# ASSESSMENT FRAMEWORK FOR CONSUMER'S BEHAVIOUR CHANGE

## Project deliverable D3.2

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# List of abbreviations and acronyms

| Acronym | Meaning |
| --- | --- |
| AC | Awareness of consequences |
| AR | Ascription of responsibility |
| IBM | Integrated Behavioural Model |
| NAM | Norm Activation Model |
| PBC | Perceived Behavioural Control |
| SCB | Sustainable Consumer Behaviour |
| SSBC | Stage model of Self-regulated Behavioural Change |
| TPB | Theory of Planned Behaviour |
| TTM | Transtheoretical Model of Behavioural Change |
| VBN | Value Belief Norm |

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# Abstract

The rapid growth of e-commerce and the increasing environmental impact of last-mile logistics have heightened the need to better understand how communication strategies can influence consumer delivery choices. This deliverable develops a framework for evaluating communication interventions and changes in consumer delivery choices in the context of online shopping. The framework is based on insights from previous and forthcoming CodeZERO deliverables supplemented with a review of behavioural change theories, decision-making models, and existing evaluation frameworks.

A model for the framework was developed in two parts: one to assess the communication intervention and one to evaluate the effect of communication on consumer delivery behaviour. Based on this model, a framework describing measures to assess was then developed. The framework comprises:

- a description of the communication interventions, detailing their format, content, and outputs
- a set of 28 Key Performance Indicators (KPIs) for measuring the effectiveness of the communication interventions on consumer behaviour
- additional evaluation components providing qualitative and contextual elements necessary for interpreting the KPIs.

The framework will be applied to the evaluation of communication interventions within the pilots conducted in the CodeZERO project. By enabling an evaluation of both the process and the outcomes of communication measures, the framework is broadly applicable, supporting the analysis of other communication campaigns targeting online consumers beyond the scope of the project.

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# Executive Summary

CodeZERO aims to co-create and test sustainable last-mile delivery and return solutions for e-commerce along with communication guidelines on how to influence consumer choice of delivery option. Communication methods, developed using the guidelines, will be implemented and tested along with delivery solutions in four pilots in European cities. This Deliverable presents a framework for the evaluation of communication measures implemented in the CodeZERO pilots. The framework is developed with a view to its future use by practitioners and retailers needing to evaluate communications with consumers about sustainable delivery choices.

The framework comprises a set of indicators that can be used to measure how and to what extent communication about sustainable delivery and return options has influenced consumer delivery choice. The framework is based on a two-part model of factors that need to be measured to assess:

1. The mechanism by which communication influences consumer choice of delivery option.
2. The characteristics and effectiveness of communication intervention.

The two-part model was developed based on a review of CodeZERO findings, behavioural change theories, and evidence-based frameworks for evaluating change in sustainable consumption behaviour.

### *CodeZERO findings*

CodeZERO findings reveal several key influences on consumer choice of delivery option:

- Delivery attributes—e.g., price of delivery; delivery time, punctuation and precision; vehicle type used
- Consumer goals and motivations, which can depend on product type and reason for ordering; key goals are cost, convenience, delivery speed, safety/carrier quality and sustainability
- Consumer awareness of how choice of delivery has diverse effects on sustainability
- Trust in the sustainability message and its sender
- Belief and that it is possible to choose and individual choices matter
- Physical environment (e.g., accessible pick-up points and shops)
- Digital environment (e.g., interface design, visibility of preferred choices)
- Previous experience with delivery options, which links to national variations in use of different methods such as parcel lockers.

These influences should be accounted for when trying to understand if and how a retailer communication has changed consumer delivery choice.

### *Theory review*

A review of behavioural change theories finds that in addition to the above factors, the intention of a consumer to choose sustainable delivery will be influenced by their attitudes to sustainable delivery, their perceptions about the choices of other consumers ("social norms"), and the extent to which they feel responsible for sustainable outcomes. Intention to choose a sustainable delivery or return option is only one of several factors that determine actual consumer choice. The latter is also influenced by the extent to which the consumer knows how to plan for or carry out a choice (e.g. how to collect from a parcel locker after choosing it as a delivery option), and the extent to which the delivery choice is habitual or visible to the consumer.

Decision-making and nudging theories provide valuable insights into how communications can influence consumer delivery choices. They suggest that the framework should also consider how consumers:

- trade-off and prioritize several of goals depending on the product type and reasons for ordering (e.g. deadlines to be met); and
- think rationally and/or intuitively when ordering.

### Existing frameworks for evaluating sustainable consumption behaviour

To inform the second part of the model, about the characteristics, implementation and reach of the communication intervention itself, frameworks for the evaluation of sustainable consumer behaviour (SCB) communications were also reviewed. Because the frameworks reviewed cover some of the same factors already mentioned (e.g., consumer goals, social norms, habits, attitudes, values, and the ability of the consumer to choose a delivery option), this review served two purposes: first, it confirmed that these factors are appropriate for building the first part of the model; second, it identified additional factors that should be considered when assessing the communication interventions. It finds that tangibility of the message has been a challenge for many communications aimed at increasing sustainability behaviour, since the consumer is asked to put aside short-term gains for themselves in favour of distant, abstract gains for the collective. Sustainability messages should therefore be explicit about why choice changes matter. Evaluation of communications should also account for how messages are timed along different points in the "customer journey" (e.g., planning online shopping, doing online shopping, or during delivery). In addition, evaluations should document how well the communication was implemented and the extent to which consumers attended to and processed the message. Characteristics of the interface, such as its useability or use of marketing campaigns that counter sustainable choice, should also be considered.

### CodeZERO model

Findings from the above reviews were used to develop the two-part model shown in Figure 1. Understanding the effects of communication on delivery choice involves documenting the nature of information conveyed in the communication, how well communication was implemented, and whether the message reached the consumers targeted (top pink box, Figure 1).
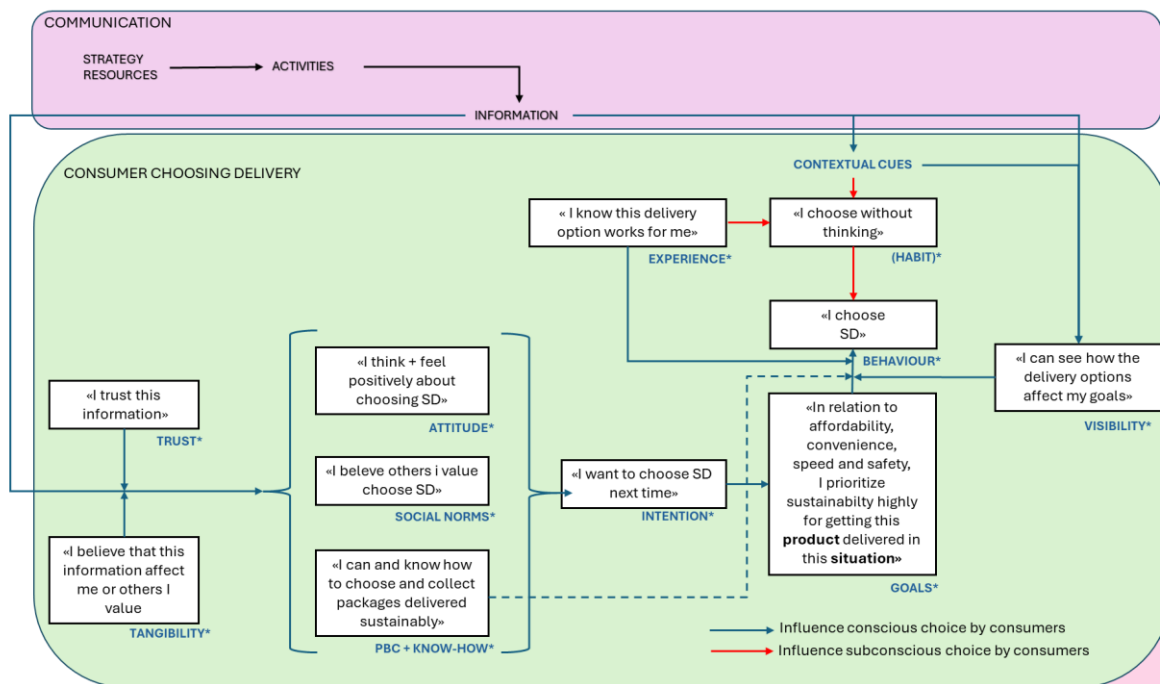


Figure 1: Two-part model of how communication influences choice of delivery option by consumer

Any evaluation of consumer choice should help practitioners understand *how* communication succeeded or failed in changing consumer behaviour, so that they can make improvements. An important aspect of the model, therefore, is that it makes clear links between information communicated and the mechanism of its effect (bottom green box, Figure 1). Three main mechanisms are apparent

(see lines leading from "INFORMATION"), depending on whether the information communicated changes:

- consumer **intentions** to choose sustainable delivery options
- **visibility** of how delivery options vary in relation to the consumer's prioritized goals
- **contextual cues** given by the online interface or in the physical environment that encourage habitual or changed choice of delivery option (e.g. nudging).

### *CodeZERO framework*

Based on Figure 1, the CodeZERO framework for evaluating communication interventions and consumer delivery choices can be presented (Table 1). It comprises three parts that describe the communication intervention, assess its impact using key performance indicators (KPIs), and assess *how* any change in delivery choice by consumers has been achieved.

*Table 1: CodeZERO framework for evaluation of communication measures*

| Framework part | Evaluation theme |
|---|---|
| **Description of communication** | Strategy and resources |
| | Activities and efficacy of execution |
| | Outputs |
| **Impact of communication on consumers and their delivery choice (KPIs)** | Retention of message |
| | Comprehension of message |
| | Attention to message |
| | Satisfaction with online checkout |
| | Trust in message |
| | Tangibility of message |
| | Awareness of sustainable delivery/return choice |
| | Attitude to target delivery/return option |
| | Social norms (beliefs about what others choose) |
| | Perceived difficulty of implementation of the delivery option |
| | Intention to choose target delivery option next time |
| | Intention to choose target delivery option online |
| | Ranking of sustainability among other goals |
| | Experienced satisfaction with delivery option chosen |
| | Know-how to choose and collect |

| Framework part | Evaluation theme |
|---|---|
| | Visibility of choice between options |
| | Degree to which choice is habit |
| | Delivery choice |
| | Collection parameters (distance, means, trip-chaining) |
| **How impact was achieved (additional evaluation components)** | Target audience reach |
| | Information and contextual cues |
| | Knowledge and awareness of delivery option |
| | Life events |
| | Perceived behavioural control |
| | Pre-choice delivery experience |
| | Determinants of habit |
| | Product type ordered |
| | Characteristics of ordering situation |
| | Extra delivery choice parameters |
| | Collection parameters |
| | Consumer sociodemographics |
| | Consumer values |

The framework is designed to be flexible and adaptable. While it offers a clear structure, practitioners should select evaluation measures from this framework according to the purpose of the evaluation, the specific communication intervention being evaluated and the supposed mechanism of effect of communication on behaviour of the consumers targeted. Sample size, experimental design and data collection methods and tools can each influence choice of KPIs and other components to evaluate when assessing the impact of communication interventions. To assist practitioners, use of the framework is illustrated with two examples:

- assessment of communication measures and behaviour change when communicating about the lower impact of pickup points on sustainability; and
- assessment of communication measures and change in return behaviour.

Beyond supporting the pilots in this project, the framework has the broader ambition of serving as a general tool that can be adapted to assess other communication campaigns targeting online consumers. In addition, the two models developed will help shape the communication guidelines for CodeZERO (Deliverable 4.3), ensuring future strategies are evidence-based and adaptable to various online retail contexts.

**This deliverable is to be approved by the European Commission**

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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.

One of the aims of CodeZERO is to develop communication guidelines that retailers, logistics service providers and public authorities can use to promote sustainable delivery choices by online consumers.

## 1.2   Aim of this deliverable

This deliverable presents a framework for measuring the ability of communication measures to increase adoption by consumers of zero-emission delivery and return options. To do this, the framework assesses the content, implementation and effectiveness of communications in:

- addressing consumers' need for information about the different options offered by retailers
- raising consumers' awareness of the sustainability of different delivery options

- motivating consumers to choose more over less sustainable options
- conveying sustainable options as attractive options.

The deliverable presents a methodological basis for this assessment, as well as a set of indicators to measure whether and to what extent communication about zero-emission delivery and return options influence consumers' choice of sustainable delivery options. Both the methodology and KPIs developed are based on a review of i) relevant models of behavioural change; jj) existing frameworks developed to evaluate change in sustainable consumer behaviour; and iii) findings from CodeZERO available in **Deliverables 1.1, 2.2, 2.3**, along with preliminary findings from **Deliverables 2.1 and 2.5**.

The methodological framework presented in Deliverable 3.2 will be used in WP5 to assess the communication measures implemented in CodeZERO pilots.

The document is structured as follows:

- Chapter 2 presents the methodology used to build the framework and develop the KPIs,
- Chapter 3 reviews relevant findings from CodeZERO deliverables,
- Chapter 4 introduces different theories and models of behaviour change and decision-making to discuss them in the light of CodeZERO deliverables and select important factors to integrate in the framework,
- Chapter 5 reviews frameworks evaluating change in sustainable consumer behaviour and communication interventions,
- Chapter 6 builds on Chapters 3, 4 and 5 to develop a model and KPIs, which together form the CodeZERO framework for assessment of communication interventions,
- Chapter 7 illustrates practical application of the framework.

# 2   Methodology

The methodological approach used to develop the assessment framework is based on a multi-step process, as described in the following sections.

First, key findings from previous CodeZERO completed and ongoing tasks were reviewed and structured along key behavioural change and decision-making theories.

Second, existing theoretical frameworks for assessing communications and behavioural change were reviewed to identify the most relevant aspects for CodeZERO goals.

Finally, two models (one model for assessing changes to delivery choice behaviour and one for evaluating the impact of communication) were developed to inform the definition of CodeZERO assessment framework.

## 2.1   CodeZERO findings and key theories on behavioural change and decision-making

Findings from previous CodeZERO completed and ongoing tasks, as reported in D1.1, D2.2, D2.3 and upcoming D2.1 and D2.5, were reviewed for identifying relevant insights on the evaluation of the effect of a communication intervention on consumer choice of delivery option.

To inform how to structure CodeZERO findings in terms of a behavioural model for delivery choice, theories of behavioural change and environmental behaviour were reviewed based on the authors' existing knowledge and key predictors of behaviour change from relevant chapters of *Environmental psychology: an introduction* (Steg and de Groot 2019), namely:

- 'Theories to explain environmental behaviour' (Steg and Nordlund 2019),
- 'Yesterday's Habits Preventing Change for Tomorrow? About the Influence of Automaticity on Environmental Behaviour' (Klöckner and Verplanken 2019),
- 'Processes of change' (Bamberg and Schulte 2019).

The strength of predictors of pro-environmental behaviour was then specified based on meta-analysis papers.

Behavioural change theories were supplemented with a description of the Decision Ladder[1] as it gives a theoretical basis for assessing communications made as consumers choose delivery options online. The Decision Ladder allows to account for the findings of Deliverable 2.3 on real-time decision-making in the CodeZERO assessment framework.

Finally, nudging theory was also reviewed based on the authors' existing knowledge.

## 2.2   Review of relevant existing assessment frameworks

Since delivery choice is a form of behaviour, existing frameworks for assessing communications and behavioural change were reviewed.

### 2.2.1   Frameworks for assessing behavioural change

Frameworks for assessing behavioural change were identified as follows:

- The phrases "framework for measuring sustainable choice by online consumers" and "framework for measuring consumer behavio[u]ral change" were entered into Google Scholar and the first five pages reviewed in each case. Articles were included based on their relevance to assessing an informational intervention for changing delivery choice by online consumers. Articles on similar frameworks were excluded because of redundancy (e.g. the COM-B framework of Ran et al. (2022) subsumes Lambe et al. (2020) framework while Yener, Secer,

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[1] The Decision Ladder is a conceptual model describing the cognitive steps individuals take to make decisions.

and Ghazalian (2023) cover factors of the COM-B framework – so only Ran et al. (2022) was selected).

- Two searches were performed by entering the keywords i) "behavioural", "change" and "evaluation"; and ii) "consumer", "sustainability" and "choice" into the EC CORDIS database (cordis.europa.eu/search).
- Review of recent accounts of drivers of online consumer product and delivery choice, described in CodeZERO Deliverables (Fiorello et al. 2024; Pernot, Phillips, and Saghafian 2025; Phillips and Pernot 2025), as well as the upcoming deliverables 2.1 and 2.5.

Studies and projects dealing with societal-level influences on consumer behaviour (e.g. economic, cultural or governance aspects) were excluded (e.g. ENABLE.EU).

### 2.2.2 Frameworks for assessing communication interventions

As per the identification of frameworks for assessing communication interventions, an exploratory query on ChatGPT 4o ("What is a good framework for evaluating communication-based interventions?") was first made. It was then coupled with and verified by two searches on Google Scholar: i) "framework" + "measure" + "consumer" + "behaviour" + "change" and ii) "framework" + "measure" + "online" "consumer" + "delivery" + "choice". The first two pages of Google Scholar were reviewed, and the most relevant articles were then retrieved, and original sources reviewed.

The search was supplemented with a search for relevant EU projects using the keywords "behaviour". "change", "evaluation" and "framework" on the EU CORDIS database.

## 2.3 Developing the framework

CodeZERO framework consists of a methodological basis and indicators to measure whether and to what extent communication about sustainable delivery and return options influence consumers' choice.

The framework therefore should assess i) behaviour change, i.e., change towards more sustainable delivery choice, and ii) the efficiency of communication measures in influencing this choice.

To build the framework, two models are needed:

- one model for assessing changes to delivery choice behaviour
- one model for evaluating communication

The first model should explain how consumers choose delivery options and requires identifying the different factors influencing this choice and the relations between them. Based on findings from CodeZERO and inputs from theories, a first list of main influences on consumer behaviour was drawn up. A review of previous frameworks enabled to supplement the list of influences. A model presenting influences on consumer choice of sustainable delivery and return options was then built and is presented in 6.3. This model will serve as a basis for developing targeted communication strategies in CodeZERO (Task 4.3).

The review of previous frameworks also provided other factors to account for assessing the effectiveness of communication strategies and enabling the development of the second model, presented in 6.2. Both models constitute the basis of CodeZERO assessment framework for communication interventions and consumer delivery choices.

Based on the models, a list of evaluation components and KPIs was identified to constitute the assessment framework evaluating behaviour change among consumers, i.e. whether and to what extent do they choose more sustainable delivery options. As communication guidelines are not yet formulated, the assessment of the effectiveness of the implementation has been initiated in this task and will be further developed when formulating the specific communication measures.

# 3 Key findings from CodeZERO deliverables

This chapter presents key findings from CodeZERO deliverables that have informed the development of the assessment framework. The selected results outlined below provide the foundation upon which the framework has been constructed, highlighting the most critical elements of consumers behaviour identified during the project.

## 3.1 Delivery attributes

When assessing whether and how behavioural change has been achieved due to communication, it is important to account for how the content of new delivery options affects the consumer's behavioural choice. For instance, it is well established that many consumers are unwilling to choose delivery options that are less affordable or less convenient. These and other so-called delivery option 'attributes' are dealt with in CodeZERO Deliverable 1.1 (Fiorello et al. 2024). Deliverable 2.3 (see section 3.4) is also relevant, finding that delivery attributes such as cost and flexibility in the choice of delivery timing and location are key to consumer satisfaction. This suggests delivery attributes can influence consumer choice of delivery option both directly and indirectly. Delivery attributes that would be of interest to evaluate are:

- Price of delivery
- Delivery time, punctuality, precision
- Delivery time consolidation (whether several packages are combined as a single delivery or delivered separately)
- Point of delivery
- Vehicle type used
- Tracking information, reminders.

## 3.2 Typologies of consumers and behavioural change drivers

CodeZERO Deliverable 2.1 (Cauwelier, Lebeau, and Buldeo Rai 2025) aimed to identify a range of consumers groups suited to different behavioural change strategies by mapping the factors that influence delivery and return choices, with a focus on sustainability. Through a literature review, the deliverable explored how sociodemographic, geographic, attitudinal characteristics and core behavioural drivers (i.e., motivation, habit, and opportunity) shape consumer preferences. This ultimately contributes to the development of distinct consumer personas to support targeted interventions throughout WP2.

### *Demographic and behavioural variability*

The link between demographics and sustainable delivery behaviour remains inconclusive. Some studies show education and gender positively influence green choices, while others suggest these characteristics have limited influence once consumers become experienced online shoppers. These mixed findings point to the need for behavioural strategies that go beyond demographics and instead target attitudes, motivations, and contextual factors to effectively promote sustainable delivery choices.

### *Motivation*

Understanding motivation is essential to grasp how individuals behave and engage in pro-environmental actions. Consumer motivation to act sustainably is shaped by both intrinsic and extrinsic factors. Intrinsic motivation stems from personal values, while extrinsic motivation is influenced by external incentives and or social pressure. Some consumers are willing to choose sustainable delivery options because they believe in the environmental cause, while others respond to financial incentives. These insights align with behavioural models such as the Theory of Planned Behaviour (TPB) and the Norm Activation Model (NAM) (see 4.1.1 and 4.1.2). Literature suggests that intrinsic drivers are more effective for long-term behavioural change.

### *Habit*

While motivation drives initial choices, it is often habits that determine whether sustainable behaviour becomes routine. Therefore, habits strongly influence consumer behaviour in online shopping, often

overriding stated intentions or attitudes. Many consumers default to home delivery due to convenience, or because they have limited experience with other delivery alternatives such as parcel lockers. The findings from the literature highlights the importance of interventions that disrupt habitual patterns, such as defaulting to sustainable options, using green labels as decision reminders, or offering tangible incentives for alternative behaviours.

### *Opportunity*

Even motivated consumers may not act sustainably if they lack opportunity. Structural barriers such as limited delivery options, high delivery prices, or poor accessibility reduce the likelihood of choosing sustainable alternatives. Additionally, cognitive barriers, like unclear information, can also hinder action. This underlines the need to improve transparency and accessibility of sustainable delivery options to remove barriers and enable more sustainable consumer behaviour.

### *Consumer preferences and personas*

Despite growing awareness of environmental impacts, delivery preferences remain heavily influenced by price and convenience. However, not all consumers are the same and this will impact their reaction on the different behavioural change strategies.

Building on the behavioural insights, D2.1 defines four personas:

1. **Pro-Sustainable Consumers**: intrinsically motivated and well-informed. They want and choose for sustainable delivery options. Often, they are early adopters and or influencers in their networks.
2. **Uncommitted Consumers:** low motivation but high opportunity (sustainable options are available to them). They can be nudged through incentives or default changes.
3. **Ignorant Consumers:** motivated but face knowledge or access barriers. They need clearer communication and habit-breaking interventions.
4. **Careless Consumers:** low motivation and awareness. They may respond to simplified messages or gamification.

These personas offer a framework for tailoring behavioural change strategies to different consumer profiles. By understanding and responding to the drivers and barriers each group faces, more effective interventions can be developed to promote sustainable delivery and return behaviours in e-commerce.

## 3.3  Consumers' awareness and behaviour change

Based on in-depth interviews with online consumers, CodeZERO Deliverable 2.2 (Pernot, Phillips, and Saghafian 2025) provides valuable insights into consumers' awareness regarding the societal impacts of e-commerce deliveries and returns. The research examines how awareness influences behavioural changes, specifically towards choosing more sustainable delivery options.

### *Consumer awareness*

The findings indicate that consumers generally exhibit some awareness about sustainability issues related to online shopping. However, there remains a substantial gap regarding understanding the impacts associated with last-mile deliveries, particularly among individuals with lower pro-sustainability values. Even among those who are aware, their knowledge tends to be fragmented, focused on certain aspects rather than considering the full scope of the issues. Consequently, consumer awareness about the overall impacts of e-commerce deliveries and returns remains incomplete. For consumers with strong pro-sustainability values, this fragmented knowledge represents a critical limiting factor in achieving broader behavioural change towards more sustainable delivery and return choices.

### *Variability in sustainability values*

The deliverable highlights the diversity in consumer perspectives regarding sustainability. Some consumers emphasize global environmental issues, such as global warming and carbon emissions, while others prioritize social and economic dimensions, including employment conditions and the sustainability of local businesses. These findings underscore the necessity of adopting a comprehensive definition of sustainability that encompasses environmental, social, and economic

aspects to fully address consumer concerns, whether they have altruistic or biospheric values (section 4.1.3), and effectively encourage sustainable choices.

Additionally, the research emphasizes that consumers who don't believe their individual actions can positively impact society are less inclined to adopt sustainable behaviours, something that resonates with outcome efficacy in the Norm Activation Model (NAM) (section 4.1.2).

### *Trust and information authenticity*

Consumers demonstrate considerable scepticism towards sustainability-related information provided by retailers. Due to widespread awareness of greenwashing practices, consumers actively seek trustworthy evidence and genuine commitment from businesses regarding their sustainability claims. Transparency and authenticity in communication emerge as critical factors influencing consumer trust and decision-making.

### *Influence of socialisation and life events*

The deliverable identifies primary and secondary socialisation as significant factors influencing awareness and behavioural change towards sustainable consumption and e-commerce practices. Additionally, key life events—such as moving to a new home, changing employment, or having a child—play pivotal roles in triggering reassessments of personal behaviours and sustainability practices, and have the potential to provoke changes in habits related to the choice of delivery and returns options.

### *Role of price and convenience*

Lastly, the findings confirm the continuing importance of price and convenience in shaping consumer decisions about delivery options, even among sustainability-aware consumers.

## 3.4  Choice of online delivery option in authentic situations

CodeZERO Deliverable 2.3 (Phillips and Pernot 2025) explored in in-depth interviews and online simulations how consumers choose online delivery in authentic situations. Several addressed factors may be important to consider when evaluating and accounting for the degree of influence of communication interventions on choice of delivery by online consumers. These relate to consumer characteristics and factors related to the consumer's physical and digital environment. Previous delivery experiences are also addressed.

### *Consumer characteristics*

Consumers' particular goals affect choice of delivery options. Cost and convenience are highly prioritised, and speed of delivery, safety and sustainability of delivery appear to be secondary goals. Relative prioritization of each of these five goals vary between consumers but also within consumers, depending on the product being ordered and the reason for ordering it (including any deadlines). The consumers' online use patterns will also affect delivery choice. For instance, the extent to which choice is habitual depends on the frequency of online ordering and use of the platform in question.

### *Physical environment*

Several situational factors can influence delivery choice behaviour and may need to be accounted for to understand the degree of any change in delivery choice as well as the sustainability of delivery choice. These include physical surroundings of the consumer, described by their proximity to shops, work or pick-up points; residence type; household type (do they live with others who can collect?) or means of travel to pick-up or return points.

### *Digital environment*

The timing and location of online ordering and device used (mobile, tablet, pc) can influence the time or attention spent on delivery choice. Aspects of the interface such as the presence or salience of cues consumers attend to may be important to consider if a delivery choice interface is involved e.g. delivery price, preferred delivery method, preferred pick-up or location, narrow time slots, package dimensions, return information, payment icon or carrier icon. Changes to any of these cues can be considered as attempts at communication and evaluated as such (see 6.2). Interfaces can present barriers to delivery choice e.g. by forcing choice of delivery option, presenting confusing or poorly transparent delivery

options, failing to give sustainability or other information about delivery options that consumers need to choose, or presenting delivery choice too early or late in the online ordering process. Interfaces can also present barriers in the form of marketing strategies that distract or align poorly with sustainable delivery choice. Evaluation of barriers to delivery choice might therefore be informative when seeking to understand limits to the degree of behavioural change effected by communication interventions. Promoters of delivery choice can also be considered e.g. standardized, simple eco-labelling of delivery options in which short comprehensible descriptions are provided.

### *Delivery experience*

Experienced consequences of previous delivery may affect willingness to choose that delivery option in the future. Phillips and Pernot (2025) documented several challenging experiences related to degree of consumer control over ongoing delivery, delivery time, communication during delivery, delivery location, returns, carrier behaviour and aspects of the package itself. Consumers' digital and physical interactions with carriers can change how willing they may be to choose that carrier and associated delivery option in the future.

## 3.5 Quantitative analysis of consumer delivery option preferences

CodeZERO Deliverable 2.5 (Cauwelier et al. 2025) explores how online consumers make choices about delivery and return options, especially how trade-offs between price, convenience and sustainability are involved. The main goal is to understand under which conditions consumers are open to more sustainable delivery alternatives. To do this, a choice-based conjoint experiment was set up, supported by a large-scale online survey (N = 10,092) in ten European countries (Belgium, the Netherlands, Italy, France, Spain, Norway, Sweden, Poland, Greece and Germany). The design focuses on key delivery attributes, such as price, speed, reliability, flexibility, location, and packaging building further on insights from D1.1 (Fiorello et al. 2024), D2.2 (Pernot, Phillips, and Saghafian 2025) and D2.3 (Phillips and Pernot 2025).

### *Main drivers of choice*

At the aggregate level, delivery price was the most important factor (41.7%), followed by delivery partner (25.2%) and delivery location (18.5%). Consumers strongly preferred free or low-cost delivery, eco-friendly carriers, and home delivery. Delivery speed, packaging, and tracking information played a secondary role but still influenced preferences, especially when paired with delivery price.

### *Consumer segments and trade-offs*

As mentioned in D2.1 (Cauwelier, Lebeau, and Buldeo Rai 2025), delivery preferences are not uniform across all consumers. Prior studies have identified distinct consumer segments, such as budgeters, convenience seekers, and eco-conscious consumers, each with different thresholds for trade-offs between sustainability, speed, and cost.

In the same vein, in this research, four preference segments emerged from the segmentation analysis:

1. **Price-sensitive consumers** (38%) focus mainly on delivery cost and all the other attributes have a less decisive role.
2. **Location-driven consumers** (15%) prioritise home delivery and are don't want to shift to pick-up points, even if more sustainable.
3. **Service-oriented consumers** (23%) value price but also speed, flexibility, and tracking; they accept sustainable formats if these features are preserved.
4. **Sustainability-driven consumers** (25%) prioritise the choice for an eco-friendly delivery partner and show the highest willingness to pay more to align with environmental values.

Additionally, although there is not an exact match between the while the attitudinal personas from D2.1 (Cauwelier, Lebeau & Buldeo Rai, 2025) and the preference segments, clear patterns emerge. Multinomial logistic regression confirmed that the personas from D2.1 are highly predictive of preference-based consumer profiles. For instance, 'careless consumers' were over 43 times more likely to belong to the price-sensitive segment, while 'pro-sustainable consumers' were by far the most likely to be sustainability-driven. Demographics like age and education, as well as behavioural factors such as recent delivery habits, played only a supporting role.

Simulations confirmed that sustainable delivery options gain traction when tailored to these preferences. For instance, offering free slower delivery for price-conscious users, or reliable, eco-friendly options with tracking for service-oriented consumers.

In sum, while consumers are open to sustainable options, adoption depends on targeted strategies that reflect their motivations, habits, and perceived opportunities, as originally mapped in D2.1 and validated through conjoint analysis in D2.5.

### *Variation across contexts*

While contextual variation exists, it is less pronounced than the differences between consumer segments. Preferences were mainly consistent across product types, though food and circular goods indicated a slightly more price sensitivity and wanted more flexibility in delivery speed. Country differences were slightly more pronounced: for example, parcel lockers were well accepted in Germany and Poland, while home delivery remained dominant in Belgium and the Netherlands. Norway stood out with a strong preference for eco-friendly delivery partners.

Overall, the findings highlight that sustainable behaviour depends on context. Trade-offs are possible, but consumers require targeted options that reflect their priorities which can be the cost, convenience, or environmental impact.

## 3.6   Summary

CodeZERO deliverables highlight diverse influences on online consumers' choice of delivery option, which the assessment framework should account for.

The communication measures and the framework used to evaluate them should be based on an explicit understanding of how consumer choices are made. This will involve clarifying relations between the different influences identified as the framework is constructed. To do so, a model should be built by organising the influencing factors and providing a structure linking them together to explain how delivery choice is made and can be changed. To achieve this, relations between influences on consumer choice presented in the current chapter were considered based on a review of different behavioural and choice theories. This is the subject of the next chapter.

# 4 Theoretical insights

Online delivery choice is a form of sustainable consumption behaviour, which has been defined by Geiger et al. (2018) as follows:

*"…individual acts of satisfying needs in different areas of life by acquiring, using and disposing goods and services that do not compromise the ecological and socio-economic conditions of all people (currently living or in the future) to satisfy their own needs".*

Different theoretical models have been developed to describe processes leading individuals to change behaviour or the choices they make. This chapter briefly reviews theoretical models to highlight the different influences on behavioural change and the relations between them. Reviewed models can and (in some cases) have been applied to different forms of sustainable consumer behaviour.

## 4.1 Behavioural change theories

Starting with the foundational framework of the Theory of Planned Behaviour, this section presents a review of behavioural change theories before presenting subsequent theories as well as theories offering other perspectives on behavioural change analysis. The section ends with a summary where the theories are discussed in the light of CodeZERO results.

### 4.1.1 Theory of planned behaviour

The Theory of Planned Behaviour (TPB) (Ajzen 1985) considers that behaviour depends on the intention to engage in a specific behaviour, where intention corresponds to whether a person is planning to engage in the behaviour (Steg and Nordlund 2019).

According to TPB, intention is predicted by three concepts:

- attitudes towards the behaviour, i.e., the evaluation of the behaviour based on its perceived costs and benefits
- subjective norms, i.e., the perceived social pressure to perform or not a behaviour
- Perceived Behavioural Control (PBC), i.e., whether the individual believes it is possible to engage in the behaviour.

According to the TPB other factors (e.g., sociodemographics, values, beliefs) influence behaviour through the three concepts. TPB has been significantly used to study consumer green behaviour (Rozenkowska 2023), indicating the relevance of accounting for intention and preceding factors in CodeZERO framework.

### 4.1.2 Norm Activation Model

TPB is a general framework on behaviour. Even if it has been used extensively to study green behaviours, the model has not been built for these specific behaviours. On the contrary, the Norm Activation Model (NAM) (Schwartz 1977) focuses on pro-environmental behaviours and presents them as resulting from personal norms, i.e. feelings of moral obligation to act in a certain way. Four factors are considered to trigger personal norms:

- problem awareness: individuals have stronger personal norms when they are aware of the problems caused by their behaviour.
- ascription of responsibility: individuals have stronger personal norms when they consider they are responsible for the problem or behaviour in question.
- outcome efficacy: personal norms are stronger when individuals believe their behaviour can reduce problems.
- self-efficacy: personal norms are stronger when individuals consider that they can engage in behaviours that will reduce problems. This factor is comparable with PBC in TPB (Steg and Nordlund 2019).

NAM variables have been shown to be causally related: individuals need to be aware of the problem caused by their behaviour before being able to consider their own responsibility in the problem and before considering they can help reducing the problem by changing behaviour (Steg and Nordlund 2019).

### 4.1.3 Value-Belief-Norm theory

The Value-Belief-Norm (VBN) theory of environmentalism (Stern et al. 1999), as NAM, is also a theory meant at explaining pro-environmental behaviours. Unlike NAM, VBN also incorporates values and beliefs and does not limit its explanatory scope to moral-driven actions. Here is a presentation of the three key features around which VBN is structured:

- Values: the theory distinguishes three values, i.e. goals that guide an individual in his life choices:
    - altruistic, when people show their concern for the well-being of others
    - biospheric, when people are concerned by the ecosystem
    - egoistic, when people are trying to increase their personal benefits.

  It has been shown that the two first values are positively related to pro-environmental behaviours while the last shows a negative correlation (Stern et al. 1999).

- Beliefs: they refer to people's worldview about the human-environment relationship:
    - ecological worldview i.e., belief in the human impact on the environment
    - awareness of consequences (AC) i.e., knowing the negative effects of environmental damage
    - ascription of responsibility (AR) i.e., feeling personally responsible for environmental problems

- Personal norms i.e., sense of obligation to take pro-environmental action
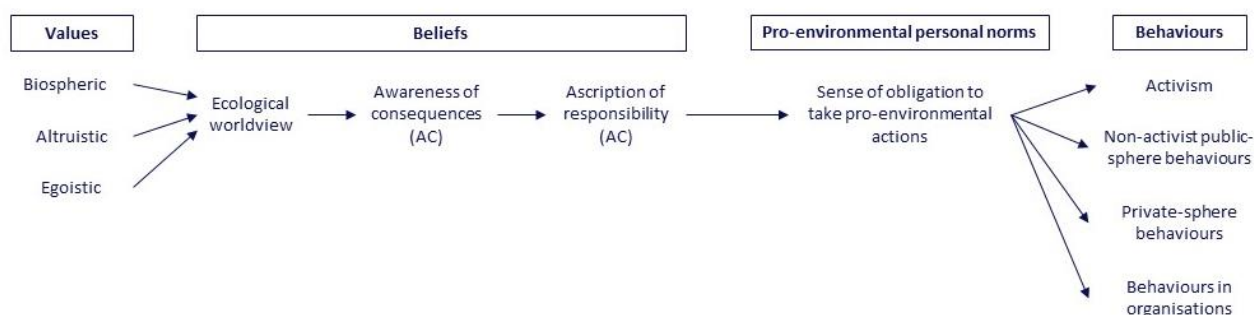


*Figure 2: Value-Belief-Norm theory, adapted from (Stern 2000)*

As shown on Figure 2, the VBN theory has a causal structure, where variables have direct causal relationships between each other (Stern et al. 1999; Steg and Nordlund 2019). For example, AC beliefs can trigger AR beliefs (Tölkes 2020).

### 4.1.4 Integrated Behaviour Model

Although the TPB is validated as predicting much of the variance in certain social behaviours, it is criticized for its assumption that behaviour is influenced exclusively by intention (Ajzen 1985; Gauld, Lewis, and White 2014). The Integrated Behavioural Model (IBM) builds on the TPB by supplementing it with factors other than intention that explain variance in behaviour (Montaño and Kasprzyk 2008).
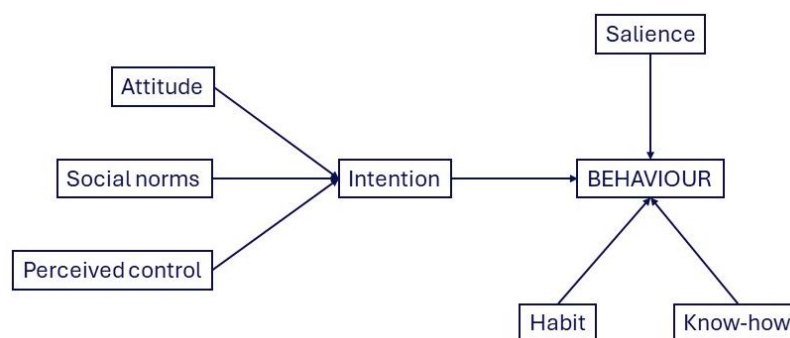
*Figure 3: Integrated Behaviour Model (Montaño and Kasprzyk 2008)*

An advantage of this model is that it accounts for studies showing that habits and having a mental model of how to execute an action (implementation intentions) explain variance in behaviour above and beyond mere intentions. It also accounts for the extent to which people are aware of their own behavioural choices and the consequences they have.

### 4.1.5  Habit theory

Habits can be particularly important predictors of everyday behaviours where individuals usually repeat automatically a behaviour they have shown before to preserve cognitive resources for other tasks. Habits are cognitive structures that automatically link specific contextual cues to specific behavioural patterns (Klöckner and Verplanken 2019; Orbell and Verplanken 2020).

Habits have four key features (Klöckner and Verplanken 2019):

- frequency
- stability of context
- success, meaning that intended goals are reached
- automaticity, meaning that there is no new assessment of the behaviour.

Whereas intention is likely to be a strong predictor when behaviours are performed for the first time, the influence of habits becomes stronger when the same behaviour is repeated in a similar context. The linkage between the behaviour and certain cues becomes stronger. When looking at habits in the environmental domain, they can often be in contradiction to individual's pro-environmental intentions. Deactivating habits can be done following two different methods (Klöckner and Verplanken 2019):

- change or remove cues to change the context
- use implementation intentions, with a concrete plan associating situational cues to the desired behaviour.

For this reason, some habit theorists consider know-how or implementation intentions as a factor that can influence habits (cf. Stage Model, below). Habit theory can also be used as a tool to develop sustained behaviour changes by promoting repeated behaviours in a stable cue context (Orbell and Verplanken 2020).

### 4.1.6  The Stage model of Self-regulated Behavioural Change

The Stage model of Self-regulated Behavioural Change (SSBC) developed by Bamberg (2013b; 2013a) describes the change in behaviour as a process of four stages, where going from one stage to the next implies setting a specific intention:

1. **Pre-decision stage:** the individual should answer to the question: "why is it important/necessary to change behaviour?". The answer sets the goal intention. The goal intention can be formulated when personal norm is strong enough, due to awareness of negative consequences of the persistence of a behaviour, acceptance of a personal responsibility, social

pressure. These variables and mechanisms derived from the Norm Activation Model (Schwartz and Howard 1981)

2. **Pre-action stage:** the question to address is "which action should I take to change behaviour?". In this stage the individual checks their attitude towards different alternatives and the perceived feasibility of each alternative (PBC), where attitudes and PBC are derived from TPB. This stage enables the development of a behavioural intention.
3. **Action stage:** the individual needs to answer the question: "how do I implement the intended changes?" to make plans and remove barriers to formulate an implementation intention.
4. **Post-action stage:** the individual has to stabilise the new behaviour.

According to Bamberg and Schulte (2018) the strength of the SSBC lies in the description of the tasks an individual has to solve to achieve transition to following stages.
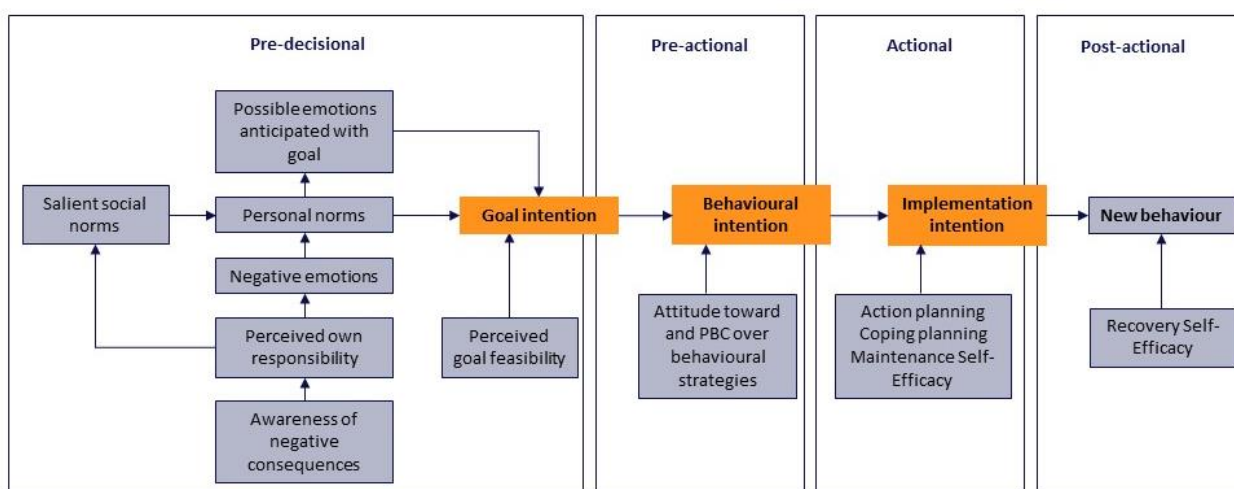


*Figure 4: The Stage model of Self-regulated Behavioural Change, adapted from (Bamberg 2013a)*

### 4.1.7   Strength of predictors

The different theories and models of behaviour change above are not fundamentally incompatible but there are rather differences in what they emphasize. Each model can be expected to vary in its ability to predict different sorts of behaviour, with some models predicting certain types of behaviour better than others. To get an indication of which of the reviewed factors can best predict pro-environmental behaviour, papers conducting meta-analysis on the correlations between psycho-social determinants and pro-environmental behaviour were reviewed.

Bamberg and Möser (2007) conducted a meta-analysis of pro-environmental behaviours based on 57 samples and found a random-effects mean correlation of:

- r=0,52 between pro-environmental behaviour and **intention**
- r=0,42 between pro-environmental behaviour and **attitude**
- r=0,39 between pro-environmental behaviour and **moral norm**
- r=0,31 between pro-environmental behaviour and **social norm**
- r=0,30 between pro-environmental behaviour and **PBC.**

Another meta-analysis focusing on energy saving behaviour and based on 102 independent samples found the following associations (Carrus et al. 2021):

- r=0,533 between energy-saving behaviour and **emotions** (e.g., pride, guilt or anger)
- r=0,482 between energy-saving behaviour and **attitude**
- r=0,311 between energy-saving behaviour and **awareness**
- r=0,300 between energy-saving behaviour and **intention**
- r=0,271 between energy-saving behaviour and **values.**

Although these results are not based on the specific behaviour of online consumers choosing a delivery option, the evidence on these factors as influences of behaviour is well-validated. I**ntention**, **attitudes**, **social and moral norms**, **PBC, values, emotions, and awareness** should therefore be considered in constructing the CodeZERO model of influences on consumer choice, which will inform the evaluation framework.

Pernot, Phillips, and Saghafian (2025) show the importance of **awareness** and **values** in explaining consumers' delivery choice, so these two predictors should be included in the model. **Attitudes** are found determinant by Cauwelier, Lebeau, and Buldeo Rai (2025) and Cauwelier et al. (2025). **Social and moral norms** (extrinsic and extrinsic motivations) should also be considered (Cauwelier, Lebeau, and Buldeo Rai 2025). On the contrary, none of CodeZERO deliverables has identified **emotions** as a predictor of delivery choice, so the framework will not account for them. **PBC** was also shown to be relevant for analysing delivery choice as consumers can encounter physical and cognitive barriers making them to believe it is not possible to engage in the behaviour (Phillips and Pernot 2025). When it comes to **intention**, CodeZERO deliverables also suggest that there is an intention-behaviour gap for some online consumers and ordering situations and consistency between them in other circumstances (Pernot, Phillips, and Saghafian 2025; Phillips and Pernot 2025). The former highlights the need to account for intention in the assessment framework. Indeed, there is increasing evidence that behavioural intention is only one of several factors that explain actual behaviour or choice. Though less work has been done to quantify their strength as predictors of behaviour alongside intention, research increasingly suggests that factors such as **know-how**, **salience**, **implementation intentions** (mentioned in IBM, Stage model and habit theory) should also be accounted for in a framework assessing consumer choice of delivery option. CodeZERO has generated evidence for the relevance of these factors as influences on online consumer choice of delivery option (Phillips and Pernot 2025).

Ouellette and Wood (1998) found a correlation r=0,39 between past and future behaviour with a meta-analysis based on 64 independent studies on everyday-life behaviours. This suggests the potential for **habits** to override intentions. CodeZERO deliverables also show the importance of habits in the choice of delivery option, indicating the need to consider them in the framework (Pernot, Phillips, and Saghafian 2025; Cauwelier, Lebeau, and Buldeo Rai 2025). Other factors that account for the gap between intention and behaviour should be considered, as presented in the next section.

## 4.2  Decision-making model: the Decision Ladder

Although it differs from the above models of consumer behaviour, the Decision Ladder (Vicente 1999) is added here for two reasons. First, it adds explanatory power when assessing factors influencing choices made by online consumers. Second, it can also help explain the gap between intentions to choose sustainably and actual sustainability choices.

The Decision Ladder is concerned with how people decide what needs to be done in specific, event-dependent situations. An example of a Decision Ladder for an online consumer choosing a delivery option is given in Figure 5, in which the questions illustrate recurring concerns of online consumers. The model accounts for the fact that different online ordering situations place distinct cognitive demands on consumers. Or, in decision ladder terms, different parts of the model may be active in different online ordering situations.

In Figure 5 the boxes show mental activities the consumer performs when choosing delivery online. These are called mental activities as they involve perceiving and thinking. The ovals show states of knowledge that result from mental activities. In real-world situations, consumers do not necessarily follow decision ladder steps in order from left to right; they can start or end at any point in the ladder, and shortcuts between mental activities are possible. Figure 5 illustrates this with two examples. First, the green arrow denotes an important shortcut observed in online choice simulations in which consumers choose by envisaging how future events would play out if they selected the option in question and then revise any option failing to satisfy prioritized goals (Phillips and Pernot, 2025). Second, the red arrow denotes a highly routinized delivery choice habit, in which a consumer used to using an online platform chooses the delivery option they normally choose thus minimizing the need for extensive mental processing.
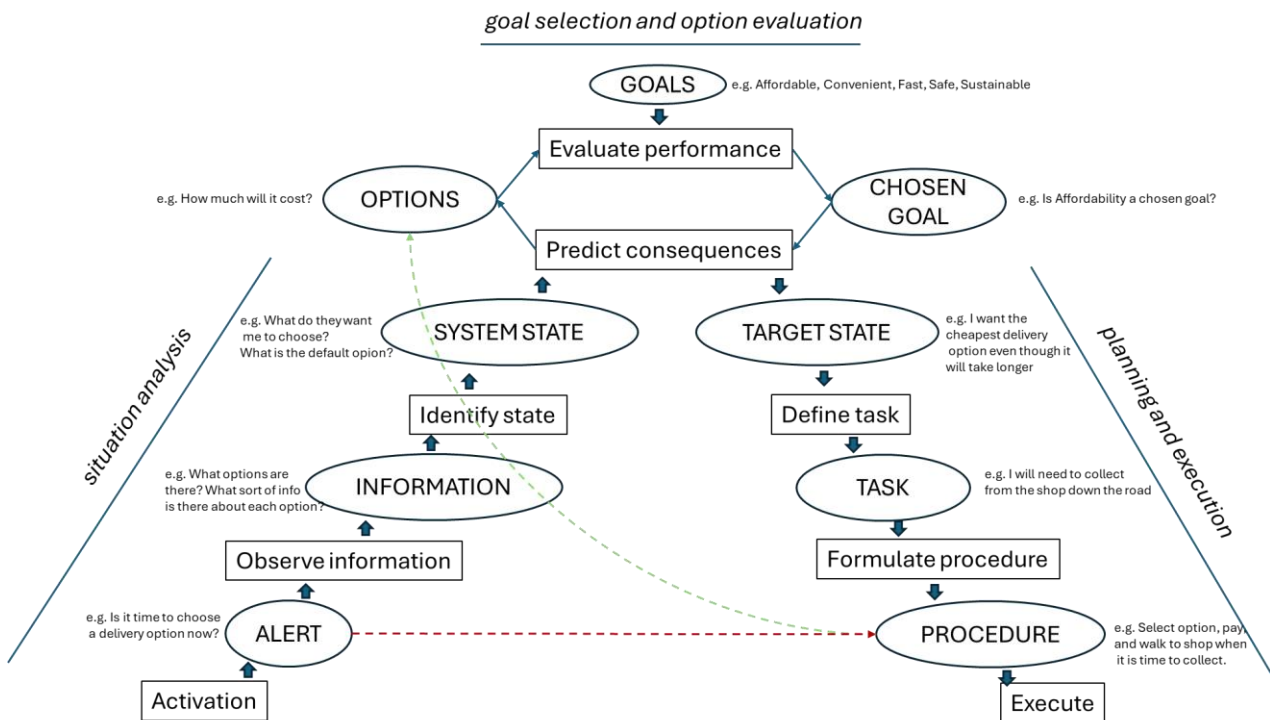
*Figure 5: Hypothetical Decision Ladder for an online consumer performing the function of choosing a delivery option. Adapted from Naikar (2013).*

Although it is not strictly a model of behavioural change, the Decision Ladder complements the above models by accounting for the fact that delivery choice (i.e. behaviour) by consumers depends on how they prioritize other delivery goals alongside sustainability. It also accounts for goal prioritization by the individual consumer as depending on the product(s) being ordered and various situational characteristics such as important deadlines (e.g. birthdays) or ability to collect from a pick-up point on a certain day. CodeZERO observations so far suggest that these factors will be important to consider when accounting for and influencing behaviour (Phillips and Pernot, 2025). If communication measures make consumers aware of a new sustainable delivery option, consumers valuing cost and convenience more than they value sustainability may still not choose it if it is more expensive or less convenient than the other delivery options. The above models do not account for this, but the Decision Ladder does. It also accounts for habits as a factor explaining why intention to choose a sustainable delivery option may not result in actual choice of a sustainable delivery option. We should therefore also consider KPIs that could be derived from the Decision Ladder.

## 4.3  Nudge theory

"Nudging" describes an attempt to influence people's behaviour in a desired direction, without using punishment or economic incentive. Nudging was developed based on the dual system framework (Kahneman and Frederick 2005), which describes how decision-making can be:

- intuitive, automatic and fast (System 1 thinking) or
- rational, analytical and slower (System 2 thinking).

Nudge theorists claim that the basis on which we make poor lifestyle choices is often through the activation of System 1 type processes—it is therefore these processes that communication interventions should influence (Thaler and Sunstein 2008). One way to target System 1 thinking is by addressing the contextual cues or social norms that can trigger more automated thinking. Because of its attempts to influence automated thought processes, nudging can occur without the decision maker's awareness (Lin, Osman, and Ashcroft 2017). More recently, researchers have pointed to lack of agreement on the two-system basis of nudge theory. Alternative accounts have been given in which the two systems are integrated. One of these conceptualizes choices as being processed through a connected network, with

knowledge, belief and other cognitive nodes becoming activated as choices are made (Lin, Osman, and Ashcroft 2017). Decisions are then made based on maximal coherence between weighted network nodes and choice outcomes.

It is still not clear whether choices are made using one of two "thinking systems" or an integrated version of these systems. This is important since it determines whether communication interventions should be designed to account for System 1 or System 2 thinking or both. Even if original nudge theorists are correct, however, it is likely that some consumers will make choices more rationally and some more automatically. CodeZERO work with online consumers supports this (Phillips and Pernot, 2025). A reasonable conclusion, therefore, is that communication interventions, and therefore their evaluation, should account for both sorts of thinking.

## 4.4   Selected behaviour influences for CodeZERO framework

Based on CodeZERO results and on the discussions of theories in the previous sections, the following influences on online consumer choice were selected for construction of the evaluation framework:

- Awareness of the impact or problem awareness (based on NAM, VBN, D2.2, D2.1 and D2.5)
- Values (based on VBN, D2.2)
- Attitudes (based on TPB, D2.1, D2.5)
- Social norms (based on TPB, D2.1, D2.5)
- Personal norms (based on VBN, D2.1)
- PBC (based on TPB, D2.3)
- Intention (based on TPB, D2.2, D2.3)
- Habits (based on IBM, Habit theory, D2.1, D2.3, D2.5, IBM)
- Goals (based on Decision ladder, D2.1, D2.3, D2.5)
- Goal Choice moderators (based on IBM, Decision Ladder, D2.3)
- Know-how (IBM, SSBC, D2.3)
- Information content (based on D2.2, D2.3)
- Trust in information (based on D2.2 and EU Directive on Empowering Consumers for the Green Transition[2])
- Contextual cues and information (based on Nudge theory, Decision Ladder, D2.3)
- Sociodemographics (based on D2.1, D2.3, D2.5)
- Life events (based on D2.2)

Relations between these influences are indicated by the models above, which were considered together when constructing the CodeZERO model of influences on consumer delivery choice that will be presented in Chapter 6. Before that, there is a need to review previous frameworks for the evaluation of sustainable consumer behaviour in general, because it can also usefully inform a model of influences on sustainable delivery choice by e-commerce consumers.

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[2] The need to include trust in messaging in CodeZERO framework is also confirmed by findings that: 53 % of environmental claims made in the EU have been found to be vague or misleading and there are well over 200 environmental labels on the market (Circabc). The EU Directive on Empowering Consumers for the Green Transition, due in 2026, is relevant here as the aim is to ensure that consumers are provided with better information at the point of sale on the durability and reparability of goods and the consumer's legal guarantee rights.

# 5    Existing evaluation frameworks

Existing studies of online consumers' choice of sustainable delivery option and sustainable products are reviewed in previous deliverables from CodeZERO (Pernot, Phillips, and Saghafian 2025; Phillips and Pernot 2025). None of these studies provides a framework to structure either communication interventions to influence online consumer choice of delivery option or the evaluation of those interventions. The following sections therefore present the results of a search for relevant and complementary frameworks for the evaluation of communication interventions aimed at shifting sustainable consumer behaviour (SCB). The results were of two types: i) frameworks for assessing change in SCB; and ii) frameworks for assessing communication interventions. Results of type i) provided new insight specific to the evaluation of change in sustainable consumer behaviour and were therefore used to develop the list of influences the framework should account for. Results of type ii) highlighted the need to also assess the type and effectiveness of communication interventions and their implementation.

## 5.1    Frameworks for evaluating the effect of communication on sustainable consumer behaviour

### 5.1.1    SHIFT framework

Many measurement scales have been developed to assess attempts to influence ecological sustainability behaviour in the population and by consumers (Gilg, Barr, and Ford 2005; Geiger, Fischer, and Schrader 2018). Of these, the SHIFT framework of White et al. (2019) is highly relevant as it is aimed at evaluating attempts by retailers and practitioners to influence consumer sustainability choices. In particular, attempts to convince consumers of the need to choose sustainably and reward them for sustainable choices are seen as ways in which retailers can expand their consumer base, rather than simply appeal to an existing "green" customer segment. Recognizing that existing frameworks inadequately address habits, cognitions and tangibility issues, the authors review "top marketing journals" to develop a complete psychological framework of influences involved in shifting consumer behaviours to be more sustainable (Peattie 2010; Gifford 2014). The frequency with which each influence is mentioned in the literature is taken as a proxy for the size of its effects on sustainable consumer behaviour (SCB). While this is not ideal it is state-of-the-art. The resulting framework can be used to structure and evaluate interventions to shift SCB. Evaluation involves measuring the extent to which an intervention changes critical influences on SCB (as listed Table 2) and the extent to which any changes measured are associated with changes in SCB.

*Table 2: SHIFT framework of key drivers of SCB (White et al., 2019)*

| Driver of behavioural change | Description |
|---|---|
| **Social influences** | Perceptions about what others choose and what others value (social norms see 4.1.1 and 4.1.4). In-group choice is likely to have a stronger influence on individual choice (social identity) and people want in-group to be viewed positively, e.g. in competition with other groups (social desirability). |
| **Habits** | Choices become automatic on encountering contextual cues time and time again—since many habitual choices are unsustainable, it can be critical to address habits. |
| **Individual self** | The extent to which choice lets people maintain a positive view of themselves and be consistent with their values; people must believe they can choose and doing so will lead to desirable effects in the real world (self-efficacy). |

| Driver of behavioural change | Description |
|---|---|
| **Feelings and cognitions** | Two aspects of choice: 1) Affective / instinctive - so consider the role of fear, guilt and positive emotions in influencing choice; and 2) Cognitive / deliberate - knowledge influences sustainability awareness and behaviour dependent on factors such as education level or message simplicity. |
| **Tangibility** | A unique challenge for influencing SCB is that the consumer is asked to put aside short-term gains for themselves in favour of distant, abstract gains for the collective. Messages that recognize this reality can work well e.g. address the world that children will grow up in, point out more proximal impacts of sustainability such as social conditions for workers. |

The SHIFT influences are constructed to give complete coverage of concepts found to influence SCB in diverse studies (White, Habib, and Hardisty 2019). When used as an evaluation framework, SHIFT could also explain any gaps between how consumers feel, think and say they will choose and how they actually choose in the real world (so-called attitude-behaviour gap; Young et al. 2010).

### 5.1.2 COM-B framework

The COM-B framework for understanding the effect of information-based interventions on SCB serves as a useful complement to the SHIFT framework (Ran et al. 2022). The framework, considers that a consumer can make a choice if they have:

- the capability to choose
- the opportunity to choose
- the motivation to choose.

This is explained further in Table 3.

*Table 3: The COM-B framework (Ran et al. 2022)*

| Choice taken if consumer has… | Description |
|---|---|
| **Capability to choose** | Does the individual consumer have the physical and psychological skills and knowledge needed to attend to and execute the sustainability message? |
| **Opportunity to choose** | Do factors external to the individual make choice possible? Includes social influences and factors in the surroundings, such as physical access or information cues. |
| **Motivation to choose** | Does the consumer have the "energy" to direct their choice? This is determined by goals (including feedback and reinforcement of behaviour), context of decision-making (e.g. distractions), self-efficacy, emotions and social identity. |

While there is overlap between influential factors covered by the two frameworks, the COM-B differs from SHIFT in that it:

- Provides an alternative way to group drivers of change in SCB
- Focuses on informational drivers of change
- Provides explicit mechanisms for how information can affect each COM-B component and lead to more comprehensive change in SCB

- Considers the importance of informational influences on SCB in different phases of the consumer journey—before, during and after the choice is made.

Although information can influence consumers while they shop, consumers themselves prefer sustainability information about products not while shopping but before or after it (Ran et al. 2022). Social influences too are likely to influence people before they shop rather than while they are shopping—particularly for the online consumer. Thus COM-B accounts for how information can influence consumers as they plan their shopping, as they execute their shopping, and how they reflect and learn for next time they shop. The COM-B framework is well-suited to account for interventions that account for how contextual factors influence real-world consumer behaviour (Lambe et al. 2020). It suggests the evaluator should consider explicitly how (informational) drivers of SCB are thought to work in different phases of the consumer journey (see 6.1).

### 5.1.3 Summary

SHIFT and COM-B frameworks are nicely confirming the influences already identified in 0. Social influences are already accounted for in social norms, habits are included, and individual self is covered by values. For feelings and cognitions, emotions were excluded from CodeZERO framework (see 4.1.7) but cognitions are accounted for with problem awareness.

Capability to choose is covered in the selected list of influences by PBC and know-how. Opportunity to choose relates to social norms, contextual cues and information as well as goal choice moderators. And motivation to choose is covered by goals, goal choice moderators and values.

The only influence that needs to be added to the list established in 0 is tangibility, as it is not yet covered and seems relevant when evaluating sustainable behaviours.

## 5.2 Frameworks for evaluating communication

In the previous chapters and sections, factors influencing behavioural change were considered when evaluating the mechanism and effect of communication-based interventions on choice of delivery by online consumers. This is known as *outcome* evaluation. In addition, however, practitioners should carry out a *process* evaluation to assess the efficiency of communication, how well the message communicated was delivered and how well it reached and was processed by the target audience. Frameworks that are relevant for process evaluation will be reviewed in this section.

### 5.2.1 Delivery and reach of communication

To assess the efficiency of communication in relation to its effectiveness, it is important to

- describe the strategy and resources used to communicate to consumers
- assess the extent to which the steps of communication were carried out and worked as planned, and
- assess how well the communication reached its target audience by assessing awareness by asking consumers how well they recall the message communicated, both actively and passively.

Presented in Figure 6, the logical framework (logframe[3]; Roduner, Schläppi, and Egli 2008) is appropriate for structuring this analysis. It recommends considering different elements when developing a program intended to change behaviour. It highlights the need to not only consider the effects of the program but also the inputs, the resources used, the activities performed, the outputs, etc. This suggests that the CodeZERO framework needs not only to assess the content and effects of the communication measures but also the *implementation* of the communication measures, in terms of resources used, constraints faced, activities executed and any direct outputs resulting from these activities, e.g. web text added or replaced, number of brochures printed and so on.

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[3] https://ctb.ku.edu/en/table-of-contents/overview/models-for-community-health-and-development/logic-model-development/main
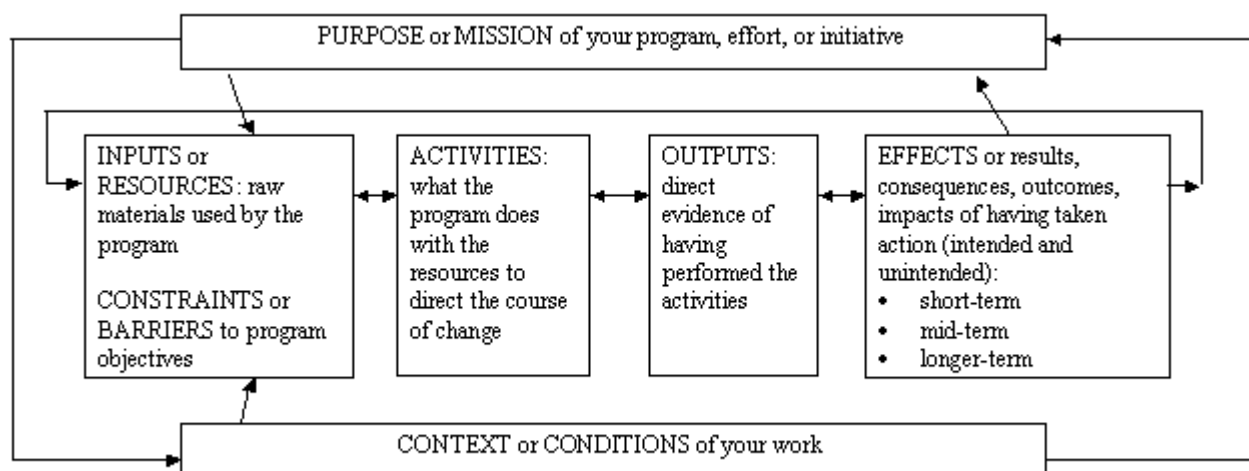
*Figure 6: Logical framework (logframe; (Roduner, Schläppi, and Egli 2008; Milstein and Chapel, n.d.)*

### 5.2.2 Reception of communication

Out of all frameworks available for structuring the evaluation of the reception of communication interventions, the ones described in this section are judged as having the potential to add value to the assessment of CodeZERO communications.

#### 5.2.2.1 *RE-AIM framework*

The RE-AIM framework (Gaglio, Shoup, and Glasgow 2013; Holtrop, Estabrooks, and Gaglio 2021) was published for the first time in 1999. The purpose of the framework was to improve reporting related to implementation of health communication interventions or health initiatives.

The components of the framework (see also Table 4) are the following:

- Reach is aimed at reporting on the individuals who are willing to participate in a given initiative (number, characteristics, etc.).
- Effectiveness is a measure of the outcomes of the intervention (positive and negative effects).
- Adoption is a characterization of the settings and agents (numbers and representativeness) who are willing to initiate a program.
- Implementation refers to the description of the implementation of the intervention and the extent to which it is done according to the protocol.
- Maintenance is a measure of the extent to which a program or policy becomes part of the routine of the organization's practices and policies.

#### 5.2.2.2 *McGuire's Communication/Persuasion model*

McGuire's Communication/Persuasion model (Oyibo and Toyonaga 2024) is a well-established model that instructs the analyst to assess how well the message communicated works along its path from initial presentation to behavioural change in the consumer. It encompasses the following different steps (see also Table 4):

- Presentation: Persuasive message presented to the consumer
- Attention: Receiver pays attention to message
- Comprehension: Consumer understands arguments conveyed
- Yielding: Consumer agrees/sympathizes with message
- Retention: Consumer remembers message
- Behaviour: Consumer chooses in line with message.

Each step along the path gets increasingly difficult, e.g. the message may be presented but not all consumers will attend to it and fewer still will understand it. Evaluation of items in this model informs practitioners about where along its path the message was "lost", with a view to future improvements.

### 5.2.2.3 EAST framework

The EAST framework (see Table 4) has been developed by the Behavioural Insights Team of the UK government to simplify guidance on achieving change in sustainability behaviour (BIT 2014). To construct the model, evidence was collected from an extensive review of behavioural science and distilled into four main factors that make sustainable communications more appealing and to assess when communication is evaluated (BIT, 2014)[4]. Its authors claim that the model has been cited 350 times in the scientific literature since its introduction ten years ago. Two of the main factors in EAST support the importance of Social influence and Tangibility as influences on sustainability behaviour, which other reviewed studies have also found. The other two factors, however, are novel and suggest that it is important to evaluate the Attractiveness and timeliness of the message and the Ease in which it can be followed by consumers to understand its effects on SCB.

### 5.2.2.4 B=MAP or Fogg behaviour model

Like EAST, the B=MAP model[5] (e.g. Shah and Agarwal 2020) is also a relatively recent model that distils much behavioural evidence aiming at simplifying and increasing the power of attempts to change and evaluate SCB. The model claims that behavioural change (B) results from changing the extent to which consumers want to change (Motivation), the extent to which they feel they can change (Ability, akin to PBC) and the construction of Prompts, which refer to how nudging interventions aimed at influencing choice or behaviour are timed in relation to when that choice is made. The model's authors give evidence that it is referred to by over 1200 scientific articles. B=MAP gives novel input to the CodeZERO model by underlining that evaluation should consider how any message or other intervention is timed in relation to when the choice is made. This may be important to consider for influencing and evaluating the effect of interventions on online consumer choice, where messages can often be given when and where the choice is made (Phillips and Pernot, 2025).

### 5.2.2.5 MINDSPACE framework.

Finally, the MINDSPACE model[6] (Hashemi et al. 2024), which structures and evaluates the design of persuasive communications with human decision-making considerations, and which is amenable to human-machine interface communications, adds several unique factors for CodeZERO evaluators to consider. According to MINDSPACE, messages must be highly salient to consumers if they are to influence them, and salience should therefore be evaluated. Consumer perceptions and trust in the communicator or message source can also affect the way it is processed and followed and should be evaluated. Default settings at the time an online choice is made can influence the extent to which any online messages are perceived or followed. The MINDSPACE model suggests the role of priming or nudging when assessing communications should be evaluated, both as part of the communication strategy or something which distracts from it.

*Table 4: Frameworks relevant for assessing communication interventions in CodeZERO, and associated components*

| Model | Component |
|---|---|
| RE-AIM | **R**each: the extent to which the intervention reaches the target population |
| | **E**ffectiveness: the impact of the intervention and outcomes |

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[4] BIT-EAST-handbook.pdf
[5] https://behaviormodel.org/
[6] https://thedecisionlab.com/reference-guide/neuroscience/mindspace-framework

| Model | Component |
|---|---|
| | **A**doption: The uptake of the intervention by settings and staff |
| | **I**mplementation: how well the intervention is delivered as intended |
| | **M**aintenance: how the intervention is sustained over time |
| **Communication/Persuasion** | Presentation: Persuasive message presented |
| | Attention: Receiver pays attention to message |
| | Comprehension: Consumer understands arguments conveyed |
| | Yielding: Consumer agrees/sympathizes with message |
| | Retention: Consumer remembers message |
| | Behaviour: Consumer chooses in line with message |
| **EAST** | **E**ase of choice consumer asked to make, e.g. assisted by nudging or eco-labelling |
| | **A**ttractiveness: Does the message communicated attract the consumer's attention? |
| | **S**ocial influence factors |
| | **T**imeliness of message – is the message available at time of choosing? |
| **B=MAP** | **M**otivation: Is the consumer motivated to choose the option |
| | **A**bility: Can the consumer choose the option given the effort involved and their constraints? |
| | **P**rompt: Effectiveness of timing is the message available at time of choosing (including nudges)? |
| **MINDSPACE** | **M**essenger: Consumer beliefs about who is communicating the message |
| | **I**ncentives: Consumers react in predictable ways to gain or avoid loss |
| | **N**orms: Social influence |
| | **D**efaults: Consumers will tend to go with preset options |
| | **S**alience: Is the message novel, striking and relevant |
| | **P**riming: Subconscious cues can influence consumer choice |
| | **A**ffect: Emotional associations can shape our actions |

| Model | Component |
|---|---|
| | **C**ommitments: Consumers want to behave consistently with values but visibility to others is important |
| | **E**go: Consumers act in ways that make them feel better about themselves |

### 5.2.3 Summary

Together these frameworks cover the reach, properties, and timing of the message, as shown in Table 4. Note that several of the components in these frameworks are addressed as part of the behavioural change evaluation, based on the influences identified in sections 0 and 5.1.3 and need not be considered further here (e.g. social influence, ease of choice, motivation, ability, trust in who is communicating, affect, commitments, ego). Retailers may also be interested in evaluating return-on-investment for communication resources used, but this is outside the scope of this Deliverable.

However, the frameworks presented here highlight the need to account for additional factors in order to assess communication interventions and their implementation process. Therefore, CodeZERO framework will also account for the assessment of:

- Communication strategies: theoretical basis for the interventions (e.g., nudges, labels, information messages), planned content and timeliness of the communication (based on EAST, B-MAP, MINDSPACE)
- Resources used to carry out the communication (based on logframe)
- Activity: communication interventions
- Efficacy in carrying out communication: the extent to which the implementation of interventions happened according to plan (based on RE-AIM)
- Target audience reach: attention, comprehension and retention (based on Communication/Persuasion)
- Outcomes of the communication: this is covered by the factors identified as influencing behaviour (0 and 5.1.3)

## 5.3 Adapting evaluations to specific communications

Frameworks for evaluating the effects of communications on online delivery choice should be reviewed and developed considering the specific communication interventions planned. For example, when planning a nudging intervention, the SHIFT framework will be relevant, as consumers will be influenced via the "Feeling and cognitions" dimension of the framework. SHIFT could also be supplemented, however, by practitioner studies specifically assessing the effect of nudging interventions on SCB, such as the EU NUDGE project. If the dimensions of SHIFT are relevant for planned interventions, other EU projects can also inform practitioners. An example of this is the EU project CHORIZO (chorizoproject.eu) focusing on changing food disposal habits. Another is the 3CO project (3-co.project.eu) looking at concise messaging as an informational influence on sustainable consumption. It is therefore important to describe the communication strategy and to adapt the assessment according to what the strategy is trying to achieve.

# 6 CodeZERO assessment framework for consumers' behaviour change

## 6.1 Scope

CodeZERO framework is aimed to assess communication measures and their implementation, as well as their effect on behavioural change and its mechanisms.

Therefore, the CodeZERO framework is composed of two different models assessing:

- Communication measures and their implementation. The nature, scope, process, outputs and outcomes of the communication should be evaluated at each stage in the consumer journey, according to what was designed in the strategy as optimal points for communication along the consumer journey (e.g. in the physical shop, while shopping browsing products online, while choosing a delivery option, while waiting for the product to be delivered, when receiving a package).
- Behavioural change and mechanism of change. In line with (Geiger, Fischer, and Schrader 2018) the communication guidelines and measures used to evaluate their implementation and impact will address factors that influence consumer choice intentions and actual choices, while the impact of altered choices on ecological and socio-economic aspects of sustainability[7] are addressed in the framework presented in Deliverable 3.1 (Fiorello et al. 2025).

The next section presents a model for assessing the communication measures and their implementation, which has been developed based on the above reviews. Likewise, the model for behaviour change is presented in section 6.3.

## 6.2 CodeZERO model for evaluating communication

The CodeZERO model for evaluating communication is built following the three steps described in section 5.2.1:

- a description of the communication strategy and resources used to communicate to consumers
- an assessment of the implementation process i.e., the extent to which the steps of communication were carried out and worked as planned, and
- an assessment of the efficiency of the communication measures in reaching their audience.

Concepts that need to be addressed in the different steps of the evaluation of the communication measures are based on the review summary presented in 5.2.3. The resulting model, shown in Figure 7, is structured according to the logical framework (see 5.2.1) and is designed to document the nature of the communication measures and how well they are implemented.

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[7] CodeZERO defines a sustainable delivery option as "a way of delivering consumer products that does not harm society in the short or long term--it could be more eco-friendly, offer fairer working conditions, support local businesses, or be safer than conventional delivery methods".
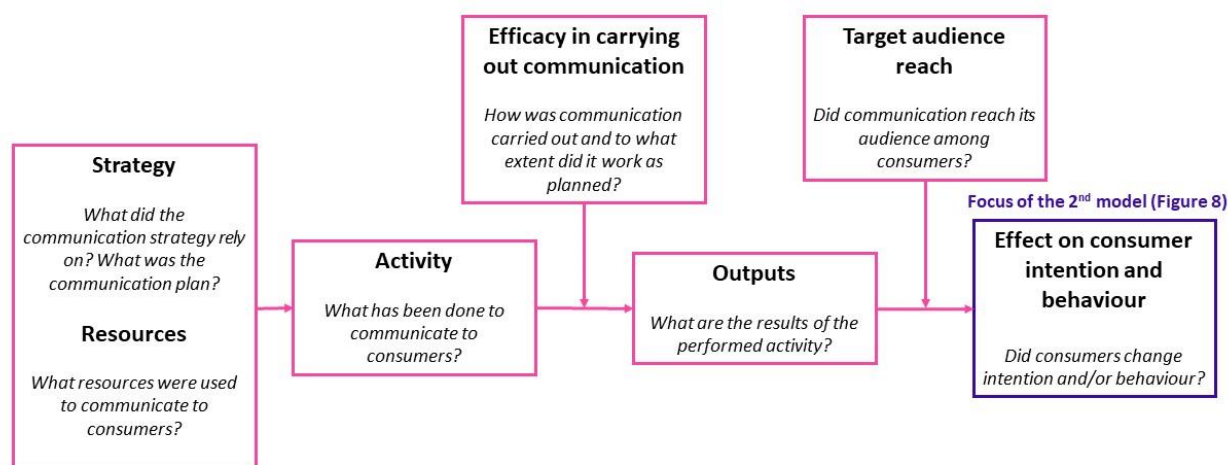
*Figure 7: CodeZERO model of assessment for communication*

Consumer choice of sustainable delivery depends on the outputs of communication activities, which in turn depend on actual communication activities executed. Activities and the effectiveness of their execution depends on the strategy and resources used for communication intervention. Given this, strategy, resources, activities and outputs should be recorded to document the character of the communication intervention so that any effect on consumer choice can be understood and reproduced. The degree to which activities result in intended outputs will depend on how well they are carried out ("Efficacy in carrying out communication") and the extent to which the output of communication activities change consumer choice will depend on how well the message reaches the target audience. Note that Figure 7 shows how the model for evaluating communication relates to the model for evaluating the effect of communication measures on consumer intention and behaviour presented in section 376.3. A further description of components of the CodeZERO model for assessing communication is given below.

### *Strategy and resources*

The design of the communication strategies depends on the elements presented in the behaviour model as it describes factors that influence behaviour and that should be targeted by communication measures, such as awareness, attitudes, social norms, habits, etc. Thus, the guidelines that will be developed in Task 4.3 will be informed by the model presented in 7.3.

To evaluate the communication strategy, a description of the measures planned is needed by answering the questions:

- How should the message be presented?
- How will different communication activities be designed and organised for optimal effect (e.g., nudging or eco-labelling, incentives, social influence, emotional messages)?
- How will the communication messages be planned along different phases of the consumer journey?
- How will they be timed to complement and support each other?
- Will the information be communicated or laid out differently on PC, tablet or mobile phone?

This should include a description of the resources used to communicate to consumers, including human resources, tools and materials used to communicate, budget allocated to fund campaigns as well as time resources and schedules.

### *Activities and efficacy of execution*

This element of the model consists of a description of the different activities performed to implement the communication measures, and an assessment of how well they were executed. Thus, implementation of the communication measures should also be assessed by answering the questions:

- How were the communication measures implemented?

• To what extent were they implemented according to the planned strategy?

*Target audience reach*

The extent to which communication measures reach their audience should be assessed. Based on the review presented in 5.2.2, the elements to consider are:

• Attention -- whether and how well the audience attends to the output message.
• Comprehension – how well the target audience understands the message and its intent.
• Retention – how well the target audience can recall the message.
• Attractiveness of the message – whether the message appealed to the target audience.
• Salience – whether the message was visible or available to the target audience.

For communication measures reaching their audience, the evaluation of their effect on consumers behaviour can be conducted following the model presented in the next section.

## 6.3  CodeZERO model for assessing changes to delivery choice behaviour

The behaviour change model intends to assess changes in the choice of delivery and return options occurring as a result of the communication intervention. It also assesses whether changes in consumer choice behaviour were achieved in accordance with the communication strategy (see 6.2). Evidence that the communication strategy works as intended can be used to support claims that changes in consumer choice were due to the communication intervention.
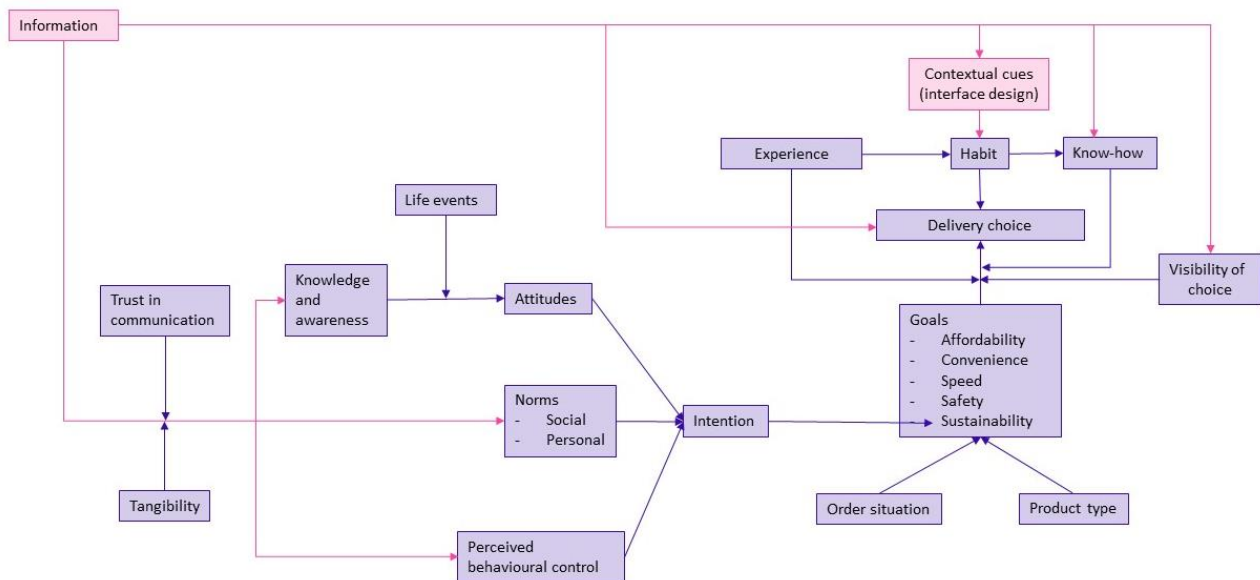


*Figure 8: CodeZERO model for assessing change in delivery choice*

Presented in Figure 8, the model is assessing the effect of communication on behaviour, meaning that, **information**[8] is the input of the model and **delivery choice**, the output. There are two arrows starting from information:

• one starting a path to delivery choice through intentions,
• one accounting for other factors overriding intentions.

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[8] Information is also an output from communication activities assessed in the model presented in Figure 7, which already includes an assessment of the extent to which information reaches the target audience (consumers attend to the message, understand and like it, and so on).

Then, the model is composed by the influences for behaviour identified in 0 and 5.1.3, based on CodeZERO deliverables findings as well as the theories of behavioural change and previous frameworks reviewed.

The first part of the model explains how information can influence behaviour through intention. Depending on the communication strategy, **information** can influence intention through awareness and attitudes, norms or perceived behavioural control. CodeZERO findings, as well as the review of behavioural change models, suggests that consumers need to **trust** the message in order to process it. Thus, for instance, they may not know or be aware of the need to choose sustainable delivery options if they do not trust a message designed to convey this. **Tangibility** was also identified as an important factor (see 5.1.3). Indeed, for consumers to take on board sustainability messages, they need to perceive them as tangible. This means that the consumer must believe that the message addresses concrete sustainability challenges that will impact them or their children, friends etc. now or in the future – or else they will be discarded. In this way, trust in a message and the sender, tangibility of messages communicated, as well as factors comprising consumer reach (6.2), will all influence and moderate the success of messages designed to change behavioural intentions through changing **attitudes**, **social norms** or **perceived behavioural control**. **Sociodemographics**, **values**, **beliefs** are not explicitly mentioned in the model as they influence behaviour through attitudes, social norms and PBC. To fully understand the mechanism by which intentions have been influenced by communications we should therefore assess each of these factors.

Life events occurring in consumers life also have the potential to moderate their attitudes towards delivery choice by either modifying their values or by changing the convenience or opportunity of certain options.

The review of TPB and IBM (see 4.1.1 and 4.1.4), suggests that intention leads to behaviour. In the CodeZERO model, however, **intention** to choose sustainably is one of several **goals** the online consumer needs to consider when selecting delivery option[9]. This is important: it both accounts for findings from CodeZERO on factors influencing delivery choice (Pernot et al., 2025; Phillips and Pernot, 2025) and is supported by the Decision Ladder. Thus, according to the CodeZERO model, the ability of communications to influence consumer trade-offs between valued goals will be central to their impact on delivery choice. An important exception to this relates to communications aiming to influence consumers "subconsciously" such as nudging.

Ranking of goals by the individual consumer will depend on the **product type** they want to have delivered, e.g., they may be more inclined to pay extra or more willing to sacrifice sustainability when choosing to deliver a cumbersome item. Various **order situations**, with their constraints, will also be influential, e.g., the consumer may not be able to pick up from a parcel locker on the day the product will be delivered, and may therefore be forced to down-prioritize sustainability. Note that CodeZERO findings suggest that consumers do not think of more than two or three goals when selecting delivery options (Phillips and Pernot, 2025).

The extent to which delivery choices are made on the basis of prioritized goals will depend on three moderating factors:

- previous **experience** with delivery option, e.g., consumers will be less inclined to choose a delivery option that resembles one they have had problems with in the past
- **know-how**, e.g., consumers will be less inclined to choose parcel lockers if they don't know where they are or how to use them (note: relates to implementation intentions)
- **visibility of choice,** i.e., consumers will be less inclined to choose based on their goals if goal-related information for each delivery option is not clear.

CodeZERO has provided evidence that online consumers often select delivery options based on habit, and the above review shows that this is supported by models of behavioural change and sustainable consumer behaviour. The model therefore includes **habit** as a direct influence on delivery choice, that

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[9] Consumer goals can be affordability, convenience, speed, safety, sustainability.

will not involve goal-based prioritization as the delivery choice is made (although habits will be developed based on prioritizations made in the past). **Contextual cues** are also included as an evaluation component in the CodeZERO model, since they often enable, enforce or disrupt habitual choices. As with any factor in the model, they both inform the design of communication strategy and the extent to which those strategies were successful.

These different elements have been assembled in the model presented in Figure 8. The pink boxes are referring to information (outputs from Figure 7) while purple boxes are representing the elements influencing delivery choice.

## 6.4   Presentation of the overall framework

Based on the above models and explanations, the CodeZERO framework for evaluating communication interventions and consumer delivery choices can be presented. This comprises:

i)      Description of the communication interventions,
ii)     Key Performance Indicators, and
iii)    Evaluation Components.

After presentation, the use of these components is explained and illustrated in Chapter 7.

### 6.4.1   Description of the communication interventions

Based on the model for evaluating communication, the assessment of the communication interventions and consumer delivery choices requires first a description of the communication strategy and measures implemented. This description should cover the elements listed in Table 5.

*Table 5: Components of the description of the communication interventions*

| Dimension addressed | Description of the evaluation content |
|---|---|
| **Strategy and resources** | Description of communications, including customer journey considerations:<br>• communicated delivery attributes<br>• information on sustainability<br>• information on how the delivery option works<br>• contextual cues<br>• communication channel |
| | Theoretical basis for communication strategy |
| | Qualitative and quantitative list of resources used |
| **Activities and efficacy of execution** | Description of the communication activities and their implementation timeline |
| | Qualitative evaluation of communication implementation – what worked well, what didn't. |
| | Objective assessment of how clearly the interface explains what the consumer must do to choose and execute delivery |
| **Outputs** | Objective output i.e. the tangible result of communication activities (e.g. number of brochures printed, screen shots showing the communication interventions, etc.) |

## 6.4.2 Key Performance Indicators

Key Performance Indicators (KPIs) assess the impact of communication interventions, not only on consumers' intention to change delivery choice and their actual delivery choice, but on the extent to which they attend, understand and retain the information communicated; the extent to which they trust the information and perceive it as tangible; and the extent to which it changes their attitude to choosing sustainable delivery, perceived social norms, and perceived ability to carry through sustainable delivery.

Retention, comprehension and attention enable to assess target audience reach, as required by the model presented in Figure 7 and each have a corresponding KPI in the assessment framework (see Table 6).

Although not considered in the previous sections, customer satisfaction with the online check-out is included in the framework with a KPI (see Table 6), as it is important for retailers that this is not reduced by the communication.

Trust, tangibility, awareness, attitudes, social norms, PBC, intention, goals, experience, know-how, visibility of choice and habits are all influencing delivery choice, as explained by the model presented in Figure 8. So KPIs have been developed to assess their evolution after the implementation of communication interventions (see Table 6).

Other KPIs are included to account for consumer behaviour regarding both delivery choice and collection of parcels (see Table 6).

*Table 6: KPIs for CodeZERO assessment framework for communication interventions and consumer delivery choices*

| Dimension addressed | KPI number | KPI | Data source |
|---|---|---|---|
| **Retention of message** | 1 | % consumers[10] who recall the message | Self-reported |
| **Comprehension of message** | 2 | % consumers who understand the message | Self-reported |
| **Attention to message** | 3 | % consumers drawn to [target delivery option] or information as indicated by clicking/hovering patterns | Retailer data |
| **Satisfaction with online check out** | 4 | % consumers satisfied with online check-out | Self-reported |
| **Trust in message** | 5 | % consumers trusting the message | Self-reported |
| **Tangibility of message** | 6 | % consumers believing that the message impacts them | Self-reported |
| **Awareness of sustainable delivery/return choice** | 7 | % consumers aware of the impact of the sustainable delivery option vs. other options | Self-reported |
| **Attitude to target delivery/return option** | 8 | % consumers with favourable attitude towards [target delivery option] | Self-reported |
| | 9 | % consumers who believe choosing the new delivery option will have an impact | Self-reported |

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[10] If a sub-group of consumers are targeted (e.g. 18-30 years old), changes in attributes for the targeted groups should be compared with changes in non-targeted consumers. This applies also to the rest of the table.

| Dimension addressed | KPI number | KPI | Data source |
|---|---|---|---|
| Social norms (beliefs about what others choose) | 10 | % consumer population consumers think choose [target delivery option] | Self-reported |
| | 11 | % consumers who believe that most others will choose [target delivery option] | Self-reported |
| Perceived difficulty of implementation of the delivery option | 12 | % consumers thinking it would be difficult to implement the target delivery option | Self-reported |
| Intention to choose target delivery option next time | 13 | % consumers who intend to choose [target delivery option] for next purchase | Self-reported |
| Intention to choose target delivery option online | 14 | % consumers who say an online message made them want to choose the [target delivery option] | Self-reported |
| Ranking of sustainability among other goals | 15 | Average ranking of sustainability as goal influencing choice of delivery option, relative to cost, convenience, speed and safety | Self-reported |
| | 16 | % consumers preferring [target delivery option] last time | Self-reported |
| Experienced satisfaction with delivery option chose | 17 | % consumers satisfied with delivery-collection experience (post-order) | Self-reported |
| Know-how to choose and collect | 18 | % consumers who knew how to collect using the [target delivery option]? | Self-reported |
| | 19 | % consumers who perceive and understand what they must do to choose and execute different delivery options | Self-reported |
| Visibility of choice between options | 20 | % consumers saying they could easily find information needed to assess each delivery option in relation to prioritized goals | Self-reported |
| | 21 | % of consumers who consider that attempts to influence consumers (marketing strategies, nudging) reduces the clarity of delivery choice | Self-reported |
| Degree to which choice is habit | 22 | % consumers who last time say they chose their routine option out of habit for specific retailer/ product category? | Self-reported |
| Delivery choice | 23 | Total number of deliveries | Retailer data |

| Dimension addressed | KPI number | KPI | Data source |
|---|---|---|---|
| | 24 | % deliveries by each delivery option[11] | Retailer data |
| | 25 | % consumers who chose the [target delivery option] for the last order | Self-reported |
| **Collection parameters** | 26 | Average number of kilometres travelled by consumers | Self-reported |
| | 27 | % consumers using private car (by fuel type) for collecting their parcel | Self-reported |
| | 28 | % of consumers trip-chaining for parcel pickup | Self-reported |

### 6.4.3 Additional Evaluation Components

KPIs are factors used to assess the **impact** of communication interventions on delivery choice, intention and other influencing factors, which are presented in 6.4.2. To complete the assessment, it is necessary to consider additional evaluation elements that will allow for a discussion of the KPIs. Evaluation components are factors that can be assessed to:

- characterise the communication interventions,
- understand the mechanism by which any change in delivery choice by consumers has been achieved.

If the mechanism of behavioural change aligns with the hypothesised route for the communication used, it can be taken as evidence that the communication worked as expected and is therefore effective. Evaluation components are shown in Table 7.

The dimensions addressed by evaluation components are all identified in the models presented in Figure 7 and Figure 8.

*Table 7: Evaluation components for CodeZERO assessment framework for communication interventions and consumer delivery choices*

| Dimension addressed | Evaluation Component description |
|---|---|
| **Target audience reach** | Consumer behavioural analytics (clickstream data, mouse tracking data, dwell time) |
| **Information and contextual cues** | Perception of information, cues and symbols by consumers<br>○ How clearly does interface make clear delivery option attributes [product dimensions/ price of delivery/ speed, timing and precision of delivery option/ delivery location/carrier/sustainability]?<br>○ To what extent does consumer perceive and understand key delivery attributes [product dimensions/ price of delivery/ speed, timing and precision of delivery option/ delivery location/carrier/sustainability]?<br><br>Contextual cues as habit triggers<br>○ To what extent do cues on the interface trigger automatic delivery choices?<br>○ What are those cues? |

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[11] The definition of a delivery option should be discussed together with retailers when using the assessment framework.

| Dimension addressed | Evaluation Component description |
|---|---|
| **Knowledge and awareness of delivery option** | Consumer knowledge of how different delivery options affect society and environment |
| **Life events** | Occurrence of a recent life event (e.g., birth of a child, house move, change of working situation) that made consumers change attitude towards [target delivery option] |
| **PBC** | Extent to which consumers feel that can choose [target delivery option] given their constraints |
| **Pre-choice delivery experience** | Average rating by consumers of delivery experience (before last order) of choosing target vs. baseline options (negative-positive) (e.g. punctuality, delivery to correct location) |
| **Determinants of habit** | Characterisation of consumer habits:<br>o number and frequency of orders made online from specific online platform in the preceding 12 months<br>o degree to which consumers are used to choosing different delivery options |
| **Product type ordered** | Characteristics of product ordered last time online delivery chosen<br>o product category<br>o size<br>o weight<br>o fragile?<br>o perishable? |
| **Characteristics of ordering situation** | Situational constraints for the last online order<br>o time constraints<br>o constraints on place of delivery<br>o budgetary constraints |
| **Extra delivery choice parameters** | Device used for the last order (e.g., mobile, tablet, computer) |
| **Collection parameters** | Description of collection journey the last time consumer ordered online:<br>o starting and locations<br>o stops during the journey<br>o location of the collection<br>o time of the collection<br>o transport means used and reasons for choosing transport means |
| **Consumer sociodemographics** | Consumer sociodemographic<br>o age<br>o gender<br>o education<br>o household type<br>o type of residence<br>o geographic location of residence<br>o transport options and behaviours<br>o home proximity to shops |
| **Consumer values** | Consumers' values<br>o pro-environmental values – how important are environmental issues for consumers?<br>o pro-social values – how important is the well-being of others for consumers?<br>o egoistic values – how important is it for consumers to increase their personal benefits? |

# 7 How to use the assessment framework

This section discusses how evaluation should be designed by selecting from the frameworks assessing communications and changes to delivery choice behaviour. It also addresses how different communications can be evaluated alongside each other.

## 7.1 General things to consider - best practices

### 7.1.1 Evaluation purpose

According to Matthews and Simpson (2020) a framework should answer the question: how will the implemented communication measures work, for whom, under what circumstances, and why? At the outset, therefore, it is important to consider what evaluation using the framework should achieve. In this Deliverable a framework is presented for evaluating whether the communication intervention worked (outcome evaluation) and whether it worked as intended (evaluation of mechanism of effect). For example, if a communication is meant to increase choice of a sustainable delivery by creating favourable consumer attitudes to sustainability, then it may be important to measure:

i) change in share of delivery options consumers choose and recall (*outcome evaluation*); and
ii) understanding, awareness of the information communicated and change in intention to choose sustainable delivery (*evaluation of mechanism of effect*).

Interventions might also be informed by a process evaluation, to assesses the extent to which a communication intervention was implemented successfully or an economic evaluation to assess the cost-effectiveness and efficiency of the campaign (Delhomme et al. 2009).

With an idea of the type of evaluation to be performed, specific primary and secondary outcomes for the evaluation can be defined. Primary aims are often linked to ultimate outcomes the intervention team wants to achieve, e.g. "10 per cent more consumers choosing a sustainable delivery option". Secondary outcomes are often linked to the mechanism by which outcomes are achieved but are also desirable outcomes. An example of this is more favourable consumer attitudes to sustainable choice. Suitable outcomes for evaluation can be selected from the tables listing KPIs and evaluation components.

### 7.1.2 Experimental design

True experiments require assigning a representative and random sample of consumers of appropriate size to i) a treatment group to be exposed to the communication intervention, and ii) a control group, which is not exposed to the intervention (Campbell and Stanley 1963). In pilot demonstrations, true experiments are rarely possible. A possible exception to this is A-B testing, in which different consumers are selected randomly for different delivery choice information. If this is not feasible, the following approaches can give the analyst confidence that the communication intervention has worked as intended:

*Comparison group:* The communication may be targeted at a subset of consumers based on geographical location, age, gender or other characteristics. Even though consumers not belonging to the target groups might be exposed to the message, the effect of the message can be expected to be lower in non-targeted consumers. In such cases the effect of the intervention on sustainable delivery choices by targeted consumers can be compared to effects in the comparison group to support that the intervention worked as intended and has caused the effects observed.

*Time series:* If consumer choice of delivery options is tracked over time, one would expect to see a change in choice behaviour that aligns with the timing of the communication intervention, from before to during and after the intervention. Here it would be important to document the hypothesised effects of communication on consumer choice over time, before the evaluation commences. This approach can be valuable where it is difficult to identify a comparison group.

*Mechanism of effect:* As already covered, if hypothesized changes in evaluation components align with changes in actual consumer choice of delivery option, then this can be taken as evidence that the communication intervention has worked as intended.

### 7.1.3 Data collection methods and tools

With the aims of the evaluation and specific outputs and outcomes defined, the analyst(s) can consider how each output and outcome should be measured. Some general examples are given in the KPI table, above.

Subjective measures / self-reported KPIs can be collected by surveying consumers before, during and after the intervention. Surveys can be posted online by the retailer or sent by email, e.g. to registered customers. More in-depth data can also be collected from consumers through interview, focus groups or open survey questions. This can help understand the mechanism of effect of the communication or elucidate the reasons for any challenges that came up.

Objective data can include concrete communication outputs and retailer records of share of delivery options consumers choose for different product types over time (relative to the timing of communication intervention). More specialized objective data can also be collected with selected samples of consumers to capture click-flows, the length of time the cursor hovers over new information presented on the website, or even eye-tracking to record changes in attention consumers give to different elements of the presented delivery choice.

A combination of objective and subjective methods for capturing the same measure is often most effective but also resource intensive.

### 7.1.4 Sample and effect size

Where it is not possible to measure outcomes for all consumers in the targeted or comparison groups, it may be important to know the minimum number of consumers needed to measure the effect of the communication intervention with a level of statistical certainty. This can be achieved using power calculations (Murphy and Myors 2023). Sample size will depend on the effect size that stakeholders expect. The size of change the intervention stimulates (effect size) in relation to stakeholder expectations is also important to account for (Sanson-Fisher et al. 2014).

## 7.2 Examples of application

Based on two examples, this section illustrates how the framework should be used.

### 7.2.1 First example: assessment of communication measures and behaviour change when communicating about the lower impact of pickup points on sustainability

A book retailer would like to encourage consumers to choose the delivery in pickup points rather than home delivery. The retailer is based in France and already offers deliveries in pickup points through its carrier, who has a dense network of pickup points in various shops.

#### 7.2.1.1 Description of the communication interventions

**Strategy and resources**

The retailer wants to increase consumers' awareness about the lower impacts of pickup points deliveries, compared to home deliveries. They would like to try and test two different communication interventions:

- an information message about the pickup points when choosing delivery option,
- a green label for the deliveries in pickup points.

The information message is: "By choosing delivery to a pickup point, you help us deliver more sustainably by reducing delivery vehicles' travel distances, resulting in fewer emissions." It will be visible on the retailer's website and mobile app, when consumers are supposed to choose between the two delivery options.

The green label is a green leaf, assorted with the mention "Eco-Friendly Pickup".

When selecting pickup points, consumers get a map where they can visualize the locations of the pickup points. By clicking on them, they get the name of the pickup point and the opening hours. Information about the delivery date and carrier name are also provided.

The retailer wants to keep the same price policy: pickup points and home deliveries cost the same.

Resources used involved a sustainability expert to craft a clear and trustful informational message, and a web developer to insert and test the new message on the checkout page.

*Activities and efficacy of execution*

The sustainability expert and web developer comprised a design team, who meet to draft alterations to the consumer interface and develop and get management approval for the message and green label used. Any activities to communicate or disseminate the changes among staff or consumers could also be included here.

The message increasing consumer awareness was implemented on the website for consumers with delivery address in Île-de-France from February 1st to February 28th. The green label was then implemented for the same targeted consumers from March 1st to March 31st. And then both the message and the label were made visible for these consumers from April 1st to April 30th.

The implementation of the measures worked as planned, except that the information message had to be shortened on the mobile app.

*Outputs*

In this case the outputs can be illustrated by screenshots showing the concrete digital changes made to the mobile or pc consumer interface. If the message and label were supported by posters or brochures in the retailer's physical store, for example, these would also have been outputs.

### 7.2.1.2 Experimental design

The retailer already offers deliveries to pickup points across the country. The intention with the communication interventions is to pilot them in a specific region (Île-de-France) to see whether the "information message" or "green label" measures have the more impact on consumer behaviour. The consumers outside Île-de-France constitute the control group and will not see the message and label. The two interventions were tested one by one and together to compare the effects.

The evaluation relies on a survey sent to each consumer ordering a delivery in île-de-France after the implementation of the interventions, as well as a selection of consumers outside île-de-France to constitute the control group. Based on the date of their order, it is known which intervention consumers were exposed to, enabling the comparison of:

    A. control group
    B. consumers who only were exposed to the information message
    C. consumers who only were exposed to the green label
    D. consumers who were exposed to the information message and the green label.

### 7.2.1.3 KPIs

Based on the communication strategy, those KPIs most relevant to assess the interventions and their effect were selected from Table 6. The KPIs chosen are listed in Table 8.

*Table 8: KPIs list with associated data for 1st example*

| KPI number | KPI | Data source | KPIs values for the different groups of consumers | | | | Dimension addressed |
|---|---|---|---|---|---|---|---|
| | | | A | B | C | D | |
| 1 | % consumers who recall the message | Self-reported | 5% | 62% | 47% | 70% | Retention |
| 2 | % consumers who understand the message | Self-reported | 5% | 59% | 35% | 59% | Comprehension |

| KPI number | KPI | Data source | KPIs values for the different groups of consumers | | | | Dimension addressed |
|---|---|---|---|---|---|---|---|
| | | | A | B | C | D | |
| 4 | % consumers satisfied with online check-out | Self-reported | 87% | 87% | 80% | 80% | Satisfaction with online check out |
| 5 | % consumers trusting the message | Self-reported | / | 54% | 33% | 57% | Trust |
| 6 | % consumers believing that the message impacts them | Self-reported | / | 47% | 36% | 48% | Tangibility |
| 7 | % consumers aware of the impact of the pickup points delivery vs. home delivery | Self-reported | 35% | 48% | 37% | 50% | Awareness of the sustainable delivery/return choice |
| 8 | % consumers with favourable attitude towards pickup points | Self-reported | 65% | 76% | 68% | 81% | Attitudes |
| 15 | Average ranking of sustainability as goal influencing choice of delivery option, relative to cost, convenience, speed and safety | Self-reported | 4/5 | 3/5 | 4/5 | 3/5 | Goals |
| 23 | % deliveries in pickup points | Retailer data | 35% | 56% | 45% | 59% | Delivery choice |
| 24 | % consumers who chose the pickup points for the last order | Self-reported | 38% | 59% | 43% | 60% | |
| 25 | Average number of kilometres travelled by consumers | Self-reported | 2,1 | 2,7 | 2,1 | 2,8 | Collection |
| 26 | % consumers using private combustion engine car for collecting their parcel | Self-reported | 46% | 48% | 47% | 46% | |
| 27 | % of consumers trip-chaining for parcel pickup | Self-reported | 74% | 75% | 73% | 76% | |

### 7.2.1.4   Assessment summary

The KPIs should be discussed and read in the light of the evaluation components.

KPIs 1 and 2 show that the green label catches less consumer attention than when combined with the information message or when the information message is used alone. The information message also appeared to be easier for consumers to understand than the label. These KPIs should be analysed by considering the device used for the last order, as the information message ended up being different in the app. Based on KPI 4, the information message does not affect consumers' satisfaction while the

label does not impair it significantly. When it comes to trust (KPI 5) and tangibility (KPI 6), results are mixed. It would be interesting to have a more detailed analysis looking at consumers' values and sociodemographic to maybe refine the message and adapt the label. KPI 7 indicates that the message increase consumers' awareness, when the green label does not really have any substantial effect. The same goes with attitudes towards pickup points (KPI 8), which are improved significantly by the information message. These higher awareness and more positive attitudes seem to have an impact on how consumers rank sustainability relatively to other goals (KPI 15). This is an important result.

In terms of behaviour, KPIs 23 and 24 show higher shares of pickup points deliveries both based on objective and subjective data. Since the control group is composed of consumers choosing deliveries outside île-de-France, it also includes rural areas with potentially fewer pickup points opportunities, so this should also be examined by looking at:

- Consumers' geographic location of residence
- Their transport options and behaviours
- Home proximity to pick up points

Distance travelled by consumers is extended due to the higher share of pickup points, and almost half consumers used a combustion engine private car to collect their parcel, which does not vary in the different consumer groups. This can be explained by the fact that communication interventions did not include guidelines on how to travel to the pickup points. This could be included in the future measures.

### 7.2.2 Second example: assessment of communication measures and change in return behaviour

An online fashion retailer would like to reduce the amount of returns they receive and works on a communication strategy to change consumers' behaviour in that matter.

#### 7.2.2.1 Description of the communication interventions

##### Strategy and resources

Internal figures have shown that a high share of returns comes from frequent shoppers. So the communication strategy is targeted at breaking return habits among these consumers. In addition, the communication measures will also increase awareness on the impact of returns to alter consumers' attitudes.

The communication strategy will involve:

- changing contextual cues during the order,
- changing the return experience,
- increasing consumers awareness.

The retailer will not promote "free returns" anymore and will add guidelines to help consumers selecting clothes size. When consumers attempt to purchase two sizes of the same product, a message will appear asking consumers "Are you sure you need two sizes? See our advice to select a size and help us to reduce returns". Instead of providing a return label, in the parcels they deliver the retailer will include a brochure explaining how returns impact society.

When wanting to return a purchase, consumers will have to make a request on the retailer's website, explaining the reason for returning. Depending on the reasons, the retailer will offer an alternative. For example, if a t-shirt has a small defect, the consumer will be offered a partial refund to avoid the return.

Here it is useful to refer to Figure 8 to understand which information consumers will receive and how it might affect their return behaviour (mechanism of effect). This will in turn inform what retailer should measure to understand the effect of the information.

Sustainability information included in delivery parcels attempts to influence consumer's knowledge and awareness of sustainability impact of returning items. This in turn might influence their intention to return items. In this way sustainable delivery as a goal (in this case not returning an item) is increased relative to convenience of returning items from home (see Figure 8 "Goals").

Information is also provided in the intervention that is directly about the return choice (cf. "Delivery choice" in Figure 8). Consumers wishing to make online purchases stop receiving information about free returns and instead receive information about avoiding returns if they select two sizes of the same product. This form of information increases the visibility of choice available to online consumers.

Consumers who wish to return a delivered item will stop receiving a return label in the delivered parcel. Return labels can be considered as contextual cues (cf. Figure 8) and the information in this case is removal of cues that may remind consumers of the possibility of easy return processes.

Finally, if consumers contact the retailer to return a defective product, they receive information on how they can get a partial refund. This can be considered to an attempt at increasing positive attitude to not returning items and lowering return intentions, which is akin to increasing sustainable delivery intentions.

No information is provided on social norms.

Resources used involved human resource time used develop the above changes – including web development, the cost of partial refunds and publishing packaging brochures.

*Activities and efficacy of execution*

The retailer stopped promoting "free returns" on March 1st.

Guidelines on sizes and the message "Are you sure you need two sizes? See our advice to select a size and help us to reduce returns" were added on March 8th.

The return label absence and the changes in the request for returns procedure were implemented on March 15th.

The brochure on returns impacts was designed, published and included in delivered packages from March 22nd.

The implementation of the measures worked as planned, except for the brochures that should have been added on March 15th. The time needed for the printer to print out and send the brochures was not well anticipated.

*Outputs*

Changes to consumer interface, 5,000 brochures were printed, organizational process for partially refunding deliveries reported as defective.

### 7.2.2.2    Experimental design to measure change in consumer choice

The retailer cannot adapt the website to geographical areas, so changes made on the website will be visible for every consumer. One possibility here is to use a time series design to assess the communication intervention. A baseline could be established by surveying consumers in January and February, at different timepoints before the communication measures are implemented in March. Ideally, data from the previous year for the same period would be available to account for any seasonal variation in consumer patterns.

For this retailer, however, time series data was not available and could not be collected. Therefore, a single measure of effect on consumer return behaviour was made in the first two weeks of March, before the intervention, and evaluation components and KPIs were selected with a view to measuring the mechanism of effect of the intervention as evidence of its causality.

### 7.2.2.3    KPIs

Based on an understanding of the mechanism of effect of information communicated, KPIs can be selected to track changes in the following measures from before to after the intervention:

- Recall and comprehension of information by frequent shoppers
- Priority of sustainable delivery (in this case, by avoiding returns) relative to convenience of returning items ordered online from home
- Visibility of sustainability effects when choosing to select two items of same size
- Knowledge and awareness of the effect of returns on sustainability

- Return behaviour

The KPIs value (see Table 9) are informing about the effectiveness of the campaign. A striking increase in message recall and understanding suggests that the intervention was highly effective in catching consumer attention and giving an accessible messaging. This is a strong indicator that the communication design succeeded in reaching its audience. The more moderate but still significant rise in awareness (KPI 7) reflects a growing recognition of the environmental implications of return choices. This suggests that the message didn't just land but also conveyed meaningful content about sustainability. The improved ranking of sustainability as a goal (KPI 15) implies that it became more important relatively to other factors like cost or convenience.

In terms of visibility, a moderate improvement of KPI 20 suggests some success in helping consumers make informed comparisons aligned with their personal goals. However, nearly half still struggle, pointing to room for improving interface. A slight increase in negative perception implies that some consumers may view persuasive strategies as potentially manipulative or confusing. KPI 5, measuring trust, could have been added to better understand how the message was perceived by consumers.

When it comes to behaviour, a notable reduction in return rates (KPI 23) is a strong indicator of change. An important drop in orders with same item in two sizes (KPI 23bis), suggests that the information message was impactful. Self-reported data (KPI 24) supports the trend in retailer data. Together, they reinforce the conclusion that the communication intervention had a measurable effect on behaviour, not just attitudes.

It may also be important to track data on consumers (sociodemographics) and product type in order to understand how the intervention has worked.

*Table 9: KPIs list with associated data for 2nd example*

| KPI number | KPI | Data source | KPIs values for the different groups of consumers | | Dimension addressed |
|---|---|---|---|---|---|
| | | | Before the intervention | After the intervention | |
| 1 | % consumers who recall the message | Self-reported | 3% | 76% | Retention |
| 2 | % consumers who understand the message | Self-reported | 3% | 69% | Comprehension |
| 7 | % consumers aware of the impact of the sustainable return option vs. other options | Self-reported | 40% | 65% | Awareness of the sustainable return choice |
| 15 | Average ranking of sustainability as goal influencing choice of return, relative to cost, convenience, speed and safety | Self-reported | 4/5 | 2/5 | Goals |
| 20 | % consumers saying they could easily find information needed to assess return in relation to prioritized goals | Self-reported | 38% | 52% | Visibility of choice |
| 21 | % of consumers who consider that attempts to influence consumers (marketing strategies, | Self-reported | 21% | 23% | |

| KPI number | KPI | Data source | KPIs values for the different groups of consumers | | Dimension addressed |
|---|---|---|---|---|---|
| | | | **Before the intervention** | **After the intervention** | |
| | nudging) reduces the clarity of return options | | | | |
| 23 | % returns | Retailer data | 45% | 32% | Return choice |
| 23bis | % orders with same item in different sizes | Retailer data | 37% | 15% | |
| 24 | % consumers who chose to return (part of) the last order | Self-reported | 41% | 25% | |

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# 8 Conclusions

This deliverable presents CodeZERO framework for assessing communication interventions and consumer delivery choices. Building on the findings from CodeZERO, and more specifically on insights from WP2 regarding online consumers' choice of delivery options, on behaviour change and decision-making theories (e.g., the Theory of Planned Behaviour, the Norm Activation Model, and the Decision Ladder) and on previous relevant assessment frameworks, two complementary models were developed:

- a model for evaluating communication strategies,
- a model for assessing changes in delivery choice behaviour among consumers.

These models form the basis for the assessment framework, which consists of three interconnected parts:

1. Description of the communication interventions: capturing the nature, format, and outputs of the campaign activities.
2. Key Performance Indicators (KPIs): defining measurable criteria for evaluating the effectiveness of the communication in influencing consumer choices.
3. Additional Evaluation Components: offering qualitative and contextual elements critical for interpreting and discussing KPIs, including factors such as consumer habits, values, and context of the online order.

It is important to note that the framework is intended to be dynamic and adaptable: while it provides a structured foundation, it should be refined and tailored to align with the specific objectives, target audiences, and strategies of individual campaigns. Two examples of application are provided, showing how the framework can be used to assess different communication strategies to influence delivery and return choices.

The framework is designed not only for evaluating the pilots conducted within the project but also with the broader ambition of serving as a general tool adaptable to other communication campaigns targeted at online consumers.

Further, the two models will play a critical role in informing the communication guidelines to be developed in CodeZERO (upcoming Deliverable 4.3), ensuring that future communication strategies are both evidence-based and adaptable to the different contexts of online retailers.

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