences while being sustainable for **retailers, logistics operators** and **local authorities**. Additionally, the project is focused on providing clear, consumer-friendly communication and developing tools for local authorities to promote eco-friendly behaviour.

CodeZERO is articulated in four phases:

- An **ANALYSIS** phase which provides (1) an analysis of existing delivery and return options and an understanding of how they are shaped by the needs and constraints of all involved stakeholders; (2) an in-depth intersectional analysis of various groups of on-line consumers to understand what are the features of delivery and return options making them attractive, with the aim to identify mechanisms to incentivize behaviour changes; and (3) develops an assessment framework to measure the impacts in the environmental, economic and social domains of new solutions.
- A **DESIGN** phase, in which CodeZERO engages in a co-design process involving retailers, transport operators, consumers and local authorities in developing (1) guidelines for retailers to raise awareness among consumers; (2) a set of zero-emission and sustainable delivery and return options for retailers and transport operators; and (3) a toolset for local authorities to accelerate the transition towards sustainable solutions in last mile consignments in e-commerce.
- A **TEST** phase running four pilots in four different European cities in Italy, Netherlands, Belgium, and Norway to test a set of sustainable solutions identified in the previous phase with the aim to prove their feasibility, to fine-tune their design and to assess their impacts from the perspective of all stakeholders.
- A **CONSOLIDATION** phase where (1) CodeZERO outcomes are fine-tuned based on the lessons learned from real life applications, (2) requirements for up-scaling of solutions at European level are discussed (3) recommendations are formulated and (4) directions for future research are outlined.

Engagement with consumers and retailers' associations, industry stakeholders, cities and researchers contributes to shaping project results.

Running from June 2024 to May 2027, CodeZERO is organized along eight WPs:

- WP1 Analysis of current delivery models
- WP2 Analysis of consumers' behaviour
- WP3 CodeZERO assessment framework
- WP4 Design of CodeZERO solutions
- WP5 Testing solutions: CodeZERO living labs
- WP6 Conclusions and recommendations
- WP7 Dissemination, communication and exploitation
- WP8 Project management.

1.2 Aim of this deliverable

The purpose of this deliverable is to understand how consumers become aware of the societal impact of their online orders, including delivery and return options, and to what extent this awareness can lead to more sustainable choices. The findings from this deliverable are needed for developing CodeZERO communication guidelines. Beyond the project's outcomes, the aim is to provide valuable knowledge to society on whether increasing consumer awareness can lead to more sustainable delivery options being chosen and to potential measures to increase awareness.

To this purpose, we explore how consumers' awareness is shaped over time and how it can influence making more sustainable choices. Furthermore, we explore life factors influencing whether consumers opt for sustainable delivery of their online purchases. Consumers have varying awareness of the sustainability impacts of the choices that they make, and they are at different stages of behavioural change. Measures aimed at changing consumer behaviour need to account for these variations.

Our aim in this deliverable is to facilitate strategies that increase consumer demand for sustainable delivery options by understanding i) consumer awareness of societal impacts of online shopping and delivery, and ii) triggers that progress consumers towards choosing sustainable delivery options.

Released as part of “**WP2: Analysis of consumers' behaviour**”, this deliverable presents the results of Task 2.2. The findings will contribute directly to refining personas in **Deliverable 2.1**, while also informing the design of the survey for **Deliverable 2.4**, whose results will be analysed in **Deliverable 2.5**.

Beyond WP2, this deliverable provides valuable inputs for other work packages. Specifically, the insights from Deliverable 2.2 will be translated into KPIs to assess consumers' behavioural change in **Deliverable 3.2** and will serve as a foundation for drafting the preliminary communication guidelines in **Deliverable 4.3**.

The document is structured as follows:

- Chapter 2 introduces the research context and questions.
- Chapter 3 presents the methodological approach as well as the material collected.
- Chapter 4 provides an overview of consumers' awareness regarding the consequences of online shopping deliveries and returns.
- Chapter 5 explores the behavioural change process of consumers who have adopted more sustainable delivery or return options.

2 Context and research questions

2.1 The societal consequences of e-commerce deliveries

The increasing frequency and diversity of e-commerce deliveries can have negative consequences for society. These include environmental impact due to increased pollutants and greenhouse gas emissions and impact on population health and well-being due to increased stress from traffic, congestion, noise, and traffic risks. The following factors should be accounted for when considering the sustainability of e-commerce deliveries:

- **Gas emissions and pollution:** E-commerce and deliveries are a contributor to EU's transport related greenhouse gas emissions. According to Ignat and Chankov (2020), the environmental sustainability of last-mile delivery primarily concerns the impacts of road freight transportation, including air pollution (e.g., SO_x, NO_x, CO), greenhouse gas emissions (e.g., CO₂, CH₄), noise pollution, and congestion-related fuel waste (Demir et al. 2015). Even though e-commerce can reduce emissions through reduced travelling for consumers (Rao et al. 2021), the timely and speedy delivery of goods and competition in logistics services results in faster and more frequent delivery services, responsible for an increase in fuel consumption and emissions (Yuan et al. 2022).
- **Packaging:** Another significant factor is product packaging, particularly the environmental toll of plastic waste and non-returnable packaging (Freitag and Kotzab 2020).
- **Traffic risks:** The growth of e-commerce may also be altering the nature of traffic safety threats in urban areas. In a study in the United States, it was found that fatalities and nonfatal injuries from freight-involved crashes in urban areas are rising more rapidly than overall road traffic-related rates, with injuries increasingly occurring on local roads and arterials (McDonald, Yuan, and Naumann 2019). Despite decreases in overall traffic fatalities, safety remains a significant challenge in freight movement (Sedor and Caldwell 2002; Giuliano, Kang, and Yuan 2018).
- **Societal impact:** The social sustainability of last-mile delivery can be assessed from three key perspectives: the warehouse workers, the carrier drivers, and the general population.
 - For warehouse workers, the increase in e-commerce deliveries has made their workplace hazardous, exposing them to greater risks of injuries and accidents. The use of technologies to boost productivity could also heighten the potential for ergonomic risks (U.S. Government Accountability Office, 2024).
 - For carrier drivers, the social impact is shaped by employment type, working conditions (e.g., schedules and wages), and benefits (e.g., insurance and training). However, drivers often face worsening conditions, such as lack of fixed contracts, below-minimum wages, and no health insurance (Wall 2024). They also endure uncompensated time and costs, such as undelivered parcels or delays due to congestion.
 - From the general population's perspective, the increasing volume of deliveries leads to traffic congestion, accidents, noise, illegal parking, and longer public transport delays, imposing a broader strain on public infrastructure and quality of life (Ignat and Chankov 2020). Evidently, increased flexibility and convenience of delivery and return options increases quality of life for some consumers, but failed deliveries, occurring when the consumer was not home to receive the goods, result in additional trips, consequently higher congestion and pollution. Furthermore, the quality of life is compromised by the growing number of last-mile deliveries resulting in more traffic jams and accidents, waiting times in public transport, vehicle noise and illegal parking practices (Ducarme and Agrell 2019), thus creating a strain on public traffic and a negative social impact on the population as a whole. World Economic Forum (2020) predicts an extra 11 minutes for commuting and a 30% increase in carbon emissions by 2030 without effective intervention.

The European Green Deal aims to improve the well-being of people and includes an ambitious goal of achieving a 90% reduction in transport emissions by 2050 (European Commission 2020). Innovative solutions in e-commerce can play a key role in mitigating the above negative effects associated with last-mile deliveries. Solutions such as pick-up points and locker systems, consolidation of deliveries, minimizing distance and delivery stops, longer delivery windows and use of cargo bikes can mitigate the negative impact of last mile deliveries and improve the sustainability of e-commerce (Viu-Roig and Alvarez-Palau 2020; Deutsch and Golany 2018; Seghezzi, Siragusa, and Mangiaracina 2022; Manerba, Mansini, and Zanotti 2018). But the success of such delivery and return options is contingent upon their adoption by online consumers. Retailers, transport operators and policymakers have the ability to influence consumer choices but achieving this requires a deeper understanding of the factors that drive online consumers to opt for these delivery methods.

2.2 Consumers' willingness and ability to adopt sustainable options

2.2.1 Consumers' preferences for delivery and return options

64% of European e-shoppers currently prefer home delivery (Statista 2024). Price and convenience have been shown to be the most important delivery features for consumers. Low delivery price is preferred by most consumers (Buldeo Rai, Verlinde, and Macharis 2018; Nguyen et al. 2019). Convenience, defined as the time and effort saved by consumers during the shopping process, has become a primary motivator for online shopping decisions (Kruh et al. 2017) and a crucial factor influencing consumers' intention to repurchase online (Arya, Paul, and Sethi 2022; Fernandes et al. 2022; Jiang, Yang, and Jun 2013). Research by Berry et al. (2002) and Seiders et al. (2007) emphasizes the significance of convenience in the service economy, noting that non-monetary costs like time and effort strongly influence perceived convenience. Other attributes of delivery options, such as punctuality, tracking of shipment, etc. are also valued by consumers and influence their choices. They are presented in detail in Deliverable 1.1.

2.2.2 Consumers' behavioural change

Raising consumer awareness about the environmental and social benefits of such systems can also influence consumer behaviour (Viu-Roig and Alvarez-Palau 2020). Studies show that highlighting the sustainability impacts of last-mile deliveries can encourage consumers to adopt greener options, such as using pickup points (Ignat and Chankov 2020).

Communicating the benefits of more sustainable options to raise awareness and form positive attitudes in consumers towards such deliveries can facilitate their behaviour change and significantly affect their willingness to pay more and wait longer for green deliveries (Polinori et al. 2018; Schniederjans and Starkey 2014; Ignat and Chankov 2020; Buldeo Rai et al. 2021; Kokkinou et al. 2024).

Change in behaviour, however, depends on the consumer having the motivation and opportunity to change (facilitators and barriers) - and that they can break old habits (Klockner, 2013). Attitude change campaigns can help with dishabituation and formation of new habits (Verplanken 2018). A thorough literature review on consumers' behavioural change strategies and drivers will be presented in Deliverable 2.1 currently under preparation¹.

2.2.3 Stages of behavioural change

Changes of behaviour have been theorised by Prochaska and Velicer (1997) who presented the Transtheoretical Model of Behavioural Change (TTM) that highlights the stages involved in behavioural modification. The TTM was developed to study addictive behaviours, such as quitting smoking (Prochaska and DiClemente 1983) but has also been used to understand consumption changes (Coulson 2000; Rapley and Coulson 2005). The five stages included in the TTM are:

¹ To be delivered in May 2025.

1. **Precontemplation stage:** the consumer does not consider changing behaviour.
2. **Contemplation stage:** the consumer is thinking about changing behaviour, he/she evaluates pros and cons and has ambivalent feelings about change.
3. **Preparation stage:** the consumer has decided to change through taking specific actions.
4. **Action stage:** the consumer takes action and makes (visible) changes in his/her choices, routines and habits.
5. **Maintenance stage:** the consumer is committed to sustaining the change over time and prevent relapse through being confident that one can maintain the change.

The TTM considers that behavioural change is a cyclical process where people can stay at an early stage of change for a long period of time and can also relapse back to the beginning of the process, when facing barriers or challenges (Bamberg and Schulte 2018).

When studying changes in food habits, Lechner et al. (1998) introduced a distinction between those in precontemplation who are either aware or unaware of their problematic behaviour. This distinction is relevant to use in our analysis.

2.2.4 Consumer personas and resonance with behavioural change stages

In Deliverable 2.1, four key consumer personas are identified, based on consumers' motivation levels and opportunities for engaging in sustainable behaviour. This is built on the work by Verplanken (2018) and Cauwelier et al. (2024). The four key consumer personas identified hereby are as follows:

- The **pro-sustainable consumer:** This consumer is intrinsically motivated to continuously support sustainable practices. They seek out and prioritize green delivery despite the higher costs. They are driven by the need for continuous improvement and innovations that align with sustainability goals. Goal setting, community engagement, sharing experiences are typical behavioural strategies for this group which implies that giving them the platform to do so can increase their impact on their peers.
- The **uncommitted consumer:** This consumer typically has access to sustainable options of delivery and return but prioritizes convenience and cost, showing a lack of motivation to select environmentally friendly options. The salient motivator is the immediate benefit and convenience. Therefore, simplifying the process of choosing sustainable solutions and targeted incentives and showcasing peer engagement in sustainable practices can trigger behaviour change in this group.
- The **ignorant consumer:** this consumer is willing to adopt sustainable practices but either lacks awareness or access to such solutions. They engage in these behaviours when information communication is simple and organized and when the solution has been made readily available to them. Showing personal and community benefits of sustainable options and facilitating their access to sustainable products and services facilitate behavioural change.
- The **careless consumer:** this consumer is low on awareness and motivation to learn and engage in environmentally friendly behaviour if that compromises convenience and cost. Adoption of sustainable solutions can be triggered through incentivized campaigns that make sustainable practice look appealing, simplification of sustainable choices and highlight immediate personal benefits.

When trying to place the personas in the TTM, it is rather obvious that the pro-sustainable consumer is in the action and maintenance stages. On the contrary the three other personas have not really engaged in behavioural change and can be considered in pre-contemplation stage with different levels of awareness and motivation in combinations that do not trigger an actual change in their delivery choices. This implies the complexity of the interaction of internal and external factors that hinder the adoption of more sustainable delivery and return choices and points to the need for more research.

2.3 Research questions

Within the scope of the CodeZERO project, "sustainable delivery option" refers to a way of delivering an online purchase that does not harm society. It can be more friendly to the environment, provide more equitable working conditions, support local businesses or be safer than traditional delivery methods.

Most research on sustainable delivery options has focused on the innovation on the supply side and the logistics and retail actors such as use of micro hubs and parcel lockers. The benefit of these solutions, however, depends on demand i.e. on the consumers' adoption and use of these interventions.

Surprisingly, even though it has a significant impact on the environment, through packaging waste, transportation costs, free return policies, consumer behaviour has received less focus in literature (Cauwelier et al., 2024). Today little is known about consumers' awareness of the societal impacts of e-commerce deliveries, and there is a lack of understanding about the extent to which this awareness can affect their online shopping behaviour. The "green behaviour gap", which describes how consumers can express sustainability attitudes that poorly match behaviour, attests to the fact that awareness alone may not suffice to entice change (Park and Lin, 2020). Therefore, there is the need to understand what triggers can help transition awareness into action and how.

In this context, this deliverable is addressing the following research questions:

1. How aware are online consumers about the consequences of e-commerce deliveries and returns on society?
2. To what extent does consumer awareness of sustainability impacts of delivery options result in change in online shopping behaviour and choice of delivery option?
3. What triggers behavioural change (i.e. choosing more sustainable delivery options)?
4. How does behavioural change occur?

3 Methodology

3.1 Methodological approach

When choosing delivery or return options, online shoppers can be considered as consumers of a logistics service. Changing consumption habits proved to be challenging as it is not always the simple and immediate result of changes in motivation or attitude. Consumption changes often happen during more complex processes where different elements favour and trigger the change. Sociology of consumption has shown that such changes often coincide with biographical events (E.g., birth of a child, life as a couple, moving house or starting a new job) that can trigger households to reassess their behaviour at these moments and being more open to change (Plessz et al. 2016; Hand et al. 2009; Lamine 2008).

Biographical events are not enough to explain the adoption of new consumption behaviours which can also result from decisions that are socially influenced (Van Droogenbroeck and Van Hove 2020). In other words, changes in consumption are not only the result of rational individual choices: culture and social norms also play a role (Dubuisson-Quellier and Plessz 2013; Trizzulla, Garcia-Bardidia, and Rémy 2016). Habits can also help predict our behaviours and choices. Consumers do not re-evaluate every parameter influencing a decision each time they are choosing something. Some behavioural choices are made automatically, in response to familiar cues. Habits have been shown to be important predictors of environmental behaviour, for example regarding travel mode choice, energy use or organic food purchase (Klößner and Verplanken 2018). Finally, changes in consumption also have to be compatible with everyday life and with social meanings (Jaeger-Erben and Offenberger 2014).

To address the complexity of behavioural change, this deliverable is trying to better understand changes in deliveries and returns choices when shopping online, by placing them into the long-term context of consumers' individual trajectories. The method used is inspired by the biographical approach. Interviews have been conducted with consumers to understand their delivery and return choices in a long-term perspective. This kind of approach has already been used to study changes in mobility behaviours (Cailly, Huyghe, and Oppenchain 2020; Belton Chevallier, Cacciari, and Aguiléra 2023; Müggenburg, Busch-Geertsema, and Lanzendorf 2015), but it has not yet been used to study changes in delivery and return choices made by online consumers.

3.2 Material

This section presents the collected material by starting with explaining how consumers were recruited, then by describing the sample and finally by detailing the interview content.

3.2.1 Recruitment of consumers

Recruitment of consumers for this deliverable happened simultaneously as the recruitment for Deliverable 2.3. To reach different consumers, it was chosen to recruit them through social media and offering a gift card to all the consumers who participated in an interview. In each partner country, the recruitment strategy was adapted to local social media culture.

- In Norway, a Facebook post was published on TØI's page, sponsored for several days and shared in 14 different public Facebook groups used by inhabitants of Oslo city districts.
- In Belgium, a similar method was used, starting from a post on VUB Mobilise's Facebook page that was later shared in 18 different public groups in Brussels region. The advert also circulated among students of the VUB following courses on sustainability as well as among the personal networks of colleagues involved in the project.
- As Facebook is less commonly used in the Netherlands, TNO partners suggested other channels and published the post on different WhatsApp groups and personal networks as well as through a platform for retailers from Utrecht municipality. Colleagues from the University of Groningen (RUG) involved in GreenTurn project were also contacted and supported the circulation of the post through their LinkedIn account.

- In Italy, the recruitment also happened through Whatsapp groups and LinkedIn where TRT colleagues shared a recruitment advert, as well as through personal networks, and Instagram personal profiles.

The advertisement text included a link to a survey with more information about the project and the interviews as well as the possibility to provide their e-mail address or phone number for those agreeing to an interview.

Participants received ethics information on how personal data are managed in the project and they were asked to provide explicit consent to participate.

3.2.2 Sample description

This deliverable presents results from a qualitative study where we interviewed 21 consumers. The focus was on individuals living in urban areas, where last-mile logistics are more complex, and consumers have access to a wider range of delivery options. The aim, successfully achieved, was to capture a diversity in awareness regarding sustainability. Additionally, diversity in demographics was sought and achieved to a certain extent.

The focus was on diversifying the sample based on awareness levels, rather than sociodemographic because research suggests that the diversity of behaviours when shopping online and making sustainable choices is rather driven by other explanatory factors than age, income or education (Caspersen and Navrud 2021; Caspersen 2023). This understanding informed the decision to emphasize varying levels of awareness and engagement with sustainability in the sampling. In line with the personas developed in Deliverable 2.1, which are based on motivation and opportunity, participants with diverse pro-sustainability behaviours and levels of awareness were sought. This approach better reflects the factors driving sustainable online shopping choices, ensuring the insights gathered are meaningful for understanding the diversity of consumers' behaviours when choosing delivery and return options.

To achieve this diversity, data on awareness level and sociodemographic characteristics were collected by asking each participant to fill in the two forms presented in annexes B and C. Interviewed consumers are presented in annex D (their names have been changed for anonymisation purposes).

3.2.2.1 Description in terms of behaviours and awareness

To better understand consumers' awareness and behavioural change process, it was tried to interview consumers at different stages of change, based on the Prochaska's TTM. The aim was to interview a wide range of consumers, from online shoppers unaware of the impacts of deliveries and returns to aware consumers trying to choose the more sustainable delivery options.

Consumers were asked to indicate their level of agreement on a Likert scale with 10 statements assessing awareness and behaviour regarding sustainable delivery choice (Annex C). Figure 1 presents a summary of their answers and illustrates the diversity of interviewed consumers.

Based on consumers' answers to these statements, a simple "pro-sustainability indicator" was developed. Depending on their reply to each statement, a consumer got -1 (Strongly agree); -0.5 (Somewhat disagree); 0 (Neutral); 0.5 (Somewhat agree); 1 (Strongly agree) point, or the other way around². The indicator ranges from -4 to 6.5 (Annex D) illustrating the diversity of profiles in the sample.

This indicator is not only measuring consumers' awareness regarding deliveries and returns from e-commerce, as it also integrates statements on behaviours. For example, some consumers are unaware of deliveries' impacts but still have a pro-sustainability behaviour when they choose a delivery option because it is more convenient or cheaper and thus get some points accordingly in the calculation of the indicator. Therefore, the indicator is rather a more global measure of pro-sustainability behaviours and

² Some statements have a positive formulation, so when consumers answered "strongly agree", this means that they have a pro-sustainability behaviour. Other statements have an opposite formulation, so it is when consumers "strongly disagree" that they have a pro-sustainability behaviour. In that case, the scale is reversed.

awareness regarding e-commerce deliveries and returns. Since each consumer has its own understanding of each statement and answers accordingly, the indicator should not be used to compare consumers one by one. However, it enables to illustrate the diversity of consumers and to identify consumers with particularly low or high awareness levels.

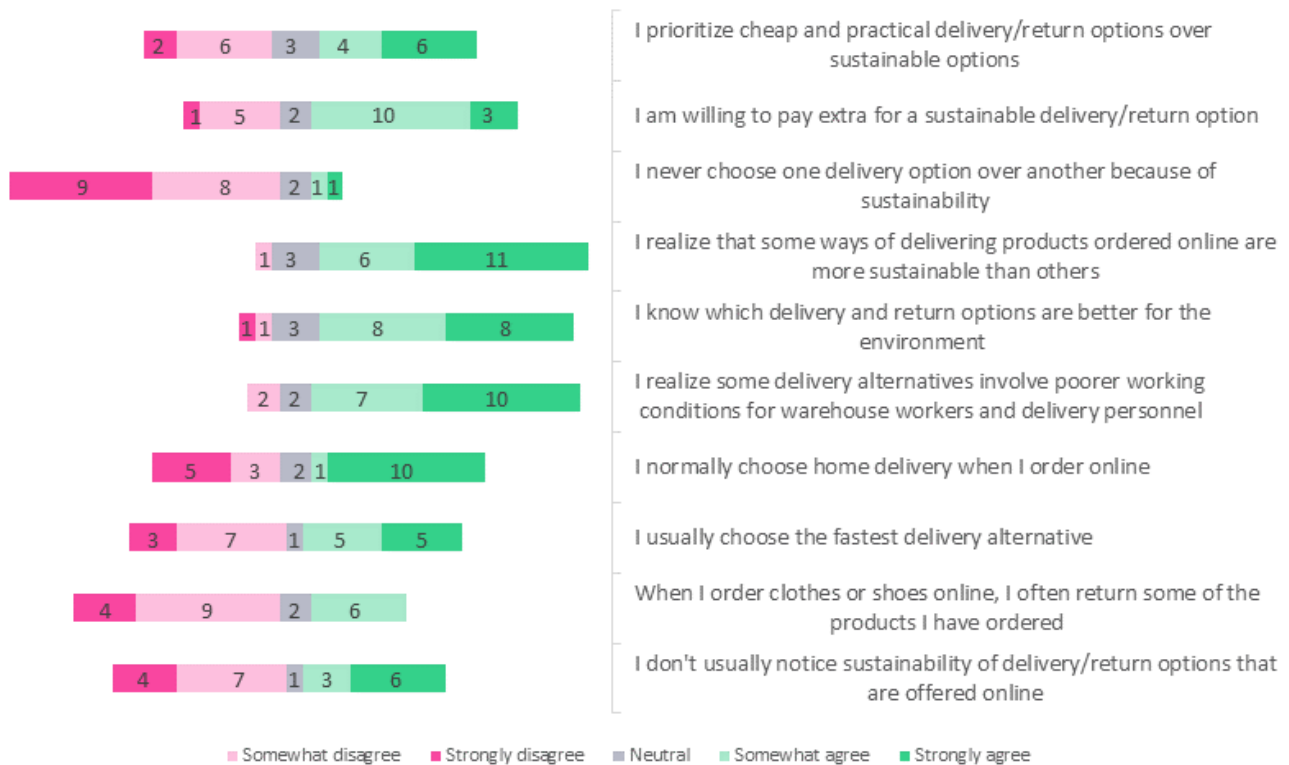


Figure 1: Participant distribution by agreement level on statements assessing pro-sustainability awareness and behaviour in delivery and return choices

It was not possible to place each consumer in a specific stage of the TTM as they can be aware of a specific issue and already adapted their behaviour accordingly (maintenance stage) and at the same time being unaware of another issue and still being in precontemplation stage on that topic. As this is one of the findings of the interviews, the results will provide more details (see 5.1.3).

3.2.2.2 Sociodemographic description

As outlined in the introduction of section 3.2.2, it was chosen to emphasize the diversity in terms of awareness and behaviours rather than regarding sociodemographic. Nevertheless, an effort was made to diversify consumers according to gender, age, household type, type of residential area, education level and country. While not exhaustive, the resulting diversity is described in more detail below.

Even though the sample is diverse, some sociodemographic categories are underrepresented or even absent. Respondents are distributed across age groups from 18 to 70 years old, with:

- 9 consumers between 18 and 30,
- 5 consumers between 31 and 40,
- 1 consumer between 41 and 50,
- 4 consumers between 51 and 60,
- 2 consumers between 61 and 70.

No online shopper over 70 was encountered.

The sample includes 16 women and 5 men. This gender-based difference in participation is often observed during recruitment via mail or internet (Becker 2022). The underrepresentation of men may be further explained by the fact that they shop online less frequently than women. For example, in Sweden, 22% of men shop online at least once a week, compared to 30% of women. The difference is less pronounced in Norway, with 21% for men versus 23% for women (Postnord 2024).

Regarding household structure, the sample is primarily composed of individuals living alone without children (10 out of 21 participants). Otherwise, 3 consumers in a couple without children, 2 in couples with children, and 6 in other types of households (specifically shared housing arrangements) were also interviewed. Single parents are absent from the sample. The overrepresentation of single individuals without children may be explained by the organizational requirements of the interviews, which asked participants to be available and willing to travel to meet us, necessitating a flexible schedule.

Geographically, the respondents mostly reside in city centres (16 out of 21 participants). This is because, for organizational reasons, the interviews were conducted in urban areas of Oslo, Brussels, Groningen, and Milan. This strong overrepresentation of urban consumers allows to explore their motivations and online shopping behaviours in greater detail, especially as they live in areas where last-mile logistics are the most complex.

In terms of educational attainment, 13 of the interviewed consumers hold a master's degree. This is particularly true for respondents from Belgium and the Netherlands, which can be attributed to the fact that recruitment via social media was less effective there than in Norway, leading us to rely on word-of-mouth recruitment to secure enough volunteers. Nevertheless, the sample remains diverse, including individuals with lower levels of education (four participants with a bachelor's degree, three with high school education, and one with other higher education).

While the small number of participants interviewed are in no way representative of European consumers, they are diverse in terms of their level of sustainability awareness, their delivery and return choices, and to some extent in terms of socio-demographic characteristics. This diversity allowed to explore and understand the diversity of online consumer behaviours.

3.2.3 Interview content

Interviews were mainly conducted face-to-face and online interviews were conducted as a replacement solution when participants or interviewer got sick. The interviews were conducted in different languages (Norwegian, English, French and Italian) and lasted between 60 and 120 minutes.

The interview guide was inspired by the biographical approach (Greene and Rau 2018; Greene and Royston 2022; Plessz et al. 2016), a method that is commonly used in the sociology of consumption, especially to study changes in consumption behaviour. The interview guide is presented in Annex A.

In CodeZERO, the biographical interviews aim to understand the process that could lead people to change their choice on delivery and return options. The interview guide included questions on knowledge about deliveries and returns associated to products bought online, as well as questions on how delivery choices had evolved, how they became interested in consequences of e-commerce and motivated to change their behaviour, how they incorporated changes into their routines, and what kind of adjustments they had to make. In the interviews, consumers' preferences and behaviours were explored in depth to gain a better understanding of how sustainability is taken into consideration when choosing a delivery method and what trade-offs are made. In addition, the semi-structured interview survey aimed to capture specific qualitative dimensions of online consumption and delivery choices, such as socialization processes related to sustainable consumption and descriptions of routines and online shopping organizations.

The interview guide was conceived as a flexible tool, following the recommendations of Kaufmann (2004) within the framework of the comprehensive interview. The most possibly open-ended questions were drafted to spark a conversation with consumers. The objective of this guide was to encourage interviewees to narrate their online shopping practices and delivery choices. The interviews' guide evolved as the research progressed by removing, adding, or reformulating questions (Kaufmann 2004).

3.2.4 Analysis

All the interviews were transcribed in full using an automated transcription tool ([Autotekst \(uio.no\)](https://autotekst.uio.no)).

The transcripts were analysed thematically. An initial analysis grid was constructed based on the literature as well as the notes and initial observations made during the interviews, with focus on the following themes:

- awareness on delivery and return impacts,
- awareness evolution over time,
- behavioural change processes,
- adaptation strategies,
- life stages and key events in online consumption.

Using an inductive approach, the grid was modified and improved after reading each transcript. Each interview was analysed using this grid. Verbatims were extracted from each transcript and classified in the grid under each theme or sub-theme they illustrated. In this way, it was possible to compare the tables to cross-reference and compare the different interviews.

4 Online consumers' awareness of delivery and return impacts

This section presents findings on online consumers' awareness with regards to delivery and return impacts. Addressing the questions 'What are consumers aware of?' 'How have they learnt about it?' enables to identify possible ways to increase consumers' awareness.

4.1 Different areas of awareness

When asking participants about what they know regarding deliveries, many of them have a partial knowledge of what happens to their products from the moment they order online to the moment they arrive to them. They generally are aware of a specific issue related to online shopping, but it is less often that they know about the differences of impact between delivery options. The issues consumers are aware of are presented in this section, highlighting the fact that the impact of the different delivery methods is a blind spot in consumers' awareness. It also draws attention on the fact that only few consumers have a general awareness on multiple issues, and most of them have a rather small awareness area.

4.1.1 Unsustainable working conditions

One of the things consumers are most aware of is when online retailers have ethics they considered as wrong, such as when they provide unsustainable working conditions. Even consumers with low awareness on environmental and sustainability issues are mentioning such issues with some companies.

An American worldwide e-commerce platform (AAA) is probably the company for which the most consumers have mentioned ethical problems, particularly when it comes to employee working conditions. This is what Christine describes, for example: she is aware of the way AAA employees are treated, that they are stressed to work very fast for a small income. But this knowledge is limited, as Christine has knowledge about AAA, but not about the other sites on which she orders.

« So in any case, on websites like AAA, it's exploitation. But I'm aware of that. I'm aware of that. [...] I know it's 200% exploitation, but it doesn't make sense. They're paid a pittance; they have to run like crazy. But I don't think all sites are like that. When you buy from a more decent site, I'm not saying that... well I hope not! »
Christine

Other companies are also named in our interviews. For example, Célia, a consumer with a greater awareness on sustainability issues compared to Christine, named several retailers that have questionable ethics and encourage consumers to buy a lot from them, with very low prices, behaviours with a bad environmental impact.

"AAA, BBB, CCC, DDD³ are all platforms, except CCC, but they're all platforms I've ordered from for economic reasons most of the time. Because the products are cheaper, at some point you have to make that clear. These are still companies that have a catastrophic ecological impact and encourage over-consumption. Finally, ethically speaking, in my personal ethics as a consumer, I find this completely deleterious."
Célia

Other companies are also named, not necessarily regarding their e-commerce strategies or their delivery and return process, but for example about working conditions for the manufacturers in the

³ BBB, CCC and DDD are Chinese worldwide e-commerce platforms.

country where products are made. Table 1 presents an overview of consumers who are aware of issues related to unsustainable working conditions.

Table 1: Overview of consumers' awareness related to working conditions

General area	Specific issue	Aware consumers
Working conditions	Working conditions of riders, drivers and warehouses' workers	Ingeborg, Julie, Nathalie Colette, Christine, Jacob, Sylvia, Francesca, Elena
	Working conditions of manufacturers	Maia, Julie, Emil

4.1.2 E-commerce is a threat for local businesses

Some consumers are also concerned by the fact that shopping online threatens small shops in their city, as Sylvia describes it. This issue is only mentioned by three consumers we interviewed.

"Because otherwise [local shops] die and then it ends up that we can only buy online. And buying online is a prison. That is, it is not freedom, because anyway the products they offer you, then you don't know the origin well, I don't know, that is, the human contact is missing, everything is missing, so it is important. [Shopping online] is comfortable, but it is important that there is not only that, that is, they have to coexist, yes ok, the online purchase, but ok, very well also the local enterprise, the small producer. Of course, online prices are competitive. This is a problem."

Sylvia

Table 2: Overview of consumers' awareness related to local businesses

General area	Specific issue	Aware consumers
Support local businesses	Buying online threatens the viability of local companies	Ingeborg, Colette, Sylvia

4.1.3 Returned products are rarely put back on sale

Many consumers are also aware that when a product purchased online is returned, it may be thrown away or burned instead of being put back on sale. Julie explains that she has made enquiries about this, and she understands the retailers' motivations behind this behaviour, showing that she has a great awareness on this issue.

"What I've heard is that anything you send back will never be put back on sale and that it ends up in a big dumpster and gets thrown away. Because it's going to take them too long to sort through all that stuff and put it back on sale. And so, you think to yourself, it's crazy to do this kind of action. I think it's crazy. And so, you tell yourself that you don't want to support these things."

Julie

Marianne is another example of a consumer aware of this problem. She has also heard of it but says she has doubts about the veracity of the information, indicating that she lacks knowledge on this issue to trust that it is true.

“I think I read it or heard it, I don’t remember, that a lot of clothes, especially from EEE⁴, that when you return it, it goes to the recycling bin or not, or to Africa or something, that it doesn’t get returned to the stores. But I’m not sure if it’s true.”
Marianne

Table 3: Overview of consumers’ awareness related to returns

General area	Specific issue	Aware consumers
Returns	Returned products are rarely put back on sale	Marianne, Julie, Célia, Jeroen, Jacob
	Environmental costs of returns transport	Colette, Tim, Laura

4.1.4 Excess packaging

Rarely do consumers think about packaging when we ask them about their definition of sustainable delivery. Nathalie, Mei and Ella are the only one from our sample to mention it, even though they are consumers with a relatively low awareness on sustainability issues in general and about online shopping in particular. Ella mentions that she is sometimes surprised by the amount of plastic and packaging she receives when she only orders a small item.

“Some companies use a lot of packaging. For example, if I’ve ordered a very small thing, for example, a face cream. And then it’s in one of those really big boxes with lots of plastic and things like that. And then I can think that ... What was the point of this, anyway? Why do you have to use so much packaging for such a small item? But otherwise, I’m not really that conscious.”
Ella

Table 4: Overview of consumers’ awareness related to returns

General area	Specific issue	Aware consumers
Packaging	Too much packaging	Ella, Nathalie, Mei

4.1.5 Transportation related issues

When asked about the impacts of e-commerce deliveries and returns, many consumers are thinking about long distance freight, rather than last mile deliveries. For example, Marianne mentions that if the site she orders from has storage in Norway, then delivery is more sustainable because it doesn’t require long distance transport by plane or truck. This response shows that for Marianne, talking about sustainable deliveries refers more to transport from the place of manufacture or storage, rather than to the last mile.

“I can’t say I’ve seen anything on the website, but it’s probably more environmentally friendly to order from shops that have storage in Norway. You don’t have to fly something in or drive far with a truck.”
Marianne

This is relatively common in the conducted interviews. It is also the case of Julie, for example. She has a great awareness of sustainability issues and tries to think on how she can make her behaviours more sustainable. When asked about what sustainable deliveries mean to her, she also thinks about long distance freight. She has more knowledge than Marianne, as well as a broader perspective, including

⁴ EEE is a worldwide clothes retailer.

also consolidation of deliveries, working conditions of the drivers and the responsibility of consumers. Even if broad, her answer does not include issues related to last mile deliveries.

“First of all, avoid flying if at all possible. That things are sent logistically, that it is done on a larger scale, rather than on a very individual scale. After that, if it’s possible, but as we said before, normally, unless you’re ordering something that’s made in the same city or whatever, it’s complicated for it to arrive, let’s say, in a non-motorized means of transport. If it can consume, let’s say, less gasoline, etc., it’s better. But generally speaking, that’s not really the case. So when it comes to logistics, it’s better to do things on a larger scale to minimize environmental impact. To be prepared in terms of the conditions of the employees who will be carrying out the transport. When you see all the truckers on the road, frankly, not long ago I made a night journey between France and Luxembourg. [...] You’ve got freeway service areas full, full, full of lines of trucks with guys sleeping in their trucks. I mean, you think... It’s... I mean, what is this life? And we put people through it. Why, really? So I can get my telephone case tomorrow instead of the day after tomorrow? Well, it’s a bit... Yeah, so I’m trying to think about that a bit. Yeah, I’d say in terms of carbon emissions and in terms of human well-being. Those are the two things that come to mind the most.”

Julie

Table 5: Overview of consumers’ awareness related to transportation issues

General area	Specific issue	Aware consumers
Transportation in general (incl. long distance)	Local or national storage avoids long distance shipping	Marianne, Julie, Nathalie, Emil, Laura
	Some transportation modes are more sustainable	Marianne, Julie, Nathalie, Colette, Tim, Jeroen, Jacob, Emil, Francesca, Laura
	Inefficient deliveries imply more CO ₂ emissions	Julie
	Buying second hand in Europe implies less transportation impact than buying new products manufactured in Asia	Colette
	Purchasing something implies transportation and thus is not sustainable so I am trying to buy less	Colette, Tim, Jeroen, Laura

As for Julie, interviews show that the impacts of last-mile deliveries are rarely known by consumers, even by consumers with a high awareness on environmental issues. That’s what the next paragraph is about.

4.1.6 Last-mile impacts: an awareness area limited to certain consumers

The interviews are showing that even if consumers are aware of certain issues related to online shopping, they are not often aware of the impacts of last-mile deliveries. Those who are aware of such issues are mostly consumers studying supply chain management or working in the sector. It is for example the case of Anna who studies supply chain management in Groningen. She is well aware of the different impacts of delivery options like fast delivery vs. normal delivery, or home delivery vs. pickup points. But it is rather rare in our sample where differences between delivery options in terms of impacts on society are rarely known.

“If it’s fast delivery, I think the truck maybe will be emptier, so it’s not full truckloads. And maybe if you have longer delivery, so maybe five working days, then I think it’s cheaper because the truck has time to come full and then there’s full truckload delivery. I’m not sure if that’s the reason behind why it’s cheaper, but I can imagine. And about the pickup location and about getting it to your house I think the pickup location also is better because then a truck can just go to the location and drop all those things and you don’t have to have smaller trucks going around the centre and dropping it at everyone’s house. So that’s also more convenient for them and also better for the environment, I believe.”

Anna

Table 6 shows that consumers who are aware of the impacts of last mile deliveries are either consumers who studied supply chain management (Anna, Tim, Niels and Jeroen) or urban and regional planning (Jacob) or consumers with a high general awareness on sustainability issues (Julie, Colette, Célia, Giulia, Sylvia and Laura). This indicates that knowledge about the impacts of last mile deliveries does not spread to the general population, unlike other issues such as working conditions or long-distance freight transport.

Table 6: Overview of consumers’ awareness on last mile sustainability

General area	Specific issue	Aware consumers
Last mile	Receiving several products at the same time is more sustainable	Colette, Sylvia, Laura, Niels
	Pickup points are more efficient and better for the environment than home delivery as they avoid trips	Célia, Jeroen, Anna, Giulia, Laura, Tim, Niels, Jacob
	Deliveries imply pollution in cities	Giulia, Sylvia, Niels
	Deliveries imply safety issues in cities	Jeroen, Giulia, Laura
	Fast deliveries imply lack of consolidation of shipment	Julie, Anna

4.1.7 Consumers’ partial awareness

The interviews reveal that consumers have awareness on different issues related to online shopping, but last mile impacts are a blind spot in consumers’ awareness, particularly for those with low pro-sustainability values.

What also emerges from the interviews is that, when consumers are aware of the challenges posed by online deliveries and returns, this awareness is partial and only concerns certain issues. Consumers are rarely aware of the bigger picture when it comes to e-commerce deliveries and returns. Annex E presents an overview of the participants’ awareness areas. Many consumers only have their name in front of only one or two issues (for example Christine, Mei, Elena, Maia, Ella). But even consumers with a general high awareness are not aware of all issues. If we look at Colette’s example, she is aware of many different issues and she is also engaged in different pro-sustainability behaviours, but she is unaware of the fact that home delivery is a less sustainable delivery option than pickup points. Our results therefore suggest that consumer knowledge is relatively patchy.

The next section presents the different channels through which consumers have become aware.

4.2 A diversity of channels to learn about deliveries

The interviews draw attention to the fact that consumers learn about deliveries through different channels.

Some consumers have limited awareness of the issues caused by deliveries and returns of products purchased online. For those consumers who are informed about the topic, their understanding may stem from a single primary source or have developed progressively under the influence of multiple sources of information.

Through a biographical approach, it was sought to reconstruct consumers' learning processes. However, sometimes consumers had difficulty recalling the origin of their knowledge about e-commerce deliveries and returns.

4.2.1 Knowledge and awareness come from diverse channels

4.2.1.1 News and documentaries

Many consumers mention getting information about e-commerce in the news, on TV programs, from documentaries, in newspapers or on social media. It is the most common source of information mentioned in the interviews. Documentaries about AAA are frequently mentioned by consumers who learned about working conditions in their warehouses.

When consumers were asked how and where they have learned about deliveries and returns, they are most of the time quite vague and rarely remember a specific source of information. For example, Julie mentions news, articles, but she does not have a precise memory of a particular documentary or newspaper article. The answers from the consumers we met are often like Julie's.

"I think it's what you hear in the news, reading articles, etc., in terms of what they do with the things you send back, with the employees they have."
Julie

Few consumers have more precise memories of how they have learned about issues linked to deliveries and returns. For example, Célia explains that when FFF⁵ drivers were on strike, she was looking for more information to understand the context and the issues. She read newspapers and went on a union website to read their publication on the strike.

"I'm totally the kind of person who goes looking for information. But I have the time and the tools to do it. [...] The press, generally speaking, it's via the press. Sometimes... But this is more via the press. In other words, they'll say something, because I know there was a union, the CSC, which had been very active on the deliverymen issue. Then I went to see what was available, what they published."
Célia

Unlike most of interviewed consumers, Célia remembers very well the sources of information she used. She also has a very active approach, where it's she who decides to dig into a question and seek out information. She also explains that she has an advantage in doing this because she has the time and the tools, because of her professional background. Indeed, Célia is a doctoral student in urban planning, working on consumption issues and knows how to look for information. The following section presents findings on how studies or work can contribute to acquire knowledge about deliveries and returns associated with online shopping.

4.2.1.2 Studies and work

Some consumers have become aware of issues related to deliveries and returns through their studies or their professional experiences. This is probably more present in this sample compared to general

⁵ FFF is an American food delivery platform.

population because of some recruitment biases, especially in some countries like the Netherlands, where consumers were recruited through personal and professional networks of CodeZERO local partners. In Groningen, several students in supply chain management who know the processes to get products delivered were interviewed. But their knowledge does not necessarily imply behaviour change as we will see in Chapter 5.

Apart from the students met in Groningen, other consumers have gained knowledge from their professional experience. Maia who has worked in a pet store with online sales, knows how packages are prepared and collected by transporters. But despite her knowledge about logistics process, she is not aware of the negative impacts of deliveries on society. Other than the choice of transport operator (she prefers GGG over HHH⁶), it has not affected her delivery and return choices. This highlights the fact that even when people learn and know about the logistics processes behind online shopping, they do not necessary become aware of the problems they cause.

“Yeah, I actually worked in a pet shop who sent out orders from online. So, I know the process like pick it up, put it in a box, close it, put on the GGG sticker, put it in the cage, they pick it up, and then all the system, like where the package is going, the sorting at Lørenskog, and then out to those cars who are delivering to stores. So, I know all of that process. [...]”

Interviewer: And do you think it influences in some way your choices when you choose a delivery option rather than another?

Maia: Well, I don’t know, to be honest, because I know GGG, but I also know HHH, because we had both of them coming. I don’t know, since I’ve been working with them and I always liked GGG much better, I think it’s like I choose those.”

Maia

Célia, a PhD student, does not work on logistics, therefore she does not learn about deliveries in her job, strictly speaking. But via her job, she has learned methods on how to find information on different issues. She also has other resources, such as colleagues working on urban logistics, whom she can ask. There is a form of socialisation by her work to the research of information on different sustainability related issues.

“And if I really have a question that I want to look up in the text, I can look up a legal text too. But then, my background is in political science, so I’m used to looking up legal texts. So, it’s not difficult for me to find a legal text. I think it’s unusual. It’s not easy to find the text of a law. [...] I also have colleagues who work on these issues, so sometimes I’ll ask my colleagues.”

Célia

4.2.1.3 Social network

Consumers’ social network (family, friends, colleagues) can also play a role in raising awareness on some issues. Sylvia for example, is mentioning that her husband is informing her about the consequences of her online purchases on local shops and is encouraging her to support them.

“My husband also always tells me to prefer [local shops], even if things cost more because he doesn’t want to make them die.”

Sylvia

Awareness raising can also be the result of a long socialisation process where social networks are involved. For example, Tim explains that his parents have raised him with the idea to behave in a way

⁶ GGG and HHH are Norwegian transport operators.

that limits environmental impact. This has infused in his mind, making him aware of sustainability issues in general, as well as in his behaviours.

“I think my family is pretty environmentally conscious. So I think they learn me or explain me to avoid unnecessary delivery basically. [...] Well, they told me to only order when you know that you need it or want it, basically. They're not a big fan of just ordering many, many items and seeing which one you prefer and then sending everything back. It's not something they like. Also, only do home delivery when it's needed, basically, due to the environmental impact of home delivery. [...] They are pretty interested in these things and like to avoid the necessary environmental impact. So this is something I'm raised with, I think.”

Tim

4.2.1.4 Real-life experience with deliveries and their consequences

Consumers can also know about the consequences of deliveries by noticing by themselves the consequences of deliveries and returns in cities, observing vans operating and delivering individuals in the streets. That is what Giulia explains below. She notices all the vans from different companies, and she makes the correlation between these vans and Milan's poor air quality, as well as the safety problems this poses, especially for those who travel by bike, as she does.

“You go around the city and you see a lot of cars of III, JJJ⁷ or... or the KKK⁸, they're doing their deliveries. So just looking at the reality around me. Now, if you see the air in these days here in Milan, it's really, really tough. it's not raining and there's a fog always and it's not so good to breathe this. [...] Also because I usually move by bike around Milano and you know it's always more and more, it's getting more and more difficult and so dangerous also because you know you always have to have five eyes everywhere to see all around you. So it's a problem of traffic and pollution, both of them.”

Giulia

To be able to notice the vans and to think about the relations between online shopping and what happens in the streets, requires having a general awareness about sustainability issues as well as cognitive abilities allowing to make such correlations. Performed interviews show that many consumers do not have this understanding. Out of all interviewees, Giulia was the only consumer talking about congestion, traffic safety and pollution as means of raising awareness.

4.2.1.5 Environmental awareness and own reasoning

Some consumers also explain that what they know about deliveries and their impacts comes from their own logic, that it just makes sense to them. This is the case, for example, of Julie, who avoids express deliveries to enable logistics operators to distribute parcels more efficiently by consolidating deliveries. She explains that this seems logical to her, that she doesn't remember learning this from any other source, and that it was her own reasoning that led her to this conclusion.

“When I buy, I don't need to have the item the next day. So I often go for the cheapest, even if it takes a little longer. [...] So I'll wait a week or two, because I don't think it's urgent. And also, in terms of, again... ecology, ethics, etc., I don't need a driver to bring me my object tomorrow, I can wait a little while and have it done a little more in a process where the person can bring several things to the same place at the same time. I think that's a bit more logical too. [...] I'd say it's just logic. [laughs] No, I don't know how I came across it, honestly.”

Julie

⁷ III and JJJ are worldwide transport operators.

⁸ KKK is an Italian online grocery retailer.

Other consumers also explain how they came to understand the impact of deliveries through their own reasoning, like Giulia for example. When she noticed the number of daily deliveries to her apartment building, she quickly realized by herself the impact this could have on the city as a whole.

“I noticed even here in my house we are a lot of people that live in this house and there’s always some deliverymen that comes and leaves a package. [...] I started noticing this, and if only here I see maybe four or five deliveries a day, you know, all around the city, what could be a lot of movement, people driving around. So, yes, I think when I noticed that there was a lot of people that were using this kind of delivery, it’s a big number. So it’s an impression to see, to imagine how many trucks, how many vans are around the city doing these things.”

Giulia

Consumers who understand the impact of deliveries on society through their own reasoning are consumers who have also developed a general awareness on environmental issues and have already thought about how their own behaviour impacts society. Julie and Giulia are two good examples. Their awareness indicators are 6 and 6.5 respectively. Each in their own way, they are thinking about how they can limit their environmental impact by questioning all their practices, and it is in this context that they have developed a line of reasoning on the consequences of delivering parcels bought on the Internet.

4.2.1.6 The example of Anna’s awareness, the result of multiple sources of knowledge

Anna is a student in Groningen (the Netherlands). During her interview, she explained how she had become aware of the sustainability issues associated with online shopping and delivery over the years, and how different factors had contributed to raising her awareness. When she started her studies, she was completely unaware of these issues and bought a lot of clothes online from different retailers. She gradually became more aware of sustainability issues, particularly in relation to online purchases and deliveries via:

- her boyfriend, who reads a lot about these issues and talked to her about them,
- the reading she did following discussions with her boyfriend,
- TV reports by Arjen Lubach,
- her studies in supply chain management.

“I think in my time as a student, but not in my... I’m now a fifth-year student, so I think maybe around my third or fourth year that I became more aware of sustainability and all those packages that come to you and then they have to get returned and maybe they’re even burned or something. [...] And also a friend of mine is really aware and he told me more about it and I also now see that it’s not often very necessary to buy a lot of stuff you don’t wear. So I try to be more critical of what I need and what I don’t need. And I think you also have a program Zondag met Lubach or Arjen Lubach or something. He also makes really good videos about online shopping. [...] I think also his videos help me to really understand the impact.”

Anna

“Well first, I had no idea. And I also didn’t mind, to be honest. But now in my studies, because I study supply chain management of course you know a lot more about the process and also about last mile delivery that’s really expensive and also sometimes very difficult.”

Anna

“I think [I got interested in the environment] through my friends, boyfriend actually. [...] So I think it’s just my curiosity and he’s just telling what he read or something. And then I will read about it on my own and then I become more aware everything around me.”

Anna

Anna's example illustrates the complexity of consumer learning and awareness processes about the impact of deliveries. The biographical approach allows us to shed light on the different stages Anna has gone through to reach this level of awareness. In the performed interviews, no consumers who had a sudden awareness following a particular identified event were identified. Most journeys are gradual and generally part of a more global reflection on sustainability and how to consume in a more sustainable way.

4.2.2 Public authorities, organisations, and retailers: the big missing figures

Few have learned what they know about deliveries and their impact from retail websites or public organizations. That's what this section shows.

4.2.2.1 Information rarely comes from the retailers' websites

Performed interviews draw attention on the fact that consumers are rarely informed on the impacts of deliveries and returns on the retailers' websites. The differences between different options in terms of impacts are rarely explicated there. Only two exceptions emerged. When Célia orders from an online pet shop, she refers that the website provides information explaining that accepting a postponed delivery date enables to reduce the environmental impact.

"For example, the thing I do most regularly is buy food online for my cats. It doesn't matter if it arrives later. They say "check this box if, for ecological reasons, you don't mind if it comes later". I agree, I don't mind. That's it, I've got the time, it's not a problem."

Célia

When Maia orders groceries online, she has noticed a green label materialized by a green leaf. On the retailer's websites, explanations are provided on the implications of choosing labelled deliveries: the same time slot is already chosen by a neighbour which means they can deliver several consumers at the same time and drive more-effectively.

"Since I'm not in work or something, I actually just go for the cheapest one. Because they have, if some of your neighbours have ordered in the same time zone, you know, you get it cheaper. You can also get it for free if it's in the same building. So it's always like the cheapest one, but it's also convenient for the nature because they don't have to drive around so much. That's what they actually say when you're choosing, "choose the more eco-friendly". So it's like this little leaf on."

Maia

Apart from these two examples, consumers do not mention having learned about delivery impacts on retailers' online shops. Deliverable 2.3 will provide more knowledge about consumers' understanding of delivery and return options, based on what they see on retailers' websites.

4.2.2.2 Delivery vehicles as billboards

Another way for retailers to inform about their delivery options, is to use delivery vehicles as billboards. Colette gives the example of the cargo bikes used by Coolblue in Belgium. As their colours are noticeable, she considers it is easy to recognize them and identify them as the company providing deliveries by bikes. But once again, this is only mentioned by one consumer, indicating that retailers probably do not often use this communication way.

"[Coolblue, they] do advertise. I don't know if it's on their shops' window or if there are ads on TV or Youtube, I don't know. And you can actually see them getting around Brussels a lot with their stuff [their cargo bikes and electric vans], so since the colours are horrible, you can see them straight away. [...] I think it's also a marketing strategy. It's ugly, but in any case, we see them, and we don't forget them."

Colette

4.2.2.3 Lack of trust in retailers' information

The interviews also show a lack of trust from consumers towards e-retailers and the information they provide on deliveries. Colette explains below that she is sceptical regarding what retailers are labelling as sustainable because she considers they are only doing it for commercial reasons, to generate more profit. She does not trust that deliveries are actually sustainable but believes it might be greenwashing.

"But already when it comes to big multinationals and all that, I say to myself that as soon as there are shareholders behind them, already the economic models in which we buy are going to have an impact on the decisions made. So, when it's big companies based on the stock market with shareholders and all that, in fact, no matter what they say, they're always going to prioritize profit over ecology. So, as a result, they're going to take action, because today, that's what people want to hear. Consumers want sustainability. So they're going to do all that. They're going to surf on that. [...] I often say to myself, is this just greenwashing to please people? Are we going to put in a few thousand or tens or hundreds of thousands, depending on the company, just to please consumers a little? Or does the person behind the project really believe in and want to change our system of consumption."

Colette

Several consumers seem aware about the risks of green washing and do not trust retailers at first. They are looking for detailed information about the products they are buying to be able to assess whether they can trust the retailer or not. For example, Julie bought slippers from a small brand and carefully read the website, looking for information about how the money is used, whether people making the slippers are receiving a fair wage, whether raw materials are properly sourced. She explained the same checking process for several purchases: she looks for pages on the websites where the ethics of the brand or the retailer is detailed and based on that she can evaluate if she can trust the brand or retailer. In the interviews, none of the consumers mentioned a similar process for finding information on deliveries.

"You're always thinking about whether it's green washing or not. But it's very complicated to see that completely. Because it's still something you buy on the Internet. [...] I look at it in detail. I try to see if it's not just their Instagram ad that puts two, three things. I'll check out their website. I don't know, there's always a part where you say, I don't know, who are we and so on. I look at it a bit because, [...] it's nice to know a little bit about the story behind [a product such as the slippers I bought]. Okay, I know part of the money goes to that, another part goes to Peru, how they source their alpaca wool and so on. But they can tell you whatever they want. Maybe they tell me what I want to hear. But then, I wouldn't know. But I like to look a little more closely at where things come from and try to see a little."

Julie

The lack of trust towards retailers and the lack of information is also highlighted in the interview with Marianne, who considers that e-retailers she orders from are big company with enough money to cover the delivery costs, so she is not willing to pay more than 69 NOK (5.9 €) for delivery fees. However, certain retailers offer to tick a box at the check-out to support charitable organizations with a 99 NOK (8.4 €) donation and she usually does it, as she explains below. That shows that when they trust that their money is used for a good cause, consumers are willing to pay more. Maybe Marianne would be willing to pay more for the delivery fees if it was explained to her how it benefits to society. Retailers and transport operators should find ways to improve their communication towards consumers and explains what the delivery fees are used for.

"Because on some websites you can pay to plant a tree or pay a fee for the environment. I usually do that on the sites where it's available. [...] I feel like I'm part of the doing something for the environment. And it's just an extra click and some extra money, but then I kind of did my part. [...] Kind of doing my good deed"

for the day. Often the places that we order from are big companies. They have a lot of money. So, if I have to pay for something good in the world, I would rather do that than paying the delivery fee. It's not like I'm going after and just ordering from places that do that. But if they do, I will usually buy it."

Marianne

4.3 What is it about sustainability that matters to consumers?

If we look at the responses to the Likert item "I know that some delivery methods are more sustainable than others" (Figure 1), many consumers are agreeing, which does not reflect consumers' level of knowledge noticed during the interviews. This discrepancy shows that sustainability refers to different things for people and consumers have different systems of values about what matters to them and how much they care about certain issues, something that is discussed more in details below.

4.3.1 The example of Christine "I don't care about green"

The example of Christine is particularly interesting to understand the diversity of personal values when it comes to sustainable deliveries. Christine's pro-sustainability indicator is the lowest of the sample with -4. During the interview, she explains that sustainability does not matter to her:

"I don't care about green, actually. No, it's not beautiful, but I don't care. No, but I'm honest. I'm telling you, I don't care. Completely."

Christine

She even seems to be irritated by sustainable delivery options, such as the one performed by cargo-bikes, considering that it is a trend, and hammered it home that what matters for her is that it arrives to her, as quickly as possible.

"The fact that it's respectful, that they come by bike, I don't care. Because now it's very fashionable. Honestly, I don't care. They come as they like."

Christine

But on the other hand, she cares a lot about working conditions of drivers and warehouse workers. As she explains below, she is horrified by the stress and pressure endured by workers from the logistics sector, which shows that even if she claims she does not care about sustainability, the social aspects matter to her.

"It's a bit exploitative, I know. It's a bit exploitative. But I know, I've already seen documentaries where they have very little time to prepare orders because, as customers, we're always in a hurry. So here, I'm sure we're taking advantage of it. So in any case, in AAA's style warehouses, it's exploitation. But I'm aware of it. I'm aware of that. [...] I know it's 200% exploitation, but it doesn't make sense. They're paid a pittance, they have to run like crazy. But I don't think all sites are like that. [...] In fact, I think that when it's cheap, people are exploited. It's horrible. What I'm saying is horrible. It shouldn't happen. But I'm aware of it. [...] You saw, they're running around like crazy. That's it, these huge warehouses. What's the point? To keep the customer happy. But this is horrible. I find it unacceptable. They're paid nothing. And that's not normal. I mean, it's human exploitation, almost."

Christine

This highlights the fact that only promoting "green" delivery options may not have an impact on everyone. It could even have a deterrent effect on some consumers like Christine. Sustainability is often understood as something better for the environment rather than for the society as a whole. Some consumers do not feel concerned and are not interested by what is labelled by retailers as "sustainable" (eg. sustainable delivery options), because for them it only refers to environmental sustainability, while they are more interested in the social aspects of sustainability. The green leaf, often used as a label for the most sustainable delivery option, may strengthen this partial understanding of sustainability. This result suggests that to appeal to all consumers, the promotion of sustainable deliveries by retailers

should be reconsidered. Promoting delivery options that offer better working environments could be one way to convince more consumers to choose sustainable options.

4.3.2 The example of Colette: the importance of local shops in cities

Colette is a consumer with a global outlook on society and how human activities affect the planet as a whole. In the interview, she expands on this reflection and mentions that true sustainability is achieved through sobriety and reduced consumption. This is reflected in her knowledge and online shopping behaviour, as she tries to buy as little as possible, second-hand when possible, and when she does buy, she tries to think about the best way to make her purchase. In her reflection on a more sustainable society, she not only considers environmental aspects, but also includes supporting local shops, who she believes play an important role in making the city a pleasant place to live. As she explains below, it's also part of her vision of a more sustainable society,

“On the one hand, it’s deliveries, but it’s also all the local shops that can’t compete with a machine like AAA. It’s also the death of our neighbourhoods. It’s great to be able to walk around, to have small shops. For example, when it comes to books, there are certain things where I’ll always try to favour the local retailer, because I find that from an ideological and symbolic point of view, it’s much nicer to buy a book in a bookshop than on AAA, if I can find it in both places. But sometimes, if I go to a bookshop and there isn’t one, then I’ll turn to AAA as a last resort for this type of product. So it depends on the product and I try to favour a more sustainable policy if possible, if it exists anyway.”

Colette

Consumers are aware of different topics and issues related to deliveries and returns but they rarely know about the impacts between different delivery options like home delivery vs. pickup points. More generally, consumers are often aware of some issues but rarely of the big picture.

The process to become aware is long and awareness is built over time, possibly through different channels. But retailers, as well as public organizations and authorities do not play an important role in informing consumers, which leaves them plenty of room for improvement in raising consumers’ awareness about e-commerce impacts. When it comes to how this information affect consumers’ behaviour, the effect is not automatic and depends on other factors explored in the next part.

5 Behavioural change processes

This chapter presents findings regarding how online consumers change their preferences in terms of delivery and return choices. Through a biographical approach, it was sought to reconstruct consumers' changing process for choosing delivery options. However, sometimes consumers had difficulty recalling the different stages they went through, which seems to indicate that the choice of delivery method is not a significant or structuring element in the daily lives of online consumers.

5.1 Is awareness enough to trigger more sustainable delivery choices?

This section provides findings contributing to a better understanding of the circumstances when awareness can trigger behavioural change for consumers adapting their delivery choices to more sustainable options.

5.1.1 Awareness does not always trigger change

The interviews reveal several consumers with awareness of the negative consequences of deliveries and returns and who nonetheless did not change their behaviour to choose more sustainable options. It is for example the case of Jeroen. He explains that he knows that home deliveries are less sustainable than pick-up points. His colleague reminded him about the day before our interview, but he already knew. But he also explains that even if he is aware of the issue, it is difficult for him to change behaviour because it is a lot more convenient for him to receive parcels at home, instead of cycling to the pickup point, especially for the same price.

"Always [delivered] at home. My colleague told me yesterday that's not good, or not the most sustainable option. [...] Yeah, but it's always easier. I prefer to just have it at my home and just know when it's there. [...] Every time someone has to drive from like a pickup point to your house, of course, it's extra kilometres. They don't do it with a... Oh, they do it sometimes with a bicycle, so then it's like CO₂ neutral. But if they do it with a car or with a pickup truck, of course, it's all the extra kilometres they need to make more CO₂ emissions. So it would be more sustainable to put it at a pickup point and cycle there all the time. I don't do that. I was thinking of doing it maybe later, like with the next purchase. Let's say if I had to pay two euros extra, to get it delivered at my house, I would not do it. I would just place it at a pick-up point and cycle there. But because it's free, and the other one is also free, it's quite a no-brainer for me to have it at your house instead of going somewhere to pick it up. [...] I already knew that, of course, but [my colleague] reminded me again."

Jeroen

In terms of stages of change, Jeroen seems to be in contemplation: he is aware of the issue and seems to think he needs to consider the possibility to change behaviour. He wants to try to think about it next time he will buy something online. Nonetheless he has not yet decided precisely that he will choose pickup points.

"I'm more aware of it and I'm reflecting on it as well. But I'm saying like, okay, next time I'm going to buy it, do I send it back to my home address or just to the delivery point, you know, because it's not that far away. So yeah, I'm definitely thinking of it, but there's a difference between thinking of it and really making a different decision. I'm somewhere in the middle now and I hope that I'm going to be there at one point. But they make it so easy for you, you know. If they only ask me like two extra euros every time to bring it to my house, to my door instead of a pickup point, I would definitely always do the pickup point."

Jeroen

Jeroen explains that the retailers don't support choice of sustainable delivery option and rather encourage unsustainable behaviours by offering free deliveries and returns. Indeed, retailers are choosing to offer these services for free as incentives to encourage consumers to buy more. But Jeroen

explains that if a small fee (2 €) was required for home delivery, it could be enough for him to change behaviour and choose the pickup point. This indicates that small price incentives could be an efficient way to trigger behaviour change for consumers already in the contemplation stage.

When talking about the fact that they don't adapt their behaviours to what they know is the most sustainable delivery option, some consumers feel ashamed or guilty. Of course, the guilt only concerns consumers who are aware of the issue. More findings about the guilt feeling are developed in D2.3⁹.

Therefore, in spite of awareness on last mile issues, it is interesting to note that some consumers stay in the contemplation stage and do not initiate a process of changing behaviour. Nonetheless, as they are in the contemplation stage, choosing more sustainable delivery options could be triggered by small incentives. Reducing the convenience of home delivery or increasing the fees would probably be a sufficient trigger for Jeroen. He fits well into "the uncommitted consumer" persona.

5.1.2 Awareness can trigger change in consumers with pro-sustainability values

5.1.2.1 Consumers values

Forthcoming D2.1 will show that consumers' values or motivations can determine if and how they will behave and engage in pro-environmental behaviours. It will distinguish between intrinsic and extrinsic motivations. Intrinsic motivation occurs when people adopt a behaviour because they value it, for example because they attach importance to sustainability. Extrinsic motivation, on the other hand, occurs when people do something to achieve a specific result or obtain a reward.

When talking about consumers with "pro-sustainability values", we refer to consumers with intrinsic motivation to adopt behaviours because they attach importance to sustainability.

It is for example the case of Julie, whose behaviours are detailed below.

5.1.2.2 The example of Julie

In other cases, awareness can trigger behaviour change. It is for example the case of Julie with her use of AAA. As mentioned earlier, AAA is a company that has been the focus of many articles and documentaries, especially about the working conditions of its employees. Even though this is not directly about change in delivery choice behaviour, it illustrates the potential of increasing awareness for triggering changes in online shopping behaviours. Julie was using AAA normally in the past and has heard and read about the company's working environment as well as the way they manage returned products. As Julie explains, it is not just one article or documentary that has triggered her behaviour, but it is an accumulation that has made her more and more aware of this issue. And since she has pro-sustainability values, she has started to engage in a behavioural change process to align her choices with her values.

Table 7 represents Julie's behavioural change process:

- She was using AAA as a first intention in the past
- She became more aware of sustainability issues related to AAA
- She started to avoid AAA.
- To do that, she has put in place strategies to adapt her behaviour. She does not use AAA in first intention when she looks for something, she favours specialized and local (Belgian) retailers, and she also asks her social network for recommendations.
- Julie also explains that even if she does her best to avoid AAA, there are certain circumstances where she needs to make compromises and use AAA because other solutions are more difficult or a lot more expensive. She gives the example of an earring clasp. She went to a jewellery, but it was expensive there. She was also willing to find it online on a jewellery website, but she did

⁹ Under preparation. To be delivered in February 2025.

not know any. On AAA, she had plenty of choice at prices she was willing to pay. So it was both easier and cheaper.

Even if Julie sometimes makes compromises with her new behaviour, it cannot be considered as a relapse to an earlier stage of change, because it is only in special circumstances that she orders from AAA. Otherwise, she is working to sustain the change and prevent a total relapse so she can be considered in the maintenance stage. In terms of persona, Julie fits well as a pro-sustainable consumer.

Behavioural change has been triggered by awareness in the case of Julie. But we would like to draw attention on the fact that in the interview Julie has shown pro-sustainability values and behaviours in other sectors than online shopping, indicating that she thinks a lot about her sustainability in her daily routines and how she can make more sustainable choices. So awareness can be a sufficient trigger to new behaviours for consumers who care about sustainability issues and are willing to make adaptations. The fact that she sometimes makes compromises shows that even for her who cares, adapting her behaviour is demanding. This provides a better understanding of the reasons why it is more difficult for consumers who care less about sustainability issues to adapt their behaviour.

Table 7: Julie's behavioural change process

Old behaviour	Trigger	New behaviour	Adaptation strategies	Compromises
"Even a few years ago, I was more likely to redirect myself to AAA, because it was the biggest platform, it was simpler, and so on."	"I think it's what you hear in the news, reading articles, etc., in terms of what they do with the things you send back, with the employees they have.... In any case, AAA is involved in a lot of scandals, and if you read a bit about them, you try to detach yourself a little from all the... But then, AAA is one example, but there are plenty of other examples in general, of brands, etc., where you try a little harder to detach yourself from them or consume less, to try and say, well, you're going to... try and stop funding these big structures, which do anything ethically, the word is wide, but... "	"And now, I'm trying a little harder to avoid these big retailers. As I was saying before, I'd rather go to the specialized ones for the ethical aspect and also, now, I find, in terms of quality." "Me, in general, I try to avoid the big retailers, so typically AAA, etc.. Afterwards, from time to time, you don't have a choice because when you type in Google to buy this, it will quickly link you to these big retailers who sell lots of different things. So when I want to buy something, it's more like, yeah, I've heard of it or whatever, and so I'll go to the specific site that sells the thing I need. "	"So instead of using AAA's search engine directly, you might go to Google to look for things, or say you need such and such, think about it beforehand, and find out which specialized sites are out there. So I work quite a lot with word-of-mouth. You say to yourself, okay, I need this, you talk to the people around you, you say, "do you know a good site that sells...let's take lighting, quality lighting? Ideally, if they're based in Belgium, that's even better. Yeah, to maybe make local brands work a little bit more."	"And I still use them from time to time, as I said before, because sometimes, indirectly, it's not that you don't have a choice, you always have a choice. But after a while, it's also the constraint you put on yourself not to want to use those platforms anymore. So I say to myself, too bad." "But recently, I went through AAA because I wanted to buy just one very specific earring clasp. At a jeweller's I was asked to pay a fortune. I didn't know which jewelry site to go to because it was a...It was a random piece of jewelry that I didn't know the brand of, etc. I went to AAA, I bought it on AAA, I bought it on AAA. I went to AAA, typed in this clasp and it offered me lots of different clasps."

5.1.3 Consumers can be at different stages of change depending on the issue

As we've shown in 4.1.7, consumer's awareness is usually partial, only on specific issues. For consumers willing to adapt their behaviour to what they are aware of, it is only possible for them to change behaviour according to what they know. As a result, consumers are at different stages of change depending on the issues (cf. Figure 2). For example, in the case of Julie, she is aware of issues related to AAA and she has changed behaviour accordingly. We've shown that she is at the maintenance stage of change for avoiding buying from AAA.

On the other hand, she does not know the differences in terms of environmental impact between home delivery and pickup points, so she is at the precontemplation unaware stage for choosing pickup points instead for home delivery: she has no awareness on this issue and usually chooses home delivery. Even more committed consumers such as Julie are not aware of certain issues and thus cannot initiate any changing process in their behaviours. This finding draw attention to the fact that there is a lack of information on the different delivery options and their impact.

In addition, when looking at Julie's food consumption, she initiated a behavioural change during the pandemic and started to buy food from local producers to support their activity. But she explains that since things are back to a normal situation, it was not convenient and too expensive for her to maintain this change, so she went through a relapse, back to precontemplation change.

The case of Julie, as several others, show that providing more information and giving incentives to some consumers, already in action or maintenance stages for other issues, has the potential to make them change behaviour on more issues.

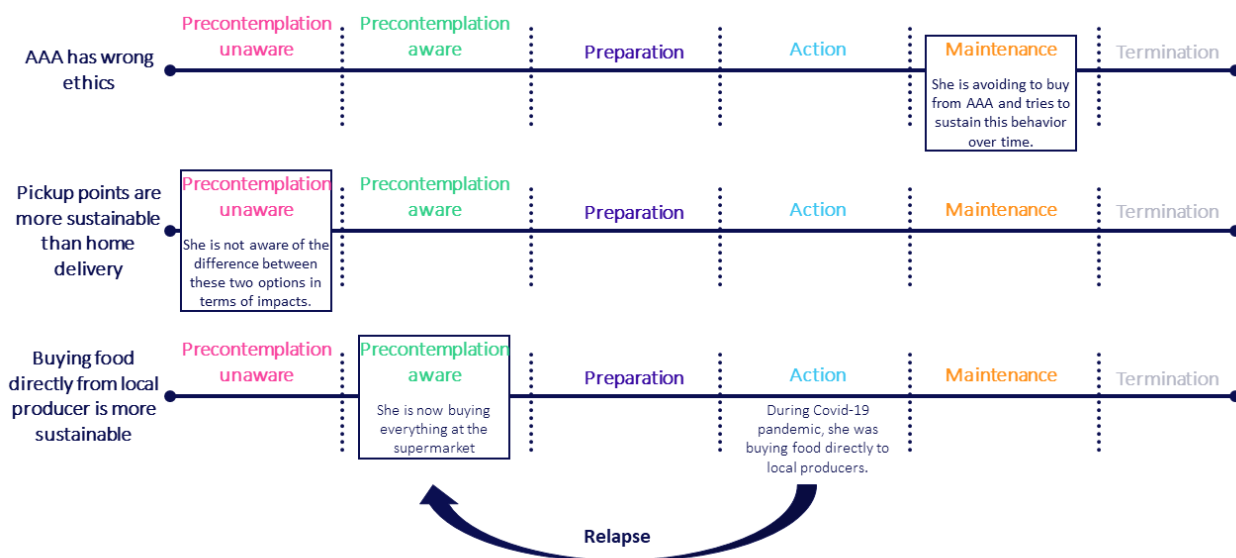


Figure 2: Julie's different stages of change

5.2 Other factors can trigger more sustainable delivery choices

In addition to awareness, other factors can help to bring about a change in consumer behaviour and more sustainable delivery choices.

5.2.1 Life events can trigger changes in delivery choices: the example of Elena

As for other consumption behaviour changes, new choices of delivery options can also be triggered by life events happening in a consumer's life. The example of Elena perfectly illustrates this finding as she

has changed behaviour several times in her lifespan following two different life events: a breakup and a change of job.

When it comes to Elena's awareness, it is focused on working conditions, especially for riders, rather than environmental issues. She knows well So.De in Milan and thus she is aware that companies delivering by bikes can provide very different working environments, depending on the riders' status (employed by the company of self-employed). Apart from this specific issue, Elena is not aware of the different impacts of delivery options.

Elena's example illustrates how stages in a person's life and how this has affected:

- the way she shops online
- her choices of delivery methods

Elena told us that she was in a relationship with her boyfriend. At that time, she did not buy anything online by herself but frequently asked her boyfriend to do it for her. He chose deliveries in pick-up points, so she was indirectly using this delivery method. Then they split up and Elena had to learn how to buy online for herself. She was encouraged by her job, which offered her benefits in the form of coupons to use on online retailers. Her colleagues and friends also influenced her in this approach as they were used to shop online. Like her colleagues, she chose to be delivered to her workplace. Then she changed job and now works fully from home. She still buys a lot online, but she now has her products delivered to her home or to her parents' home. She explains that her building does not have a caretaker so when she is not sure she will be home, it is easier to be delivered at her parents' as they have a caretaker in their building.

"Because my ex-boyfriend has Amazon or all the things like this. And I was used to asking, can you buy it for me? Can you buy it for me? Then we split up. So I had to start it by myself. So I had to do an account."

"My ex-boyfriend used a pickup point. So we were used to, but it was close to our house, so it was easy, but I don't remember if it costs something."

"[Before my previous work, I did not shop online] by myself, [but like through] my ex-boyfriend, like, can you buy it to me? Can you buy it to me? Can you buy it to me? And he did. So it was easy. [...] That's why otherwise I didn't, I wasn't used to use online."

"At the beginning, I wasn't a heavy user. But since two years ago, I can consider myself a heavy user of buying online in shopping field. [...] But it started for me more when in my previous work they give us a welfare. The welfare was also made by coupons that you can download from the website [and use them to buy online]."

"And in my previous work I used to put the address of the office that was really useful for all of me, all of my colleagues also. And now I'm doing home working, so it's easier to be at home and receiving the delivery here."

"Because my previous work was, I was used to go every day there, so it was kind of my second house, and so it's like all my other colleagues received there the things, so it was like we were all...they're like one take the parcel for the other and start to distribute and so it was like this, it was nice."

"[I do not choose deliveries in pickup points] because I haven't considered it. Because I'm working at home all the time. I'm fully remote now, so I don't think about it."

Elena

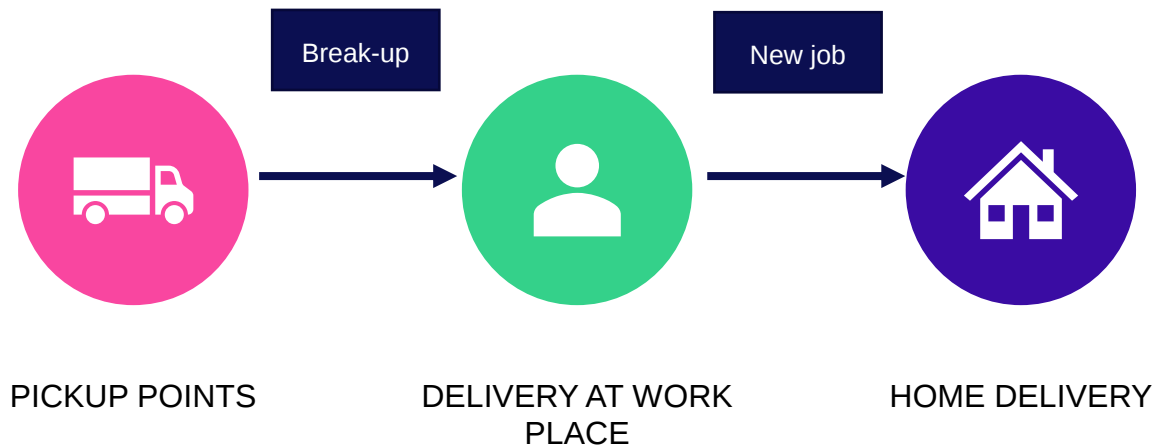


Figure 3: Elena's changes of delivery choices

Life events can trigger a change in delivery choices because it changes the organisation of daily life, such as it has been the case for Elena. They can also change opportunities and make delivery options available while they were not in the previous situation.

Life events can also modify consumers' values. For example, having children can make pro-sustainability values more important. It has been the case for Giulia for example:

"When you become a mother, you feel that you have to protect your kids and maybe you have to pay more attention to what food you give them or what kind of clothes you buy for them and a lot of things just to make them feel good and have a good health and grow healthy and strong. You're more responsible about what you do. Because I know I'm leaving a world to them, and I would like to leave something nice and good."

Giulia

The Covid-19 pandemic is also an event frequently mentioned by interviewees as triggering online shopping behaviours, but it has never been mentioned as a trigger of a change of delivery method in the conducted interviews.

5.2.2 Friends and social networks' influence

Consumers' social network can also influence their behaviour, especially when it comes to adopting new behaviours. The influence of social network plays an important role in the diffusion of innovations, especially among some consumers more reluctant to novelty (Rogers 1962). For example, Elena explains that when something, like online shopping, requires to use technology, it is more difficult for her to start new behaviours because it is more difficult for her to understand. She's not an *early adopter* but rather belongs to the *late majority* (Rogers 1962).

"I think that also helped me the fact that I was surrounded by people that were used to buy online. I have a lot of friends that buy online, really a lot of friends, and it makes me do it. [...] I mean, it was for me like I'm lazy with the technology. So I don't want to understand how it works because I don't want to. I go to the shop because I know how it works. Instead, watching them, starting doing it with them,

with my friends, especially girlfriends. I understood that it was really easy and so we did maybe together like 'can you buy it also for me' and so I started also to do it by myself."

Elena

It is also the case for adopting new delivery options. Laura explained that one of her friend did not know how to use pickup points and only used home delivery. But when ordering from a second-hand clothes platform, her friend was annoyed because she did not know the precise date of delivery and was planning to work from home several days to receive the parcel and she talked about it with Laura. And that's when Laura explained to her friend the possibility of using a pickup point and the advantages of this delivery method. Now, her friend uses pickup points, so the influence of Laura has triggered a behaviour change.

"[My friend] recently found out about Vinted too. So I kind of introduced her to it, and introduced her to having the packages delivered at the parcel points. So we talked about that a little bit. Yes, because she was not aware of this kind of... No, she thought that she could only have it delivered at our home. So she was telling me she was going to do home office, to be at home, to have the parcel delivered. And she was kind of confused about it because Vinted doesn't really give you a specific day. It just tells you it's going to come, you know, in one of these three days. And so I told her, you know, you can have it delivered at the delivery point and it's much easier. And from that moment on, she became a fan too."

Laura

5.2.3 Opportunity can be a trigger

Sometimes the more sustainable delivery option is also considered by consumers as the most convenient or the cheapest. In that case, behavioural change can be triggered by opportunity. It is for example what Marianne explains:

"There was only one parcel locker [when I moved here]."

Interviewer: Did you use it as much before?

M.: No, because it was a small one. So if it is full, I can't choose it from the website. But like in the last two years, it's been going for one, two, three...it's now four. And I see a lot of people using them as well, so. [It became a habit] when it was easier to get delivered in parcel lockers at my place."

Marianne

Today Marianne uses parcel lockers as soon as she can. She has adapted her behaviour as soon as parcel lockers were made more available by the retailers and transport operators. Marianne is relatively unaware of sustainability issues related to deliveries and returns. More generally, she does not have strong pro-sustainability values. Opportunity and convenience have triggered her behaviour change without raising her awareness. She went directly from 'precontemplation unaware' stage to 'action stage'. But as she is not aware of any issues, she is not in a process where she is trying to sustain the change. Therefore, the risk of relapse is probably bigger for Marianne and consumers with similar processes. As soon as the new delivery behaviour becomes less convenient, they can easily go back to the precontemplation stage.

Even for consumers with awareness on a topic, convenience can also favour a behavioural change. For Anna, delivery price is the real reason for choosing pickup points, even if she is aware and has pro-sustainability values. For example, she became vegetarian to limit her CO₂ emissions. But when it comes to delivery choices, she explains that if pickup points were more expensive than home deliveries, she would choose home delivery.

"And I also always do it at a store, so at a pickup location. One, because it's cheaper, but also because of the environment. So it's not actually a trade-off for

me, because it's good for the environment and it's cheaper. So, yeah, for me... Yeah, and the only trade-off you make is that it doesn't come to your house. But I don't mind because sometimes I'm not at home or then I still need to go to a pick-up location. So I actually like that you can pick it up whenever you want instead of having to be at home. [...] But when the pickup location becomes more expensive than getting it delivered at home, I don't think I will do it. [...] So still money is, I think, a very important issue here."

Anna

Anna's example shows that even aware consumers with pro-environmental values also consider convenience and price when choosing a delivery option. When opportunity is not high, aware consumers with pro-environmental values will not necessarily choose the most sustainable delivery option. This illustrates how different consumers can make very different trade-offs, depending on multiple factors, which will be further explored in D2.4.

5.3 Barriers to behaviour changes and setback triggers

As anticipated in the previous section, each consumer chooses a delivery method based on various factors to which they attach more or less importance. Some of these factors appear to be obstacles to changing behaviour and adopting more sustainable delivery methods. These factors can also cause consumers who have already made the change to go backwards.

5.3.1 Thinking that it is not something that can be solved at consumer level

One of the first barrier to start considering choosing more sustainable deliveries is the fact that some consumers consider that they can't do anything to change how bad the situation is. They consider that if they change behaviour, it won't solve the issue, which is a lot bigger than their choice as a single consumer. It is for example the case of Christine. She considers that working conditions of drivers and people working in warehouses are not normal. And she says:

"It's the working conditions that are unacceptable, but it's not me, as a consumer, who's going to be able to change that."

Christine

She also gave the example of waste sorting, for which she considers that the result of her contribution is nothing compared to what she's asked to do. This example provides us understanding on how demands on consumer to behave in a more sustainable way can be perceived by people.

"Take waste sorting, for example. I see that in my job, I think 10% of the waste is sorted, 10%. And as a small consumer at home, I'm asked to sort waste, to have a collection of garbage cans in my house. I don't have the space to collect five garbage cans with all the colours and smells. So I'm willing to make an effort, but as a consumer, I have to make a small effort. Ok, it's a small drop in the ocean, but in companies, in jobs, waste sorting is almost non-existent."

Christine

5.3.2 Convenience is important

5.3.2.1 Convenience of returns encourages returns

The perception of the return process is quite different from consumer to consumer. Some of them find returns complicated and try to avoid them. Others think it is really easy, like Jeroen. The fact that returns are very easy, and also free, makes him return lots of clothes. He buys several sizes and return the one that does not fit. And he also says that he shops more often, even clothes he is not sure about, because he knows that it will be easy for him to return the package in a pickup point and it won't cost him anything. According to him, the fact that returns are so convenient and free has made him take this unsustainable habit and also prevents him to change behaviour and make more sustainable return choices.

“That’s more because it’s very easy to return stuff as well. You know, I was always looking at websites or companies that have a free return. But that also makes a lot easier. So I see myself more often now buying like two clothes and then buying their medium and large sizes, because every brand has different sizes, you know, and I’m just in between those two normally. And then I know, oh, you know, it’s free return, so I just buy them both and I get my money back within three, four days anyway. So that makes me shop more, and also more frequently, because if I buy this shirt and it’s not fitting, I just put them back in the package, bring them to a DHL point and then it’s okay, I get my money back anyway. If I had to pay every time two euros for every product I would buy, I would be more cautious with buying, if you know what I mean.”

Jeroen

5.3.2.2 Inconvenience is a strong barrier

When sustainable delivery options are less convenient or even inconvenient, it is also a strong barrier to their adoption. For example, Niels explains that picking parcels up at a pickup point is less convenient for him than receiving them at home. First because he has to organise the pick-up and combine it with his other daily activities. And he could pick his parcels up at his supermarket while shopping groceries, but since he shops groceries in the morning and parcels arrive later, it would imply to wait another day to get the parcel. Niels considers this solution as inconvenient compared to home delivery and thus has not considered to adopt this behaviour so far.

“I don’t go that often to a pickup point for example, or in a supermarket where they have a central location, I mainly choose to deliver at my front door. So that’s really convenient. [...] Otherwise, I have to think about when to pick it up. And mainly I don’t combine it easily with other stuff I have to do. So most of the time, when I do for example groceries for the day, I do it in the morning. Okay, well, I could leave the package there for a day.[...] Then it feels like I miss it and if I order it at home, it will be there. So I have it immediately after delivery”

Niels

This shows that when delivery options are perceived as inconvenient, it prevents consumers from changing behaviour. Sustainable delivery options should still be convenient for consumers to choose them.

5.3.3 Delivery fees are important

In addition to convenience, delivery fees also play a role in behavioural change processes. Jeroen example illustrates it well with the free returns encouraging him to buy more online and return often, despite his awareness about the impacts of returns. It is also the case of Anna. She is an aware consumer who made important behavioural changes in other consumption sectors (she became a vegetarian for example). But when it comes to choosing a delivery option, she explains that she will still be driven by prices and choose the cheapest.

“I think money is a really good incentive. Although I have my principles and stuff, I will still probably go for the cheapest option. I’m still a student”

Anna

Marianne also explains that Norway changed the rules about importation taxes for products bought online. Until recently, there was no tax for products with a value up to 350 NOK (29.8 €). This old rule was in some way encouraging to make small purchases from outside Norway, and indeed Marianne did. But now, from the first crown bought on a foreign website, consumers have to pay taxes in addition to the delivery fees. She explains that it makes her favour Norwegian websites and thus buy more locally with less long-distance transportation.

“I usually order from Norwegian sites. It’s more and more like “we’re a Norwegian website and we have a shipment from Norway so you don’t have to pay for extra

shipping from abroad.” [...] So you kind of, okay, maybe I should order from here instead of something that's shipping from the UK or America or China. [...] Before we could get no tax up to 350 kr. And I think it's a year, maybe two years ago, they took that away. So it's tax from the first krone.”

Marianne

So retailers, as well as public authorities, can utilize price incentive to trigger behavioural change

5.4 Diverse consumers, diverse triggers

Figure 4 summarizes the findings related to behavioural change processes. As we've shown, awareness does not always make consumers choose sustainable delivery options. It can trigger behavioural change when combined with pro-sustainability values. Other factors can play an important role in encouraging or making people change their choices for more sustainable options. Opportunity, when the sustainable option is also more convenient or cheaper, can trigger change, for aware consumers as for unaware consumers. Life events, such as a change in the household composition, moving out or changing job can also make consumers change their behaviour, especially because it often coincides with a change of values or of opportunity. Consumers' social network can also influence them to adopt new behaviours, either by making them more aware and more engaged towards sustainability or by showing and teaching them the opportunity of certain delivery methods.

Relapse to earlier steps in the TTM can also be triggered by different factors, particularly the lack of opportunity – when a delivery option becomes less convenient or more expensive – or life events. Unlike other behaviour changes, stepping back or moving forward in the TTM is more flexible and can be done more easily by consumers, depending on factors such as the type of product ordered (e.g., a heavy and bulky product for which home delivery is exceptionally preferred), the reason for the purchase (e.g., an upcoming birthday prompting the exceptional choice of express delivery), or the delivery options offered by a retailer (e.g., home delivery is very expensive, encouraging the choice of a pickup point), etc.

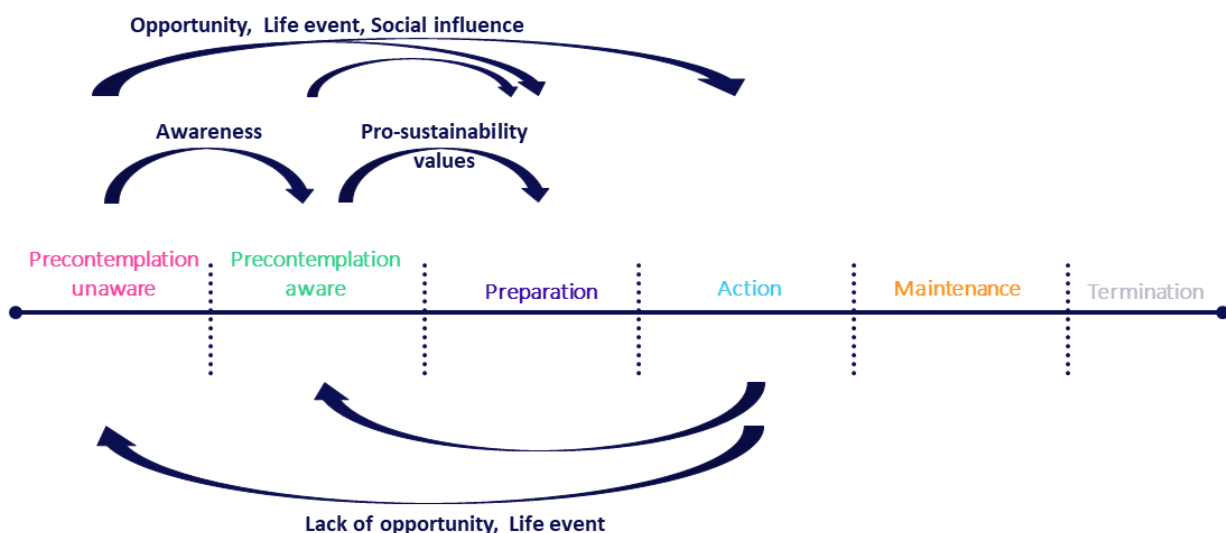


Figure 4: Diagram representing the different processes of behaviour change to choose sustainable delivery and return options, and their triggers

6 Discussion

Price and convenience matter, but awareness is key

Results presented in this deliverable confirm previous findings showing that price and convenience of delivery and return options are important for consumers. But the analysis presented here also shows that awareness is key in changes in attitude. The challenge lies in the fact that no one has a comprehensive understanding of the issues involved in online ordering. While most consumers have some awareness, their knowledge tends to be fragmented and rarely extends to the impacts of last mile delivery.

The deliverable also shows that when they are aware of an issue, consumers can act towards more sustainable behaviours to better align with their value. So, there is potential for behavioural change if consumers become more aware of last mile issues. As price and convenience matters, results also indicate the need for sustainable options to be attractive for consumers. There is a need to give more complete awareness to consumers on the impact of the last mile.

Raising consumers' awareness: the role of retailers and public authorities

The channels to raise awareness detailed in section 4.2 are inspiration for communication guidelines.

Retailers could play a major role in better informing the consumers about the impacts of different delivery options. Sustainable delivery labels could be further developed by providing information and guarantees to ensure consumer trust, without limiting themselves to “green” aspects alone, including also social aspects. Retailers could also offer more detailed information about delivery options, for instance, by dedicating a webpage on their site to explain the differences in terms of impact. For example, the French brand Grain de Sail, which came up with the idea of transporting coffee and chocolate via cargo sailboats, dedicates a page on its online store to detailing the delivery options offered by the brand. It explains why it is preferable to prioritize pickup points over home delivery. This allows them to justify the significant price differences between pickup point deliveries and home deliveries and to explain why home delivery is never offered for free, while delivery in pickup points is free when orders reach 49€. ¹⁰

A notable gap in the sources of information about e-commerce deliveries and returns is also the absence of involvement from public authorities and organizations. None of the interviewed consumers reported receiving knowledge through public information campaigns, even though consumers may welcome the idea of receiving information on deliveries from a non-commercial stakeholder. This contrasts with initiatives in other areas, where public campaigns have successfully guided citizens toward more sustainable behaviours. For instance, “The Big Bag Cut” (Det store posekuttet) ¹¹, led by the Norwegian Retailers' Environment Fund ¹², educated consumers about the environmental impact of plastic bags and encouraged their reduced use. Similarly, Oslo's Climate Action Agency (Klimaetaten i Oslo Kommune) has launched campaigns offering practical advice on reducing household energy consumption ¹³ and celebrating greener Christmases ¹⁴. These efforts highlight the role of public communication in fostering environmentally friendly habits. However, when it comes to the environmental and societal impacts of e-commerce, including the consequences of deliveries and returns, consumers appear to lack comparable guidance. This points to a missed opportunity for authorities and organizations to address an emerging issue with the same strategic focus applied to other sustainability topics. Among others, municipalities could play an important part in informing consumers about the consequences of deliveries and returns.

¹⁰ [Modalité de livraison - Grain de Sail](#), accessed on the 24/01/2025.

¹¹ [Det store posekuttet](#), accessed on the 06/12/2024.

¹² [About the Norwegian Retailers' Environment Fund - HMF](#), accessed on the 06/12/2024.

¹³ [Spar på strømmen med enkle grep!](#), accessed on the 06/12/2024.

¹⁴ [Slik gjør du det: Her er 15 tips for å feire en grønnere jul](#), accessed on the 06/12/2024.

Engaging consumers through targeted strategies

The results presented in the deliverable reveal that shifting behaviour toward more sustainable delivery and return options is a gradual process. Each consumer experiences this process differently, with various events potentially triggering new behaviours. The Transtheoretical Model (TTM) offers a valuable framework for understanding these behaviours because it views them as evolving processes, with the possibility of regressing to earlier stages. However, unlike behaviours such as smoking cessation—where the choice is binary—the behaviour examined here, opting for more sustainable delivery options, is far more nuanced and includes a range of variations. Consumers do not consistently choose the same delivery option; instead, they adapt their choices to specific situations. This variability makes it challenging to assign a consumer to a particular stage definitively.

The deliverable offers valuable insights into engaging with different types of consumers and serves as a foundation for developing communication guidelines tailored to different consumer profiles, as well as specific situations they encounter. For instance, communication strategies could focus on consumers undergoing significant life events, framing these moments as opportunities to encourage positive behavioural changes.

The results presented here also reaffirm the common gap between intentions (what consumers plan to do) and actual behaviours (what they ultimately do). This underscores the importance of leveraging implementation intentions as a communication strategy to guide consumers. By providing clear, actionable steps tied to specific triggers, implementation intentions can contribute to bridging this gap, making it easier for consumers to align their actions with their goals. Effectively, this approach not only informs consumers about what needs to be done but also helps them navigate the path toward achieving their intentions.

7 Conclusions

Deliverable 2.2 sheds light on consumers' awareness regarding the consequences of e-commerce deliveries and returns, as well as the processes that lead them toward more sustainable choices. Through biographical interviews with consumers from four European countries, several key insights emerge:

- **Limited awareness:** Consumers generally lack a comprehensive understanding of the environmental and societal impacts of their delivery choices, particularly those who do not prioritize sustainability in their decision-making.
- **Minimal stakeholder influence:** Retailers and public authorities currently play a limited role in enhancing consumer awareness on sustainable delivery options.
- **Behavioural change triggers:** Awareness of the consequences can prompt behavioural change, but only when aligned with individual pro-sustainability values or when sustainable delivery options also imply convenient and cost-effective alternatives.

These findings highlight critical gaps in consumer awareness and stakeholder action that must be addressed to foster the adoption of sustainable delivery and return practices. Increasing consumer knowledge, coupled with strategic interventions by retailers and policymakers, has the potential to drive significant behavioural change.

Looking ahead, these conclusions provide actionable insights for the development of KPIs to measure behavioural change (WP3) and communication guidelines to engage consumers effectively (WP4).

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Annex A: Interview guide

Introduction

- Introduce myself
- Present the project CodeZERO
- Review consent
- Start registration
- Ask the participant to introduce his/herself

Background information about online shopping

I'm interested in how people shop online and what makes them choose a delivery option rather than another. Could you please tell me your experiences shopping online? How has it evolved over time?

- Can you tell me how, when, what you shop online?
- What sort of products do you order when you shop online?
- How often?
- Why do you shop online?
- What makes you order online and not go to the shops?
- What are the platforms/online shops you use?
- Can you describe the last online shopping you did? How did it happen?
- Can you tell me if you use your PC or your mobile?
- Do you order online for others or yourself?
- Have you always done so? Can you explain to me how you used to shop online, if you think about how you did it a few years ago? Have you observed changes?
- Do you remember how/when you started to shop online? Could you describe how it was at the beginning?
- Can you think about things or events that have made you change your online shopping habits?

Delivery/Return choices

In general, can you tell me how you choose the delivery mode when you shop online? What is important to you? What do you emphasize?

- For example, the last time you bought something online, which delivery option did you choose? How did you choose?
- What is your favourite delivery mode? Can you explain me why?
- What delivery options do you normally have to choose from?
- What factors can influence your delivery choices?
- When you ordered ... [product mentioned before], what kind of delivery did you chose?
- Can you tell me about how you return things you order online? Can you give me examples? For example, when/what was the last time you returned something?
- How has it evolved over time? Please try to remember how you did before. Was it different?
- Can you think about things or events that have made you change your choices of delivery options?

Awareness level and behaviour changes

I am also interested in what people know about delivery and returns options.

- When you shop online, do you think about how things arrive at your doorstep/click and collect point?
- How important is it for you to know what happens to get the product to you?
- Can you tell me what you know about the different delivery options and their impacts?
- Where/How did you learn things about the consequences of e-commerce deliveries and returns?
- Why were you interested in the topic?

- What impact has it had on your behaviour when you shop online? Could you tell me everything that has happened so far when it comes to awareness and choice of deliveries?
- According to you, what is a sustainable delivery or return option?

By “sustainable delivery option” we mean a way of delivering your product that does not harm society. It can be more friendly to the environment, provide more equitable working conditions, support local businesses or be safer than traditional delivery methods.

- Is it something you have heard of? Do you know something about it?
- Can you please tell when/what you have heard about the sustainability or lack of sustainability of deliveries and returns due to e-commerce for the first time?

To aware consumers:

- Do you remember when choosing sustainable delivery options became a topic of conversation? What was it about?
- Can you please tell me if and how you changed your choices of delivery options, your online consumption behaviour...to make it more sustainable? Can you please explain me what changes and adjustments you made?
- How did you do before the change?
- How did you prepare and plan for changing your behaviour?

Values, norms, pro-environmental behaviours

I am also interested in how much sustainability is important in your daily routines? Can you tell me how much you adjusted or changed them to be more sustainable? Explain me how it happened.

- More generally, what is important to you regarding your consumption?
- What do you prioritize when you are buying something?
- Do you remember when you have started to think about the sustainability of your consumption? Can you explain to me what it was about? What was interesting for you?
- Can you please tell me if and how you changed your consumption behaviour to make it more sustainable? Can you please explain me what changes and adjustments you made?
- Are there other parts of your daily routines where you are thinking about sustainability? What kind of adjustments/changes have you made?

Sociodemographic & Awareness level questions

- Ask the participant to fill in the two forms (cf. Annexes B and C).

Annex B: Sociodemographic questions

Age group

- ☐ 18-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ 61-70
- ☐ 71-80
- ☐ 81+ years old

Gender

- ☐ Female
- ☐ Male
- ☐ Prefer not to disclose / Other

Type of residential area

- ☐ City centre
- ☐ Suburb outside the city centre or on outer edge of the city
- ☐ Small town or residential area outside the city
- ☐ Rural area
- ☐ Other:

Household type

- ☐ Single without children
- ☐ Single with one or more children
- ☐ Couple without children
- ☐ Couple with one or more children
- ☐ Other

Education level:

- ☐ High school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctorate
- ☐ Other technical, college education or apprenticeship
- ☐ Prefer not to disclose / None

Annex C: Questions on awareness and behaviour

Do you agree with the following statements?

Statement	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
I prioritize cheap and practical delivery/return options over sustainable options					
I am willing to pay extra for a sustainable delivery/return option					
I never choose one delivery option over another because of sustainability					
I realize that some ways of delivering products ordered online are more sustainable than others					
I know which delivery and return options are better for the environment					
I realize some delivery alternatives involve poorer working conditions for warehouse workers and delivery personnel					
I normally choose home delivery when I order online					
I usually choose the fastest delivery alternative					
When I order clothes or shoes online, I often return some of the products I have ordered					
I don't usually notice sustainability of delivery/return options that are offered online					

Annex D: Participants record

Given name	Country	Age group	Gender	Type residential area	Type household	Education	Awareness Indicator
Ella	Norway	18-30	Female	City centre	Single without children	Master' s degree	-2,5
Maia	Norway	18-30	Female	City centre	Other / do not wish to say	High school	-1
Ingeborg	Norway	61-70	Female	City centre	Single without children	Bachelor' s degree	2,5
Marianne	Norway	41-50	Female	Suburb outside the city centre or on outer edge of the city	Single without children	Other higher education	1,5
Julie	Belgium	31-40	Female	City centre	Single without children	Master' s degree	6
Nathalie	Belgium	51-60	Female	City centre	Single without children	Master' s degree	-1
Colette	Belgium	31-40	Female	City centre	Couple without children	Master' s degree	3
Célia	Belgium	31-40	Female	City centre	Couple without children	Master' s degree	6
Mei	Belgium	18-30	Female	Suburb outside the city centre or on outer edge of the city	Single without children	Master' s degree	1,5
Christine	Belgium	51-60	Female	Suburb outside the city centre or on outer edge of the city	Single without children	Bachelor' s degree	-4

Given name	Country	Age group	Gender	Type residential area	Type household	Education	Awareness Indicator
Tim	The Netherlands	18-30	Male	Suburb outside the city centre or on outer edge of the city	Other / do not wish to say	Master' s degree	4,5
Niels	The Netherlands	18-30	Male	City centre	Other / do not wish to say	Bachelor' s degree	2
Jeroen	The Netherlands	18-30	Male	City centre	Single without children	Master' s degree	1
Anna	The Netherlands	18-30	Female	City centre	Other / do not wish to say	Master' s degree	5
Jacob	The Netherlands	18-30	Male	City centre	Other / do not wish to say	Master' s degree	0,5
Emil	Norway	31-40	Male	City centre	Single without children	Bachelor' s degree	-0,5
Giulia	Italy	51-60	Female	City centre	Couple with 1+ children	Master' s degree	6,5
Silvia	Italy	51-60	Female	City centre	Couple with 1+ children	High school	4,5
Francesca	Italy	61-70	Female	City centre	Couple without children	High school	5
Elena	Italy	31-40	Female	City centre	Single without children	Master' s degree	3
Laura	Italy	18-30	Female	Rural area	Other / do not wish to say	Master' s degree	6,5

Annex E: Overview of consumers' awareness areas

General area	Specific issue	Aware consumers
Working conditions	Working conditions of riders, drivers and warehouses' workers	Ingeborg, Julie, Nathalie Colette, Christine, Jacob, Sylvia, Francesca, Elena
	Working conditions of manufacturers	Maia, Julie, Emil
Support local businesses	Buying online threatens the viability of local shops	Ingeborg, Colette, Sylvia
Returns	Returned products are rarely put back on sale	Marianne, Julie, Célia, Jeroen, Jacob
	Environmental costs of returns transport	Colette, Tim, Laura
Packaging	Too much packaging	Ella, Nathalie, Mei
Transportation in general (incl. long distance)	Local or national storage avoids long distance shipping	Marianne, Julie, Nathalie, Emil, Laura
	Some transportation modes are more sustainable	Marianne, Julie, Nathalie, Colette, Tim, Jeroen, Jacob, Emil, Francesca, Laura
	Inefficient deliveries imply more CO ₂ emissions	Julie
	Buying second hand in Europe implies less transportation impact than buying new products manufactured in Asia	Colette
	Purchasing something implies transportation and thus is not sustainable so I am trying to buy less	Colette, Tim, Jeroen, Laura
Last mile	Receiving several products at the same time is more sustainable	Colette, Sylvia, Laura, Niels
	Pickup points are more efficient and better for the environment than home delivery as they avoid trips	Célia, Jeroen, Anna, Giulia, Laura, Tim, Niels, Jacob
	Deliveries imply pollution in cities	Giulia, Sylvia, Niels
	Deliveries imply safety issues in cities	Jeroen, Giulia, Laura
	Fast deliveries imply lack of consolidation of shipment	Julie, Anna