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UNLOCKING GREEN DELIVERY: WHAT'S DRIVING THE PREFERENCES OF ONLINE CONSUMERS?

Kathleen Cauwelier – Vrije Universiteit Brussel – CodeZERO


Sanne Wolf - Rijksuniversiteit Groningen – GreenTurn

Anne-Charlotte Trapp - Eurocities – CodeZERO

Bartosz Kożuch – Łukasiewicz-Poznań Institute of Technology – GreenTurn



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A 3D illustration of a brown cardboard box on the left, with a small black square icon containing a white symbol. To the right of the box are two large, stylized circular arrows, one dark green and one light green, forming a loop.

Enabling stakeholder-centric zero emission e-commerce delivery and return practices through transparent and collaborative supply chains

www.green-turn.eu

Basic information

HORIZON-CL5-2023-D6-01-06:

Zero-emission e-commerce and freight delivery and return choices by retailers, consumers and local authorities

GRANT AMOUNT:

2 999 067.50 €

DURATION:

36 Months

(August 2024 – July 2027)

GreenTurn aims to co-create zero-emission logistics solutions, provide sound and transparent information on e-commerce footprints, and enable more sustainable delivery and return choices.

Basic information

Łukasiewicz – Poznański Instytut Technologiczny (Coordinator)

University of Groningen (NL)

Chalmers University of Technology (SE)

University of Antwerp (BE)

University of the Aegean (GR)

Bax Innovation Consulting SL (ES)

Econsult Betriebsberatungsgesellschaft MBH (AT)

Alliance For Logistics Innovation Through Collaboration
In Europe (BE)

Logpoint Logistics Services GMBH (AT)

Logika (GR)

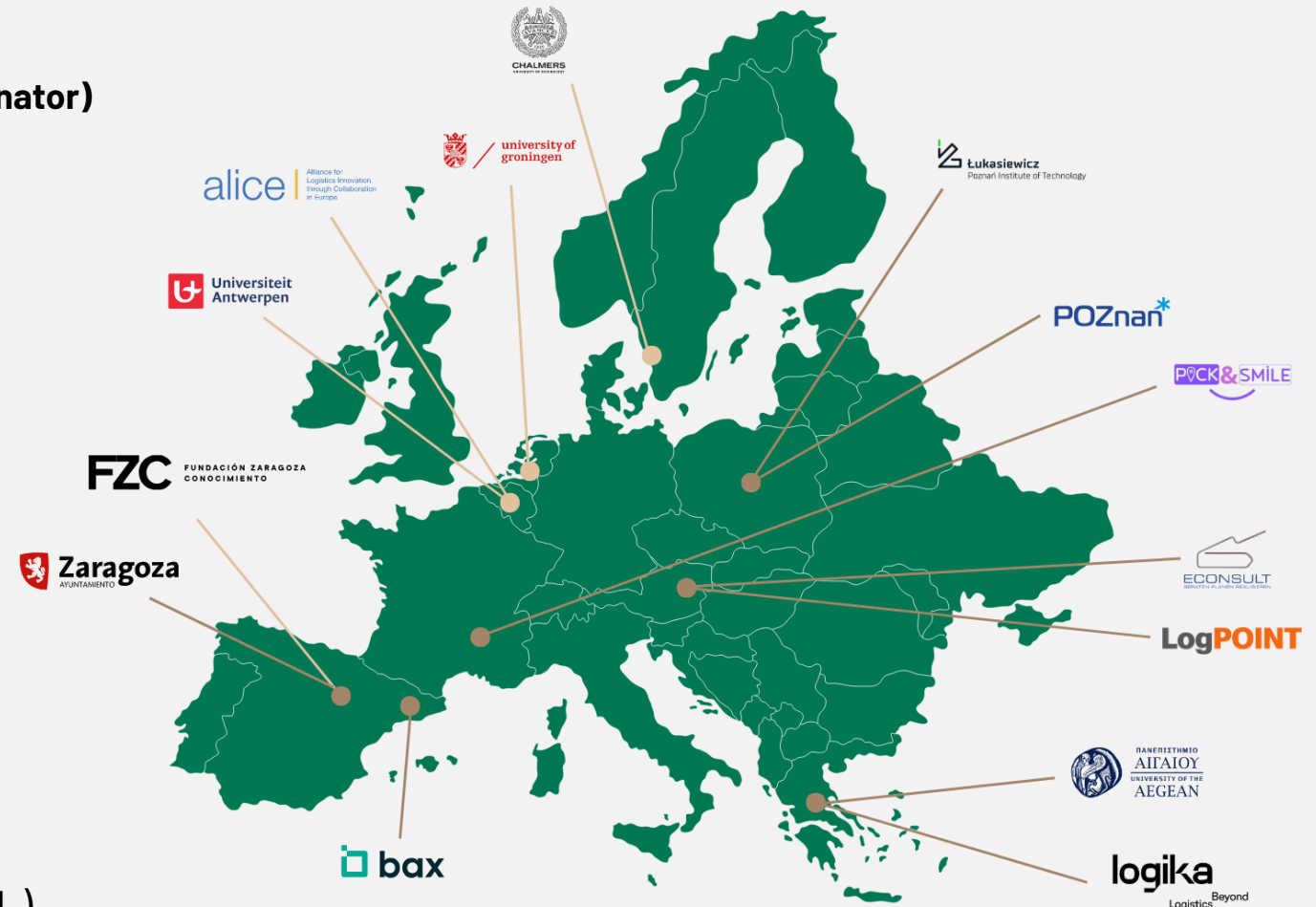
City of Saragossa (ES)

Fundacion Zaragoza Ciudad De Conocimiento (ES)

Urząd Miasta Poznań (PL)

Pick&Smile (FR)

Pilot sites: Athens (GR), Lyon (FR), Poznań (PL),
Vienna (AT), Zaragoza (SP)



Project goals

CONSOLIDATE

knowledge on attractive zero-emission delivery and return options, and successful behavioural interventions leading to greener choices

DEVELOP

a way to account for the footprint of e-commerce deliveries and returns

PROVIDE

replicable and scalable processes for retailers and logistics service providers to ensure information on environmental footprints

PILOT & TEST

solutions for zero-emission e-commerce logistics & behavioural interventions that lead to more sustainable e-commerce practices

UP-SCALE & PROMOTE

the implementation of zero-emission delivery and return options and digital communication practices with consumers

SUPPORT

public authorities in determining the policy and regulatory action to foster sustainable e-commerce deliveries and returns

Markets covered

consumer electronics (B2C)
re-commerce (B2C2C)
fashion/clothing (B2C)
food & beverages (B2C, B2B)
fresh produce (G2B2C)



CodeZERO is a transformative three-year initiative focused on co-designing sustainable, zero-emission last-mile delivery and return solutions for e-commerce. Our mission is to make these solutions attractive for consumers and viable for retailers, logistics service providers and local authorities.



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CodeZERO Pilots



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CodeZERO Structure and objectives

Analysis



ANALYSIS of CURRENT DELIVERY MODELS
ANALYSIS of CONSUMERS' BEHAVIOUR
CodeZERO ASSESSMENT FRAMEWORK

Design



DESIGN of CodeZERO SOLUTIONS

- Sustainable delivery solutions for e-commerce
- Communication guidelines
- Toolset for local authorities

Test



TESTING SOLUTIONS: CodeZERO LIVING LABS



MILAN (IT)



ANTWERP (BE)

UTRECHT (NL)



OSLO (NO)

Consolidation



CONCLUSIONS AND RECOMMENDATIONS

- Refinement of delivery solutions for e-commerce
- Refinement of communication guidelines
- Refinement of toolset for local authorities

DISSEMINATION, COMMUNICATION AND EXPLOITATION



Retailers



Consumers



Transport operators



Local authorities



8 Replicator Cities



8 Replicator Retailers



Researchers
Academia



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id



Introduction

A joined GreenTurn & CodeZERO webinar

CodeZERO - Kathleen Cauwelier

CodeZERO results: Why it is important to look at consumer behavior? Based on the CBC-findings highlight what's driving the preferences of online consumers

GreenTurn - Sanne Wolf

GreenTurn results: Sustainability communication that works.



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Table of contents

How can we reduce the environmental impact of ecommerce deliveries while meeting consumer expectations?

Questions discussed in this webinar

1. Why does sustainable e-commerce delivery matter?
2. What drives consumer delivery choices, and how important is sustainability in their decisions?
3. How can we encourage consumers to opt for greener delivery options?



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Consumers delivery choices

Why it is important to look at consumer behavior? Based on the CBC-findings highlight what's driving the preferences of online consumers

Kathleen Cauwelier (VUB) – CodeZERO



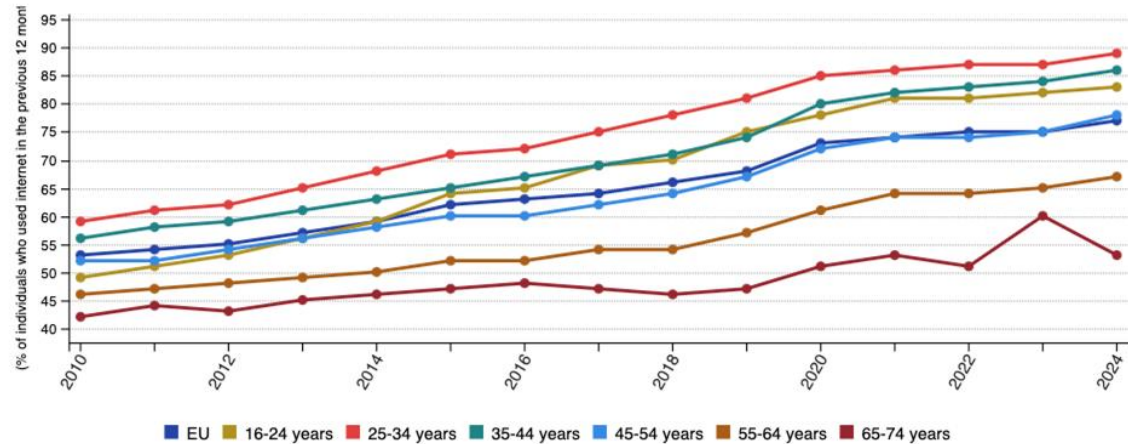
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Why does this matter?

E-commerce is here to stay

Internet users who bought/ordered good or services for private use in the previous 12 months by age group

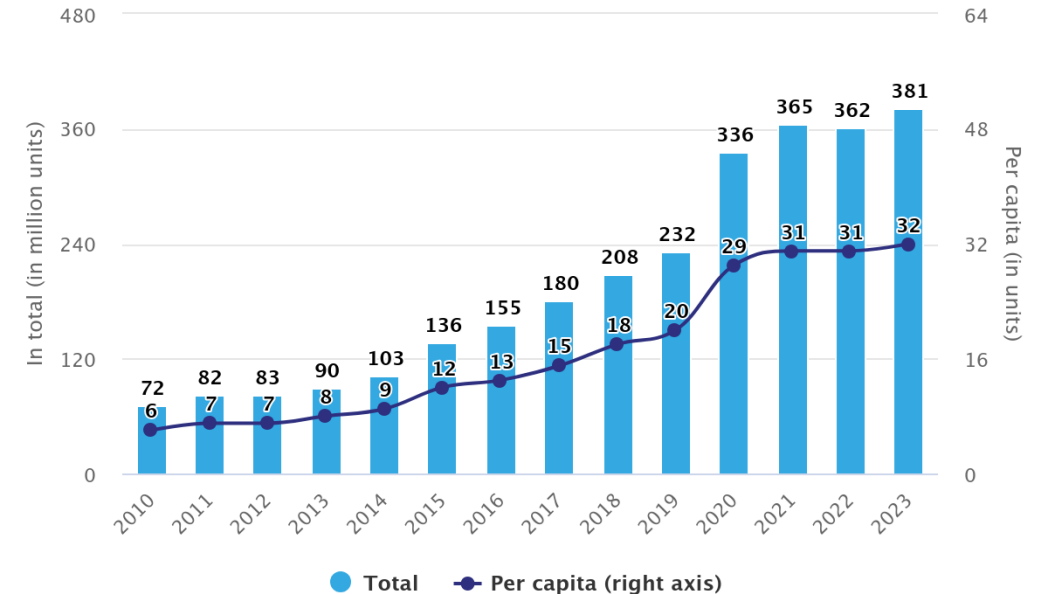


Note: Break in time series in 2021. Estimate in 2020, 2023.
Source: Eurostat (online data code: isoc_ec_ibuy and isoc_ec_ib20)

eurostat

Source: (Eurostat, 2024)

Evolution of the volume of parcel and express services in Belgium



www.ibpt.be

Source: (IBPT, 2024)



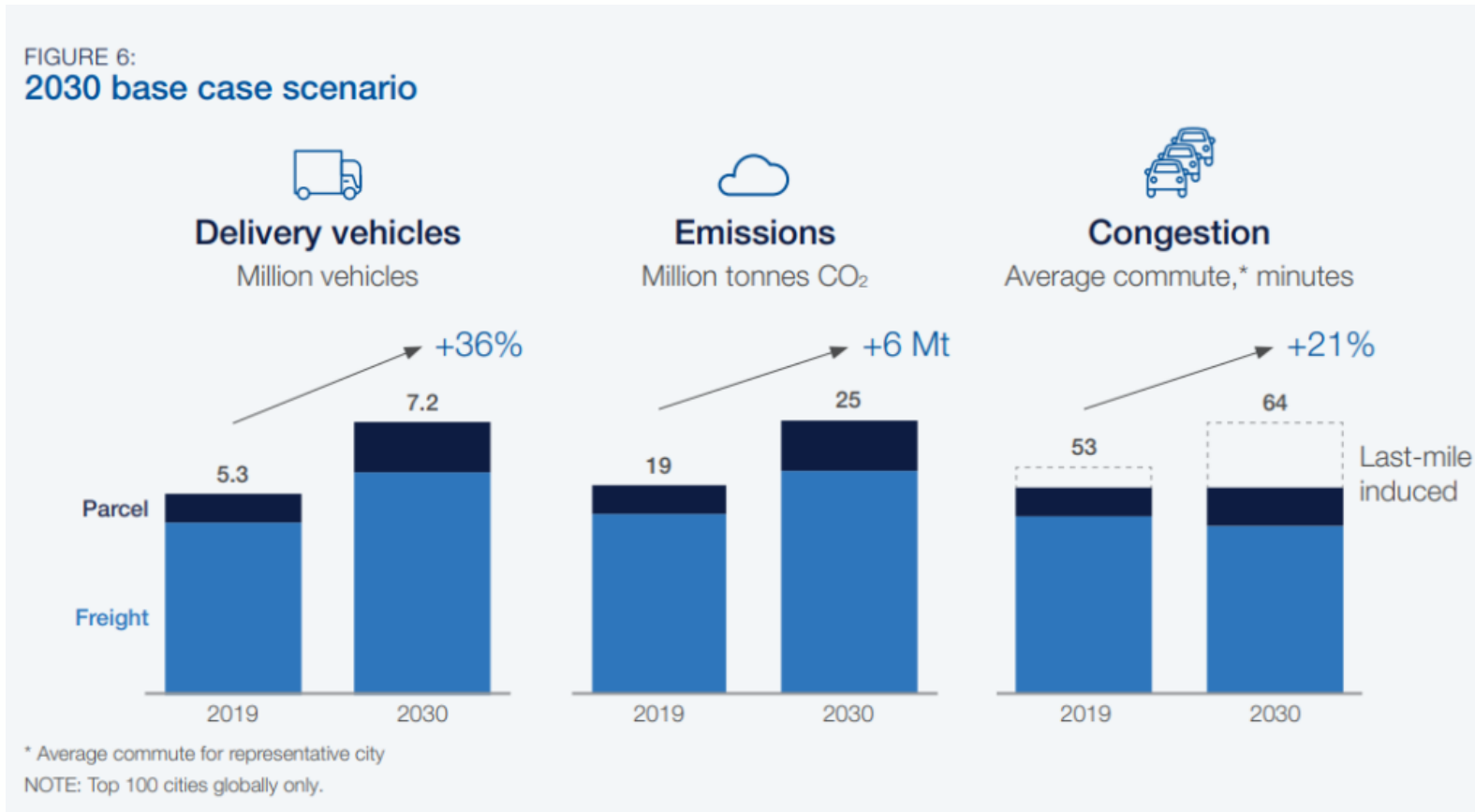
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Why does this matter?

Sustainability impact of parcel deliveries



Source: (World Economic Forum , 2020)

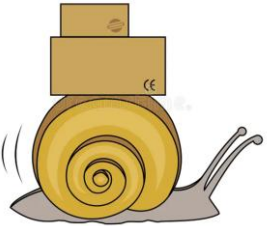


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Why does this matter?

Every delivery choice impacts sustainability,
consumers are key actors



What we wanted to understand?

What **delivery attributes** matter most?

Will consumers **choose greener delivery** options?
Under what **conditions**?

How do **preferences differ** across **consumer types, countries** and **product type**?



This project has received funding from the European union's Horizon Europe research and innovation programme under grant agreement Nr. 101146909.



The approach

16



	CodeZero	Green Turn
Who?	10,092 consumers	5000 consumers
From where?	10 countries	5 countries
Which products ?	3 product types	7 product types

Choice-based conjoint experiment: observe how consumers actually choose

- Various delivery attributes with different levels
E.g. delivery cost, delivery location, delivery speed.

Analysis

- Preferences scores
 - Consumer types
 - Product types
 - Country-level
- Segmentation based on attitudes and behaviour



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QUANTITATIVE ANALYSIS OF CONSUMER PREFERENCES

Deliverable 2.5

Version number: Final version

Date for release: 31/05/2025

Authors: Kathleen Cauwelier, Heleen Buldeo Rai, Janin Fauth, Philippe Lebeau (Mobilise, VUB)



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Choice-based conjoint experiment

18

Delivery
price


Delivery
location

Delivery
speed


Packaging

Tracking
information


Delivery
partner &
ethics

Leveringsprijs



€ 3.99

Leveringslocatie


Levering op het werk

Leveringstermijn



Binnen 1-3 werkdagen bezorgd

Tracking informatie


Verwachte bezorgdatum

Verpakking


Herbruikbare kartonnen doos

Keuze van leveringspartner


/

Selecteer

€ 6.99

Levering aan huis

Morgen bezorgd

Regelmatische bezorgupdates

Geen extra doos, alleen primaire verpakking

Lokale koerier via app



☒ Bezorging met fiets
☒ Goede arbeidsvoorwaarden
☒ Goede arbeidsomstandigheden

Selecteer

€ 2.99

Pakketautomaat (24/7)

Binnen 3-5 werkdagen bezorgd

Live volgen + levering aanpassen

Gerecycled karton

Milieu-vriendelijke leveringspartner



☒ Bezorging met fiets
☒ Goede arbeidsomstandigheden

Selecteer

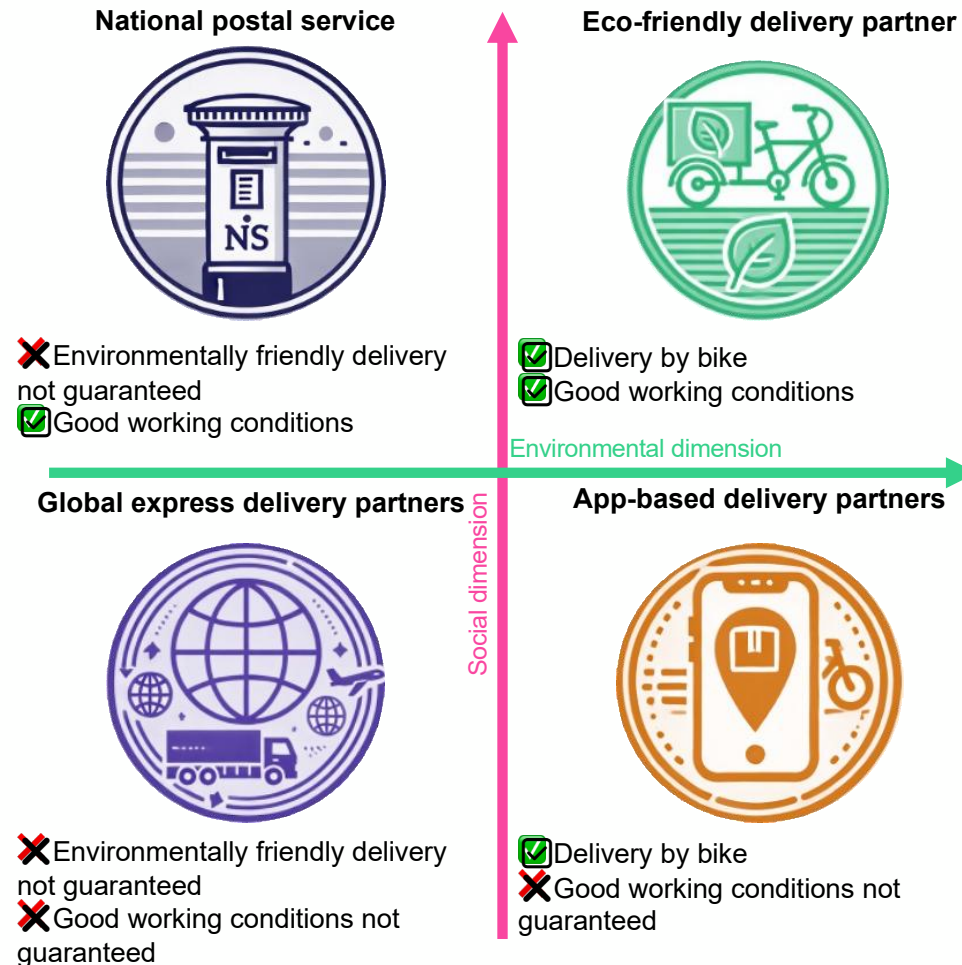


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Delivery partner & ethics attribute

Sustainability encompasses both environmental and societal dimensions

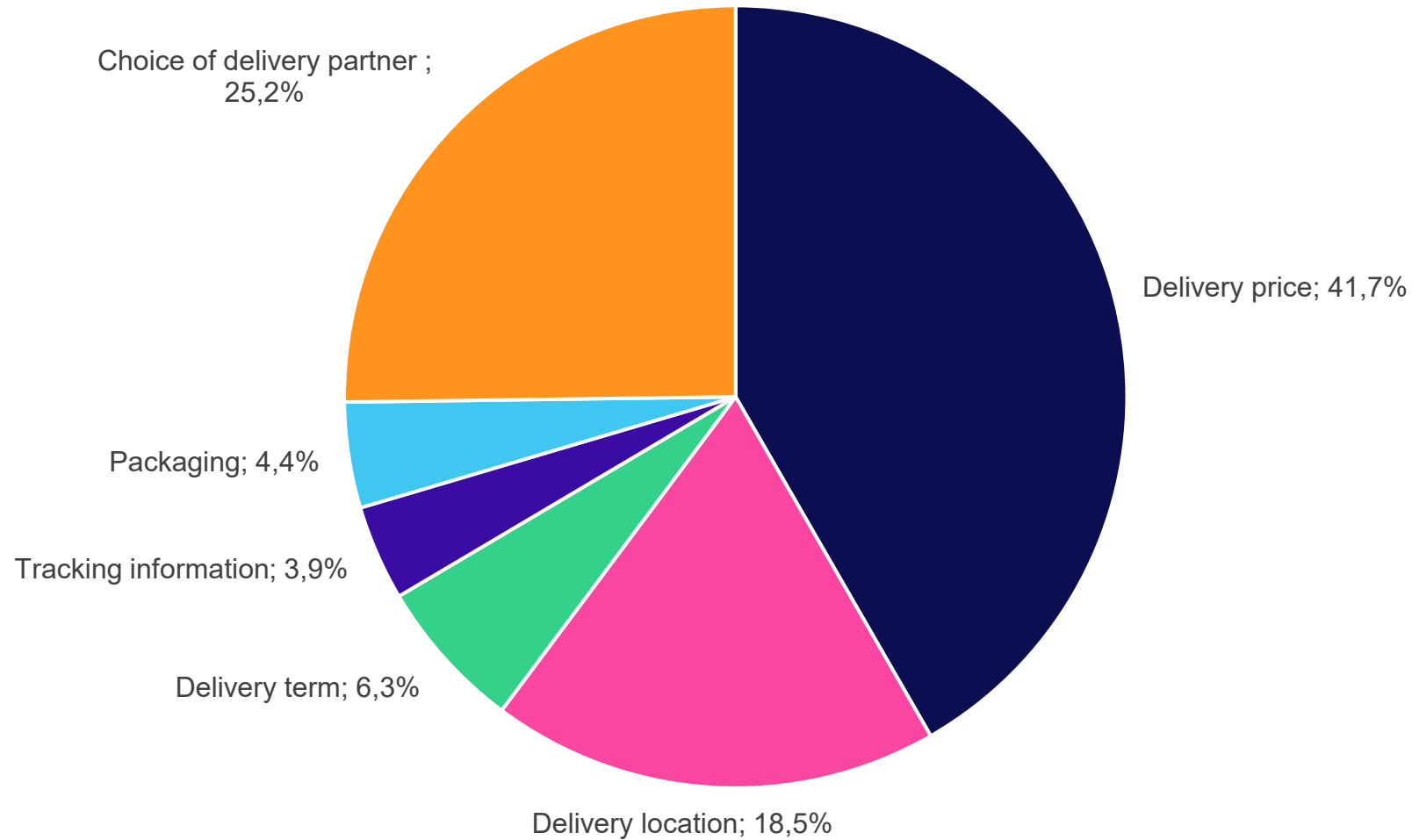


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What matters most?

20

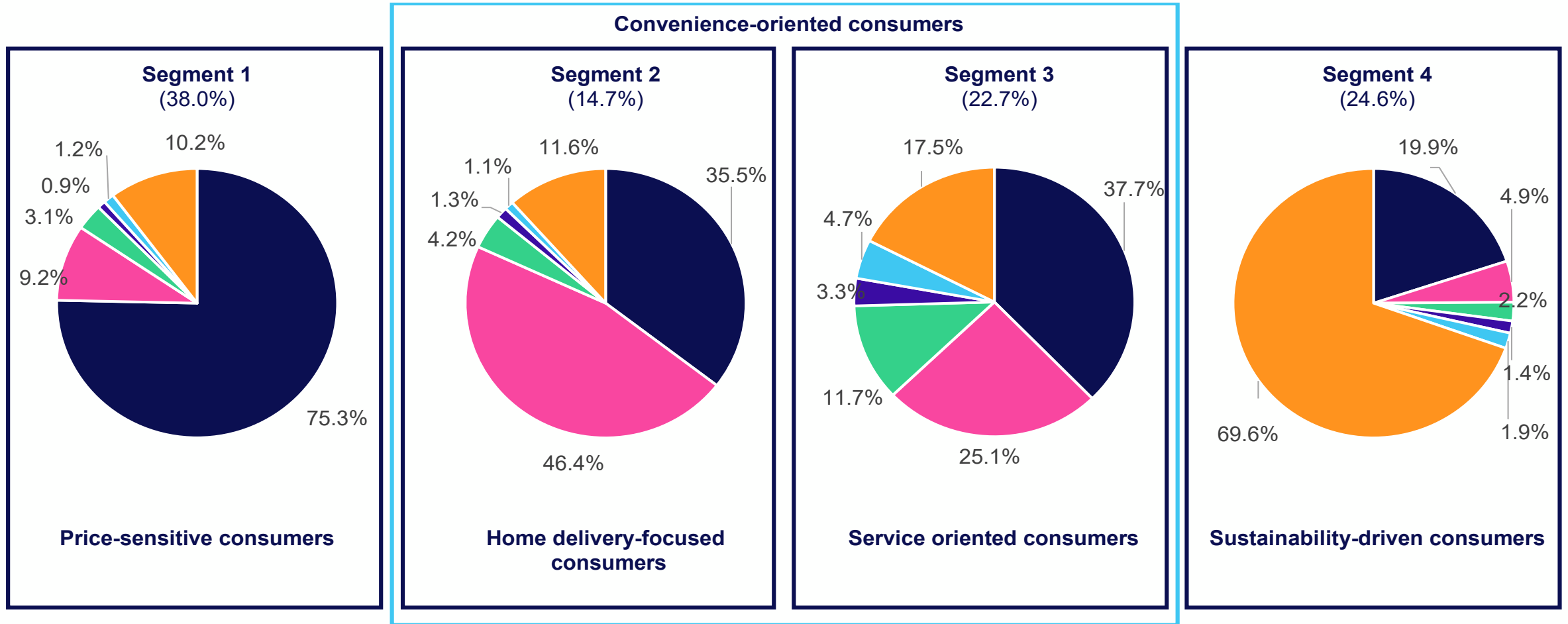


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... but not everyone is alike

21



■ Delivery price ■ Delivery location ■ Delivery term ■ Tracking information ■ Packaging ■ Choice of delivery partner

Different consumer profiles driven by different attributes = different strategies needed



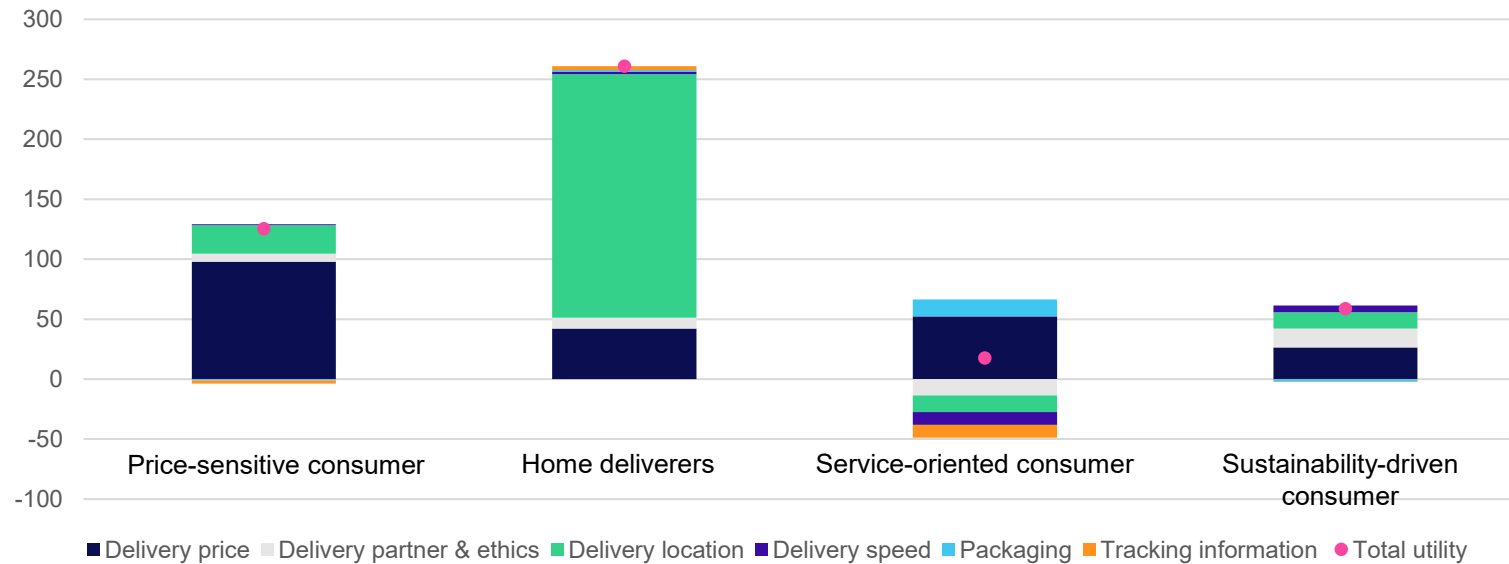
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Are consumers willing to change for a more sustainable delivery option? 22

Business-as-usual delivery options

Delivery location	Delivery price	Delivery speed	Delivery partner & ethics	Packaging	Tracking information
• Home delivery	• € 2.99	• Within 1-3 days	• No selection possible	• Cardboard box	• Basic tracking

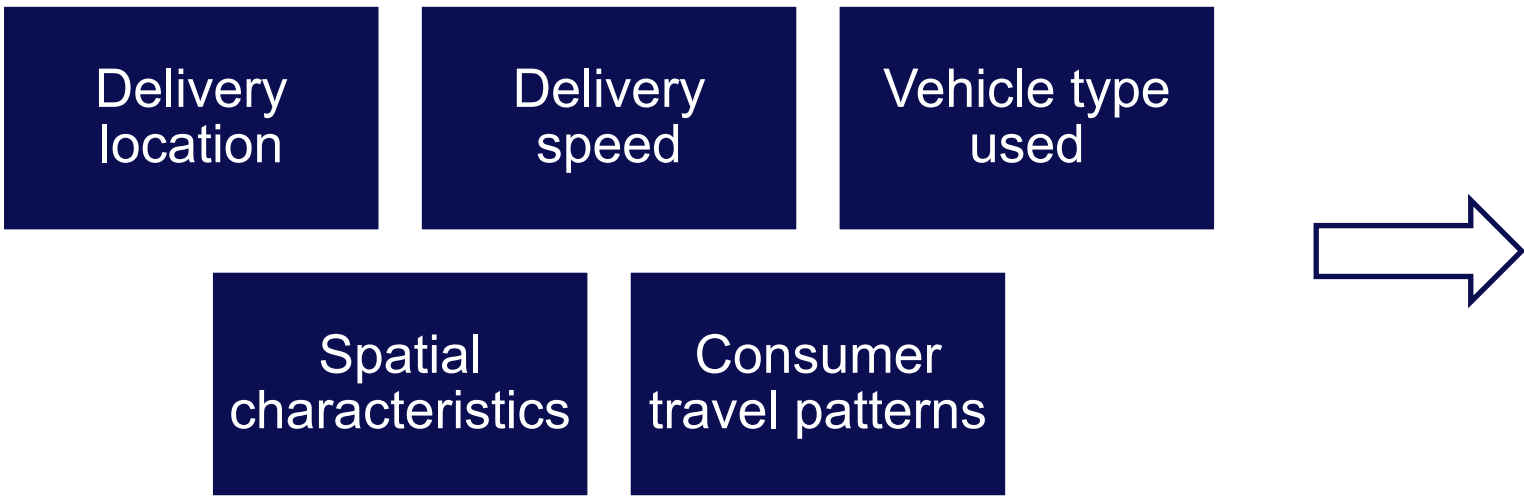


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Are consumers willing to change for a more sustainable delivery option?

What is a sustainable delivery option?



Are consumers willing to change for a more sustainable delivery option?

24

What is a sustainable delivery option?

Fixed attributes:
Delivery location:
Instore pickup –
Collection point –
Home Delivery &
**Delivery partner &
ethics:**
Eco-friendly delivery
partner

THREE REALISTIC PATHWAYS

Pathway 1



Instore pickup

- Most sustainable in dense urban areas where many stores are close by

Delivery price:

Free

Delivery speed:

Within two hours

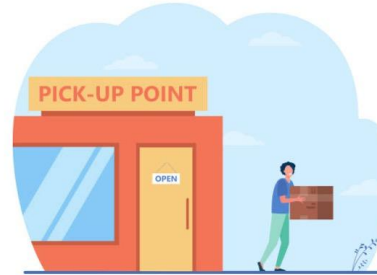
Packaging:

Cardboard

Tracking information:

Basic Tracking

Pathway 2



Collection points

- Most sustainable in town and suburbs (medium-density areas)

Delivery price:

€ 2.99

Delivery speed:

Tomorrow

Packaging:

Cardboard

Tracking information:

Route updates

Pathway 3



Home delivery

- Most sustainable in rural areas (spread-out areas)

Delivery price:

€ 3.99

Delivery speed:

1-3 days

Packaging:

Cardboard

Tracking information:

Time-window tracking

Source: (Mommens & Cauwelier, 2025; Mommens et al., 2021)



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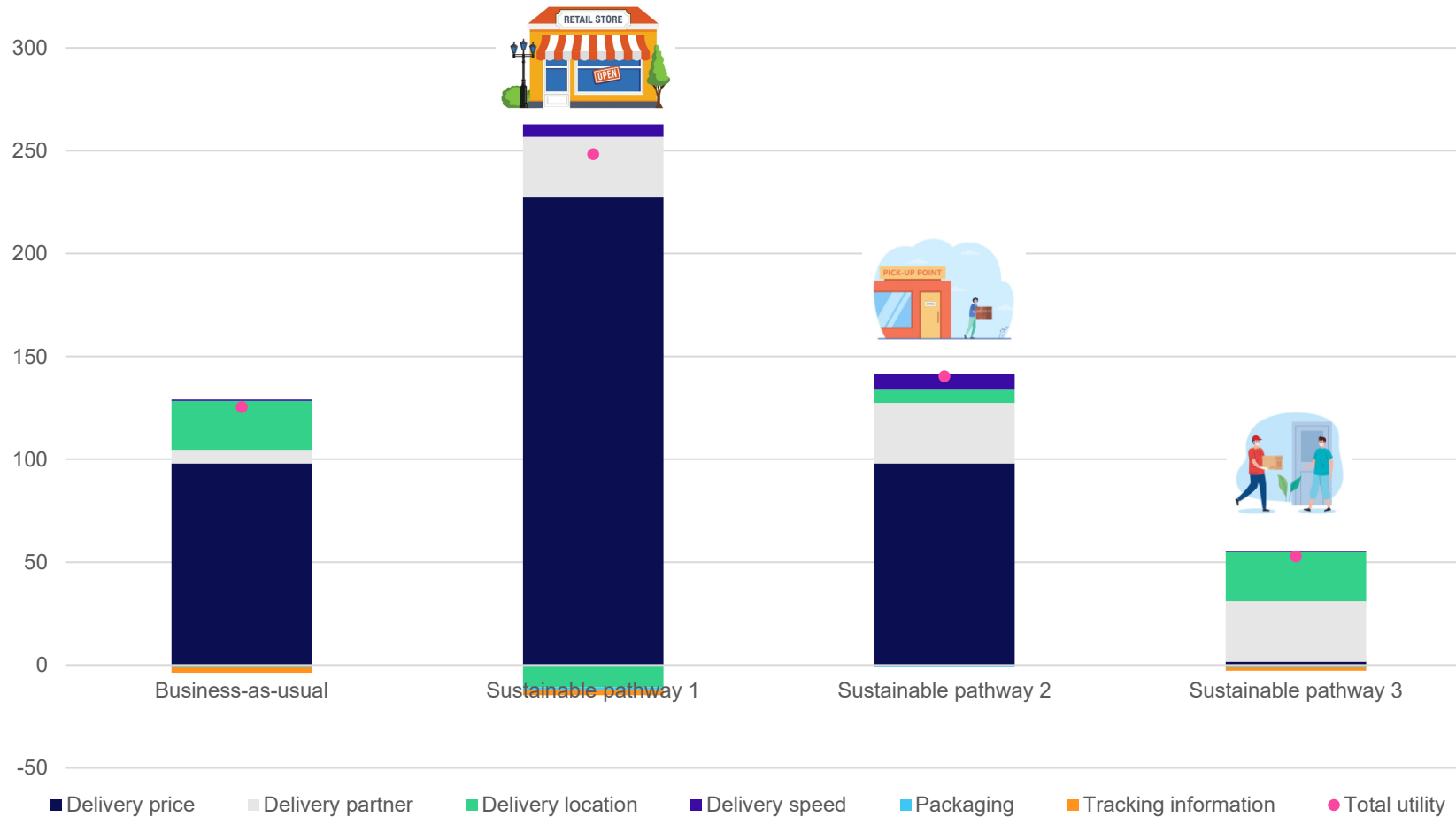
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Under which circumstances are consumers willing to change?

25

Price-sensitive consumers

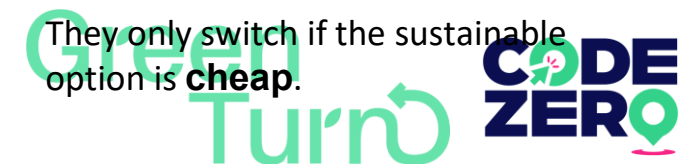


They only switch if the sustainable option is **cheap**

Preferable free or under € 2.99



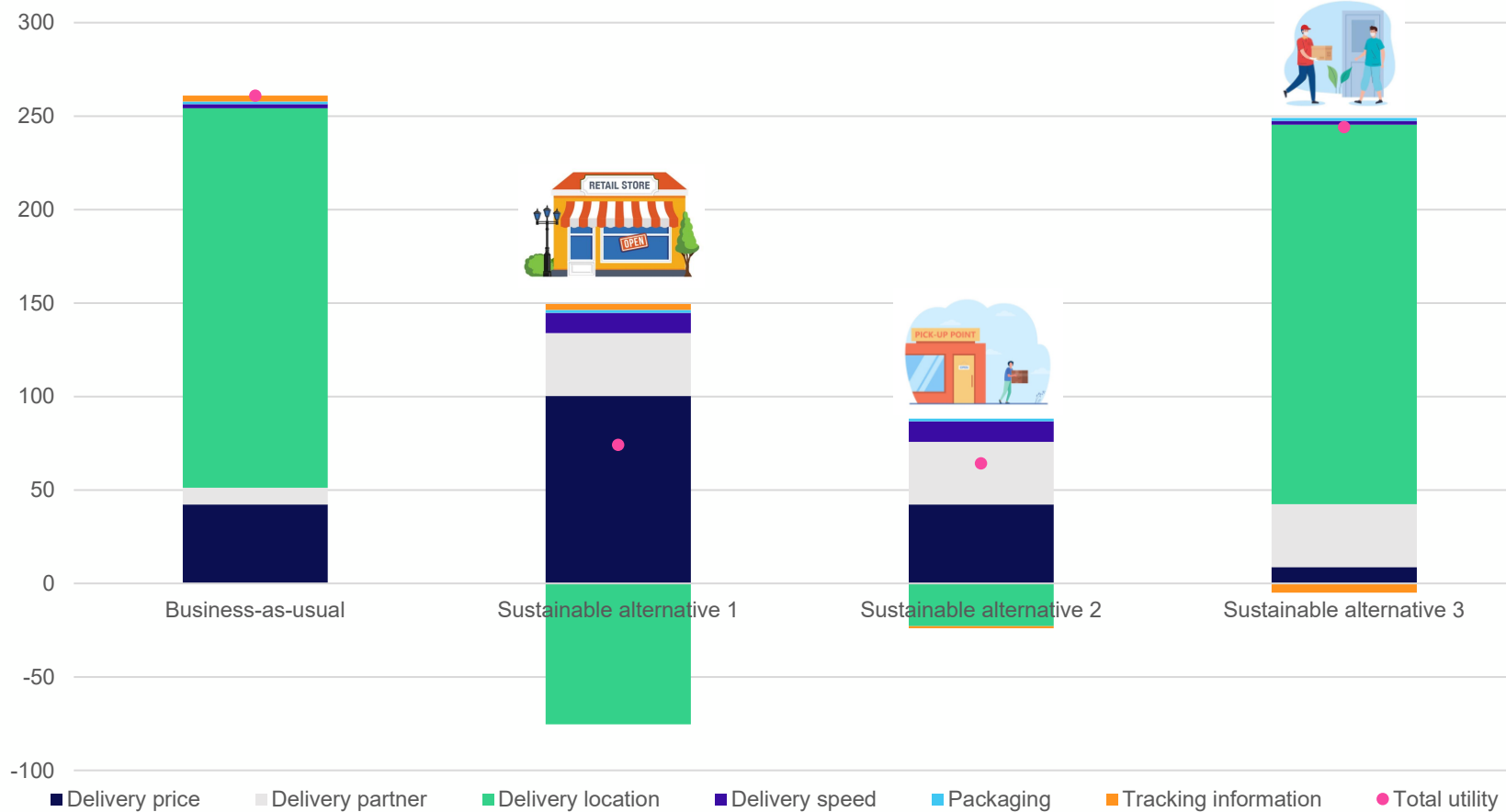
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Under which circumstances are consumers willing to change?

26

Home deliverers



They are hard to move as home delivery is such an important aspect

Show greater acceptance to pay more

Under which circumstances are consumers willing to change?

Service-oriented consumers

27



They want **speed** and **out of home delivery option** to accept sustainable options



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Under which circumstances are consumers willing to change?

28

Sustainability-driven consumers



They already accept slower , more expensive, different delivery location as long as the delivery partner is eco-friendly



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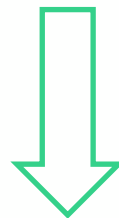
Main takeaways

Consumers are not alike

- Switching depends on their #1 driver
- No single “best” sustainable delivery option exists

What matters the most

- Price-sensitive consumers: Cheap/Free
- Home deliverers: Comfort
- Service oriented: Speed and ease
- Sustainability-driven: Eco-impact proof



How do we frame sustainable delivery in a way that consumers actually choose it?



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Any question?

Don't hesitate to type in the chat



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Encouraging consumers to opt for greener delivery options

How can we effectively encourage consumers to choose sustainable delivery?

Sanne Wolf (RUG) – GreenTurn



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Encouraging consumers to opt for greener delivery options

State of practice

Conducted **interviews** with various stakeholders and looked at the **checkout page** of 70 large European webshops.

- Few webshops (around 20%) try to actively encourage consumers to choose sustainable options
- Barriers identified in interviews: knowledge, regulation, and operational barriers.

Survey: Communication that works

- **Sample:** 5000 respondents from 5 different countries
- Asked respondents which type of **messages** encouraged them most to choose sustainable delivery options
- Collected information on **demographics** and **attitudes** towards (social and environmental) sustainability

Encouraging consumers to opt for greener delivery options

Motivational power of different messages

Asked respondents how much each of these messages would motivate them to choose sustainable delivery options:

1. This delivery option results in a X% decrease in CO₂ emissions.
2. This delivery option is more sustainable because we are already in your street on that day, so we drive fewer kilometres, which leads to fewer emissions.
3. This delivery option helps reduce CO₂ emissions by X kg, which is equivalent to saving X kilometres of car travel.
4. This delivery option improves the air quality in your neighbourhood and limits the congestion in the streets.
5. This delivery option helps reduce CO₂ emissions by X kg, which is equivalent to saving X trees.



Encouraging consumers to opt for greener delivery options?

34

Motivational power of different messages

Message Type	Mean
Message 1: Results in a X% decrease in CO ₂ emissions.	3.18
Message 2: More sustainable because we are already in your street on that day, so we drive fewer kilometres, which leads to fewer emissions.	3.46
Message 3: Helps reduce CO ₂ emissions by X kg, which is equivalent to saving X kilometres of car travel.	3.32
Message 4: Improves the air quality in your neighbourhood and limits the congestion in the streets.	3.44
Message 5: Helps reduce CO ₂ emissions by X kg, which is equivalent to saving X trees.	3.43

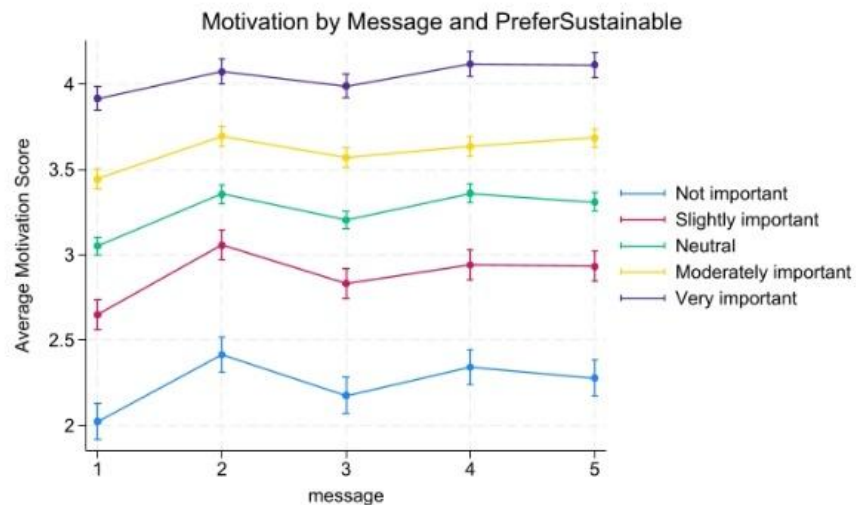
Encouraging consumers to opt for greener delivery options?

Does this motivational power differ per consumer?

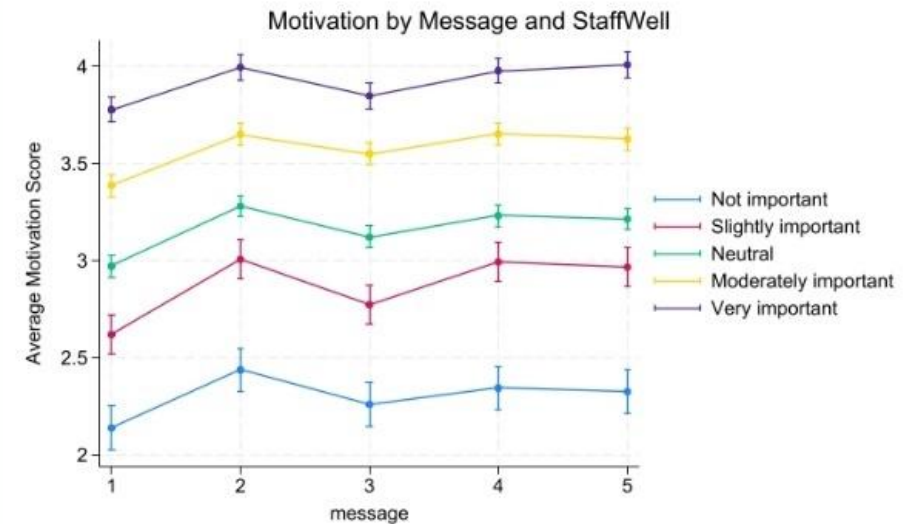
- Nationality:** French and Spanish consumers perceive messages as more motivating
- Age:** Younger consumers perceive messages as more motivating
- Gender:** Female consumers perceive messages as more motivating
- Attitudes:** Eco-conscious consumers and consumers that value staff treatment more perceive messages as more motivating

Encouraging consumers to opt for greener delivery options?

Prefers sustainable products



Values employee treatment



Messages

Message 1: Results in a X% decrease in CO₂ emissions.

Message 2: More sustainable because we are already in your street on that day, so we drive fewer kilometres, which leads to fewer emissions.

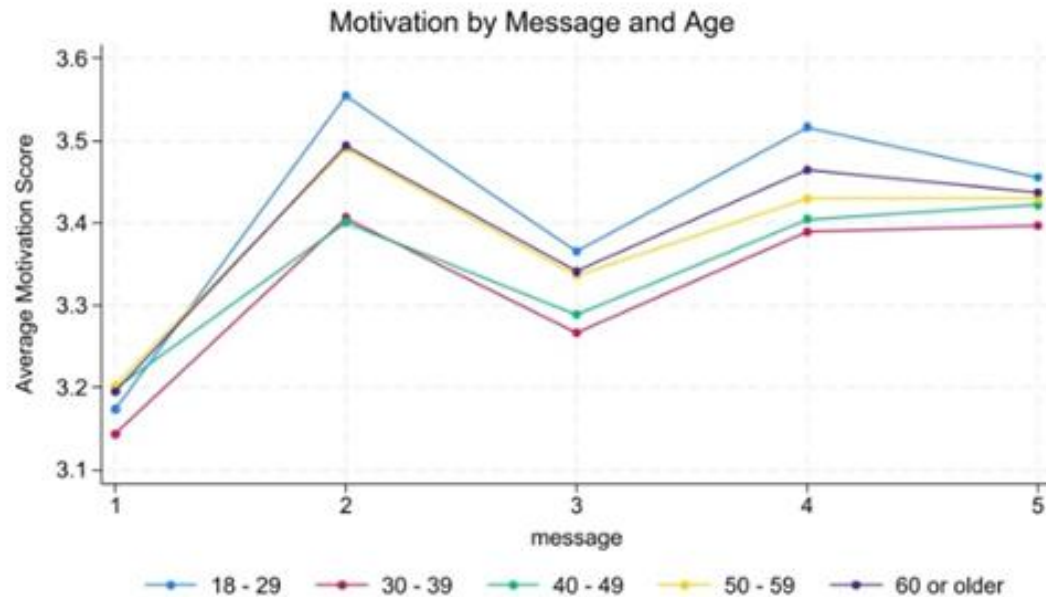
Message 3: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X kilometres of car travel.

Message 4: Improves the air quality in your neighbourhood and limits the congestion in the streets.

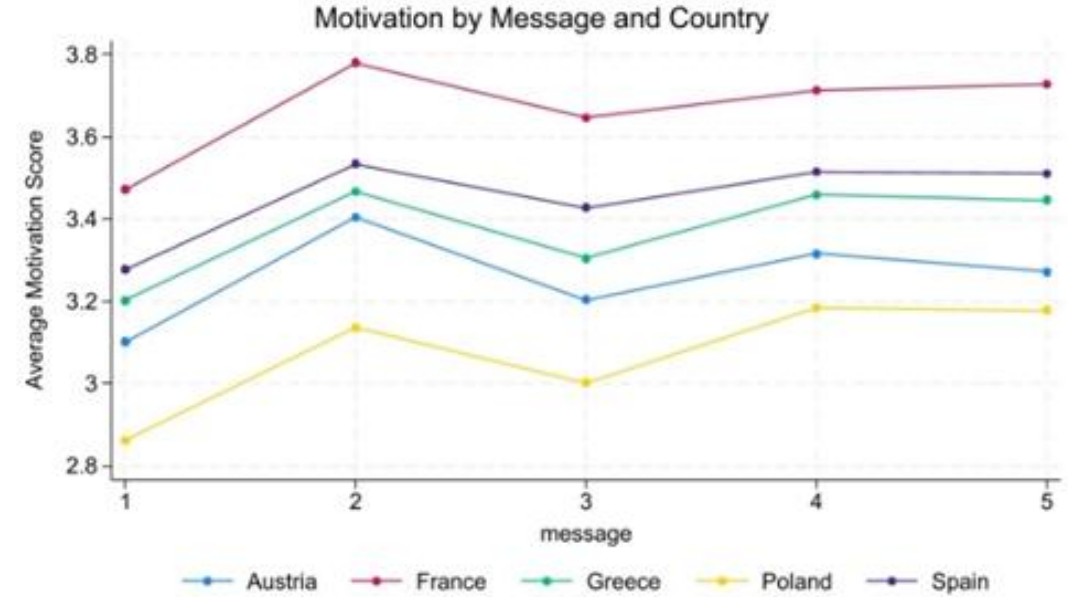
Message 5: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X trees.

Encouraging consumers to opt for greener delivery options?

Age



Country



Messages

Message 1: Results in a X% decrease in CO₂ emissions.

Message 2: More sustainable because we are already in your street on that day, so we drive fewer kilometres, which leads to fewer emissions.

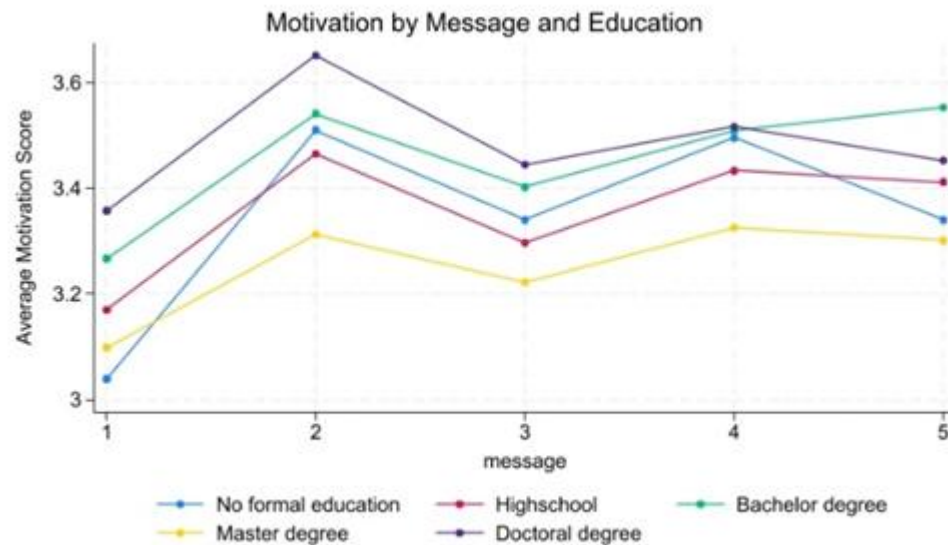
Message 3: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X kilometres of car travel.

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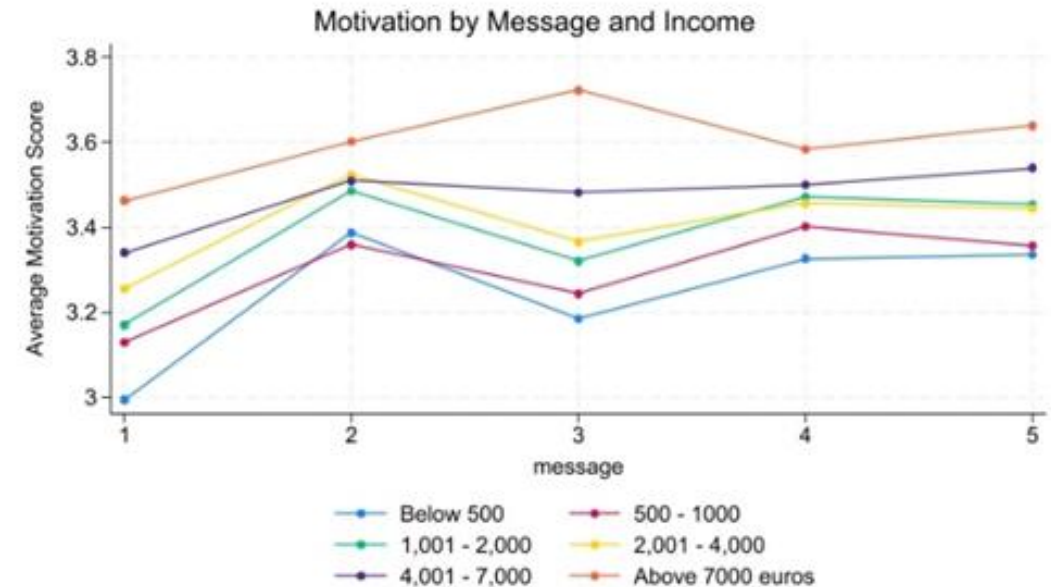
Message 5: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X trees.

Encouraging consumers to opt for greener delivery options?

Education



Income



Messages

Message 1: Results in a X% decrease in CO₂ emissions.

Message 2: More sustainable because we are already in your street on that day, so we drive fewer kilometres, which leads to fewer emissions.

Message 3: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X kilometres of car travel.

Message 4: Improves the air quality in your neighbourhood and limits the congestion in the streets.

Message 5: Helps reduce CO₂ emissions by X kg, which is equivalent to saving X trees.

Encouraging consumers to opt for greener delivery options?

Main takeaways: Communication that works

- **Transparent, credible**, and motivating communication is important in engaging consumers in sustainable delivery choices.
- Based on interviews and survey results we identify barriers and success factors
 - Barriers: technical jargon, abstract data, lack of relatability
 - Success factors: **tangible** messages, emotional **resonance**, clear ecological or social impact
- Effective messaging makes benefits **relatable**
 - Example: *Not “X kg CO₂ saved”, but “Y trees planted / Z km car travel avoided”.*
- Consumers are more likely to act when they see how their **choice contributes to broader outcomes** like cleaner air or reduced congestion.





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Conclusion and Q&A



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