UNIVERSITÀ DI TORINO

ISSN 2704-9906

EJSICE

EUROPEAN JOURNAL OF SOCIAL IMPACT AND CIRCULAR ECONOMY

VOLUME 6, ISSUE 3

DECEMBER 2025

Fully open access and available online at http://www.ojs.unito.it/index.php/ejsice/

AIMS AND SCOPE

The European Journal of Social Impact and Circular Economy (**EJSICE**) is an online open-access journal published by the University of Turin. The Journal publishes quarterly (every four months) articles that contribute to the development of both theory and practice of research methods used throughout the field of social impact and circular economy. The readers of this Journal are mainly researchers, academics, PhD students and other practitioners.

European Journal of Social Impact and Circular Economy

Published by

EDITOR-IN-CHIEF

Paolo Pietro Biancone
Department of Management
"*Valter Cantino*",
University of Turin, Italy

ASSOCIATE EDITORS

Mario Calderini
School of Management,
Polytechnic University of Milan,
Italy

Marco Meneguzzo
Università della Svizzera Italiana,
Switzerland

Silvana Secinaro
Department of Management
"*Valter Cantino*",
University of Turin, Italy

EDITORIAL MEMBERS

JOURNAL MANAGERS AND COPYEDITING TEAM

Valerio Brescia
Davide Calandra
Federico Chmet
Federico Lanzalonga
Michele Oppioli
Ginevra Degregori
Lara Demarchi
Federica Bassano

University of Turin,
Department of Management "Valter Cantino"

INDEXING

- **SCIENTIFIC JOURNAL FOR ANVUR** (i.e., the Italian National Agency for the Evaluation of Universities and Research Institutes) in both AREA 13 - Economic and statistical sciences and AREA 14 - Political and social sciences.
- **Q4 IN AIDEA RANKING** FOR MULTISECTORAL BUSINESS AREA

European Journal of Social Impact and Circular Economy

UNIVERSITÀ DI TORINO

Common Factors Influencing Waste Minimisation Behaviour in OECD Countries: A Systematic Review.

Homer Xu[1*], Metin Işık[2]

[1]Bitlis Eren University, Faculty of Economic and Business, Business Administration Department, Bitlis (Türkiye)

kowhai1212@gmail.com

*contact author

ORCID 0009-0005-1787-1851

[2]Bitlis Eren University, Faculty of Economic and Business, Business Administration Department, Bitlis (Türkiye)

beu.metin@gmail.com

ORCID 0000-0003-4577-0095

Received: 15/05/2025

Accepted for publication: 17/11/2025

Published: 29/12/2025

Abstract

Waste minimisation is a crucial component of sustainability efforts in Organisation for Economic Co-operation and Development (OECD) countries, where high consumption and production levels significantly contribute to global waste challenges. This study systematically reviews 99 scholarly articles related to the OECD from the past decade to identify and categorise the common factors influencing waste minimisation behaviour. Five key factor groups emerged from the analysis: individual factors, social/ collective factors, economic factors, administrative/ interventional factors, and media/ technology factors. Notably, 67% of the reviewed papers focus on food waste reduction, highlighting its significance in waste minimisation efforts. These findings emphasise the interconnected nature of these factors and indicate the need for integrated, multidimensional strategies to address waste challenges effectively. The study provides a valuable reference for policymakers, organisations, and researchers who are aiming to design holistic and sustainable waste management interventions. This review covers studies published between 2015 and 2024, thereby capturing the most recent years of research developments within OECD contexts.

Keywords: waste minimisation behaviour, circular economy, waste hierarchy, waste minimisation, OECD

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

1. Introduction

Waste minimisation has emerged as a crucial strategy in global sustainability efforts, focusing on source reduction, enhanced recycling, and principles of the circular economy (Cheremisinoff, 2003). The approach is recognised as essential for mitigating climate change, conserving natural resources, and reducing pressure on landfill ecosystems (World Bank, 2018). The global waste management challenge has reached critical levels, with municipal solid waste (MSW) generation increasing from 2.01 billion tonnes in 2018 to 2.13 billion tonnes in 2020 (World Bank, 2018; Alves, 2024). OECD countries face particular challenges in this regard, with Austria, Denmark and the United States generating over 800 kg of waste per capita - among the highest rates worldwide (Alves, 2025). This excessive waste generation stems from high-consumption lifestyles and linear economic models of "production-consumption-disposal" that dominate industrialised nations (Ertz et al., 2021). OECD countries play a vital role in advancing these solutions due to their high levels of production and consumption, with many implementing innovative policies and technologies.

Notable examples include Germany's stringent waste separation laws and high recycling standards (Handbook Germany, 2022), Denmark's advanced waste-to-energy facilities (Mazzanti & Zoboli, 2008), and South Korea's effective Pay-As-You-Throw (PAYT) systems (Lee & Paik, 2011; Envac, 2024). The European Union's Waste Framework Directive provides overarching guidance, emphasising waste prevention and resource efficiency (OECD, 2019b). Japan's comprehensive 3R (Reduce, Reuse, Recycle) Initiative demonstrates the importance of public education and community participation in driving behavioural change (Moshkal et al., 2024). New Zealand's government waste work programme, which covers 'Waste and resource efficiency strategy', 'Phasing out hard-to-recycle and single-use plastics', 'Improving household recycling and food scrap collections', 'Container return scheme', 'Product stewardship', and 'Waste disposal levy', tackling the major challenges in waste management area (NZ MoE, 2024).

These diverse approaches highlight a crucial consensus: successful waste minimisation requires alignment between regulatory frameworks, technological infrastructure, economic incentives, and public engagement (Kaza et al., 2018; Ellen MacArthur Foundation, 2019). According to multiple studies and reports, the variation across OECD nations also reveals how cultural and social contexts significantly influence sustainable waste behaviours (Hornik et al., 1995; Barr, 2007; Ertz et al., 2016; OECD, 2021).

Globally, waste management strategies increasingly emphasise the upper levels of the waste hierarchy - prevention, reuse, and recycling - rather than focusing solely on downstream disposal methods (Zacho & Mosgaard, 2016). This shift reflects growing recognition that sustainable solutions must address the entire product lifecycle, from eco-design and green purchasing to end-of-life recovery (OECD, 2019a). Among all waste streams, food waste presents a particularly pressing challenge. As the majority component of municipal solid waste (MSW), food waste itself indicates the severity of the situation (Melikoglu et al., 2013; Rahman et al., 2024). The issue carries dual significance: while millions face food insecurity, decomposing organic waste in landfills generates methane - a potent greenhouse gas contributing to climate change. This dilemma underscores the pressing need for enhanced organic waste management strategies across OECD nations.

While institutional policies and technological solutions are essential, individual behaviours collectively determine waste management outcomes (Raghu & Rodrigues, 2020). Daily decisions about waste sorting, recycling, composting, and

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

consumption patterns create substantial cumulative impacts (Semenza et al., 2008). Research demonstrates that behavioural interventions can significantly enhance waste minimisation when properly designed and implemented. Environmental awareness serves as a key driver of pro-environmental behaviours (Venghaus et al., 2022). The Theory of Planned Behaviour (Ajzen, 1991) provides a framework for understanding how personal attitudes, subjective norms, and perceived behavioural control influence waste-related actions (Maibach, 2019; Etim et al., 2025).

However, awareness alone is insufficient for individuals. The accessibility and convenience of waste management systems have a profound impact on participation rates (Hage et al., 2009). Well-designed infrastructure, such as kerbside recycling programs, can dramatically increase engagement, while confusing or inconvenient systems often lead to non-compliance despite high awareness levels (Allcott, 2011). On the other hand, social and cultural factors also play an important role in waste management. Community-led initiatives such as neighbourhood composting programs and repair cafes have proven effective in normalising sustainable practices (Hasan, 2004; Grant, 2025). Targeted education campaigns and strategic communication further help bridge knowledge gaps and encourage long-term behaviour change (Schultz, 2014).

Addressing waste management issues in this context requires integrated, multidimensional strategies that consider psychological factors influencing individual behaviour, social and cultural contexts, physical infrastructure, administrative systems, and supportive policy frameworks. These factors are examined in this study as key drivers of research in the context of waste management in OECD countries. This paper aims to collect existing scientific literature within the OECD scope and conduct a holistic analysis of the psychological and situational factors that affect individuals' behaviours in the process of waste minimisation. Specifically, the study seeks to provide a reference resource for policymakers and organisations or groups implementing relevant policies across various countries. The objective of the study is to identify common factors affecting individuals' waste minimisation behaviour through a literature review, and to contribute to the long-term development goals of OECD countries with these findings. By grounding this study in recent literature, it intends to bridge existing research gaps and provide practical insights for sustainable development.

Despite the growing body of work on waste minimisation, notable research gaps remain. First, economic incentives and technological drivers are comparatively underexplored compared to psychological and social factors. Second, the interaction between policy frameworks and individual or collective behaviours has not been sufficiently synthesised. Finally, few reviews focus explicitly on OECD countries, where high-consumption patterns and advanced policy frameworks coexist with persistent waste challenges.

Based on these gaps, this study addresses the following research questions (RQs):

RQ1: What common individual, social, economic, administrative, and technological factors influence waste minimisation behaviours in OECD countries?

RQ2: How have these factors been conceptualised and studied in the past decade (2015–2024)?

RQ3: What implications do these findings hold for future policy design and research directions?

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

2. Conceptual and Theoretical Frameworks

2.1 Conceptualising Waste Minimisation

Waste minimisation is a strategy of waste management that focuses on reducing the quantity of waste and mitigating the hazards associated with existing waste (Saxena, 2024). In the sense of holistic waste management, waste minimisation refers to the strategic reduction of waste generation and the efficient use of resources to limit environmental, economic, and social impact. It emphasises the minimisation of waste generation instead of encouraging downstream waste treatment (Cheremisinoff, 2003). This approach aligns with the principles of sustainable development by prioritising resource efficiency, reducing hazardous waste, and promoting environmentally friendly practices across industries and households (OECD, 2021).

In the context of OECD countries, waste minimisation is particularly critical given their high levels of consumption and waste generation. As part of the development goals, waste minimisation extends beyond traditional disposal methods to incorporate the principles of a circular economy. This model emphasises designing products for durability, repairability, and recyclability, thus reducing waste through reuse and resource recovery (OECD, 2019a). A successful waste minimisation strategy requires collaboration across all sectors of society, including governments, industries, and individuals, to ensure the sustainable use of resources.

Waste minimisation in OECD countries involves policies, technologies, and practices aimed at reducing the quantity and toxicity of waste generated at the source (so-called "source reduction") and improving the efficiency of resource use with circular economy principles. It encompasses all types of waste, including municipal, industrial, hazardous, and electronic waste (OECD, 2019a). To this point, waste minimisation holds importance as it contributes to environmental protection and is also beneficial from a business perspective (Saxena, 2024). Therefore, the conceptualisation of waste minimisation in the context of OECD includes these key themes based on relevant literature:

Policy and Regulations - OECD countries have implemented strict regulations, such as the EU Waste Framework Directive (2008/98/EC), to prioritise waste prevention, reuse, and recycling. In addition, taxes on landfilling, extended producer responsibility (EPR), and subsidies for eco-design encourage waste minimisation (OECD, 2019a; OECD, 2021).

Technological Innovation - Investments in green technologies, such as advanced recycling systems and biodegradable materials, play a critical role (Mazzanti & Zoboli, 2008).

Behavioural and Cultural Change - Public awareness campaigns and education have proven effective in reducing waste at the consumer level (Barr, 2007; Lisciani et al., 2024).

Circular Economy Practices - Shifting from a linear economy to a circular one, emphasising reuse, repair, and recycling, is central to OECD strategies (OECD, 2019a).

2.2 Waste Hierarchy

The waste hierarchy is a cornerstone of modern waste management strategies, providing a structured approach to prioritise actions for reducing environmental impact. It is often depicted as an inverted pyramid, with the most preferred options at the top and the least desirable at the bottom (European Commission, 2008). This framework emphasises prevention, reuse, and recycling over less sustainable methods such as energy recovery and landfill disposal, aligning closely with the principles of

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

waste minimisation. Despite its strengths, implementing the waste hierarchy faces challenges, including inadequate infrastructure for prevention and reuse, low public awareness, and market barriers for recycled materials. Addressing these issues requires integrated approaches, including public education, technological innovation, and policy reforms (Shove et al., 2012).

The five-level waste hierarchy remains the most widely adopted framework for sustainable waste management, particularly within OECD nations. This hierarchy prioritises prevention as the most effective strategy, followed by reuse, recycling, energy recovery, and finally disposal as a last resort. Its implementation reflects a fundamental shift from linear waste management to circular economy principles (OECD, 2019a).

At the top of the hierarchy, *prevention* addresses waste reduction at its source through eco-design, sustainable production processes, and conscious consumption patterns. This approach aligns with the OECD's emphasis on Extended Producer Responsibility (EPR) schemes, which incentivise manufacturers to reduce material use and toxicity from the product design stage (European Commission, 2008). For instance, policies promoting durable goods design have helped several OECD countries decouple economic growth from waste generation.

Second to prevention in the waste hierarchy, *reuse and repurposing* serve as critical levers for decoupling economic growth from resource depletion. Unlike recycling, which requires energy-intensive processing, reuse systems preserve the embodied energy of products by extending their functional lifespans—a principle central to the OECD's Circular Economy Transition Framework. This approach aligns with the "policies of resource efficiency" advocated in the Global Material Resources Outlook (OECD, 2019b), which prioritises product-life extension over material recovery in terms of sustainability impact.

Recycling and composting fall into the third level. Recycling transforms waste materials into new products, reducing the need for virgin resources and lowering energy consumption compared to primary production processes. The OECD average recycling rate for municipal waste reached 45% in 2022, while many members are still facing challenges with organic waste (OECD, 2023). In fact, composting on this level plays a crucial parallel role to recycling for organic streams, diverting biodegradable waste from landfills where it would generate methane. Integrating composting into waste management systems can significantly reduce dependence on landfills, mitigate greenhouse gas emissions, and promote sustainable agriculture (Pergola et al., 2018; Yin et al., 2021).

Energy recovery refers to waste-to-energy solutions, such as incineration, gasification, pyrolysis, anaerobic digestion, and landfill gas recovery (EPA, 2025). It provides an alternative for non-recyclable materials, though its environmental trade-offs position it below recycling in the hierarchy. The OECD recommends strict emissions controls for such facilities, with some members, such as Sweden, achieving near-zero landfill rates through combined recycling and energy recovery (Cheremisinoff, 2003).

On the bottom level of the hierarchy, *disposal* represents the least desirable option. OECD policy instruments, such as landfill taxes and bans, have reduced the landfilling of plastic waste by 33% since 2000 (OECD, 2022), although disparities remain among member states.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

2.3 Circular Economy Principles

The circular economy (CE) represents a transformative model for sustainable resource management, moving away from the traditional linear economic model towards a regenerative system where waste is minimised, resources are reused, and environmental impacts are reduced (Ellen MacArthur Foundation, 2013; Murray et al., 2017). In the context of waste minimisation, circular economy principles are fundamental to designing systems that prioritise resource efficiency, product longevity, and the creation of closed-loop systems for material flows. By integrating principles such as eco-design, product life extension, and resource recovery, the circular economy offers a holistic approach to waste minimisation that aligns with global sustainability goals (OECD, 2021). This shift is particularly significant in OECD countries, where high levels of consumption and resource use have led to expansive waste generation and hiking environmental pressures (OECD, 2019a).

At its core, the circular economy emphasises three main principles: (1) designing out waste and pollution, (2) keeping products and materials in use, and (3) regenerating natural systems (Geissdoerfer et al., 2017). These principles align directly with the upper levels of the waste hierarchy, including reduce and prevention, reuse, recycling and composting. Policies such as the European Union's Circular Economy Action Plan have set ambitious targets for member states to enhance recycling rates, reduce single-use plastics, and foster a culture of sustainable consumption (European Commission, 2020).

From a waste minimisation perspective, the circular economy not only focuses on post-consumption waste management but also addresses upstream processes. Strategies such as industrial symbiosis, eco-design and product-as-a-service models aim to prevent waste at the source by improving efficiency and reducing material input through a design-redesign process (Ghisellini et al., 2016). Moreover, the circular economy fosters innovation in material science, with advancements in biodegradable materials, renewable energy technologies, and smart recycling infrastructure playing a critical role in waste minimisation efforts (Kirchherr et al., 2018). Waste minimisation-related behaviours of society members also form a key pillar of the circular economy, as conscious purchasing, sharing economies, and sustainable lifestyles are essential for reducing waste generation at the source (Ertz & Patrick, 2019). On the other hand, public awareness campaigns and education programs have proven effective in OECD countries, promoting behavioural shifts aligned with circular economy principles (OECD, 2021).

Recent scholarship has increasingly emphasised the role of digital tools and financial incentives in shaping waste minimisation behaviours. For example, mobile applications and smart bin technologies now support real-time waste tracking, gamification of recycling behaviours, and improved consumer awareness (Cagno et al., 2021); A growing convergence between emerging technologies and sustainability has been identified in multiple recent studies (Campana et al., 2025). Similarly, economic instruments such as deposit-return schemes, pay-as-you-throw models, and eco-subsidies demonstrate measurable effects on household and organisational behaviour (Parajuly et al., 2020; OECD, 2023). However, despite their growing importance, these economic and technological drivers remain underrepresented in the current literature (Wilson, Delmas, & Rajagopal, 2025), signalling an opportunity for future research and policy innovation.

2.4 Key Theories Understanding Waste Minimisation Behaviour

Several behavioural and psychological theories frequently appear in studies regarding waste minimisation behaviour, offering insights into the factors influencing individual and collective actions. These theories are most commonly seen in the literature

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

over the last decade, including the Theory of Planned Behaviour (TPB), Value-Belief-Norm (VBN) theory, and Social Practice Theory (SPT), among others.

2.4.1 Theory of Planned Behaviour (TPB)

The TPB, developed by Ajzen (1991), is one of the most widely used theories for understanding and predicting waste minimisation behaviour. It emphasises that an individual's intention to engage in a specific behaviour is influenced by three key factors: Attitude, Subjective Norms, and Perceived Behaviour Control. The TPB has been instrumental in identifying the psychological and situational factors that drive behaviours like recycling and composting (Taylor, 1995; Strydom, 2018; Mak et al., 2020). Through the study of recent topical literature over the past decade, the TPB identified predictors that are increasingly emerging at the upper level of the waste hierarchy, led by circular economy principles, such as greener shopping and avoiding food waste, among others. The findings are revealed in the findings section of this paper.

2.4.2 Value-Belief-Norm (VBN) Theory

The VBN theory developed by Stern et al. (1999) is a psychological framework used to explain pro-environmental behaviour, including waste minimisation practices. It suggests that individuals who prioritise altruistic and biospheric values are more likely to adopt waste minimisation practices. According to VBN, awareness of environmental consequences and a sense of responsibility are crucial in motivating waste reduction behaviours (Barr, 2007).

The key components of VBN theory include: (1) an Individual's value system (referring to Egoistic values, Altruistic values, and Biospheric values), which forms the foundation of the VBN theory. For example, studies have shown that individuals with strong altruistic and biospheric values are more likely to engage in waste minimisation behaviours, such as recycling and reducing consumption (Zhang et al., 2019; Schultz et al., 2005). And (2) Beliefs in the VBN framework are primarily based on the New Environmental Paradigm (NEP), which reflects an individual's worldview regarding the relationship between humans and the environment. It also includes an awareness of consequences, where individuals recognise the negative outcomes of their actions on the environment. Additionally, beliefs involve an attribution of responsibility, where individuals feel personally responsible for preventing environmental harm (Stern, 2000). And (3) Personal norms, which are moral obligations individuals feel to act in environmentally responsible ways. When individuals believe their actions can make a difference and that they are personally responsible, they are more likely to engage in waste reduction, recycling, and reuse (Hansla et al., 2008).

By reviewing a large number of articles in the field of waste management, it is found that the VBN theory has been widely applied to understand waste minimisation behaviours, including recycling, composting, and reducing single-use plastics, etc. For instance, when individuals perceive environmental damage from excessive waste, such as pollution or landfill overflow, they are more prone to take preventive actions (Chen & Tung, 2010). Moreover, people who feel personally responsible for their waste generation are more likely to take steps to minimise waste, such as avoiding disposable products or properly sorting recyclables (Vining & Ebreo, 2002).

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

2.4.3 Social Practice Theory (SPT)

This theory was significantly developed by Shove, Pantzar, and Watson (2012). It offers an alternative perspective on understanding individuals' behaviour. Unlike behaviourist or individualist psychological models, SPT shifts the focus from individuals' attitudes, values, and intentions to practices as the central unit of analysis. This theory emphasises that behaviours are not isolated decisions but rather embedded in the social, cultural, and material context in which they occur. From the perspective of waste management, SPT emphasises the role of everyday practices and routines in shaping waste-related behaviours. (Nguyen et al., 2023). This perspective highlights how societal norms, cultural contexts, and material infrastructures influence individual actions (Shove et al., 2012). For example, the availability of recycling bins and public campaigns can normalise waste separation practices.

3. Research Method

Due to the rapid growth of literature data, the review has been limited to focus on OECD nations and to examine publications in the English language, which is the most relevant language in line with the study objectives. And under this premise, the scope of the review spans the last ten years. Through the searching process, a wide range of "waste minimisation behaviours" were explored. To align with the study's objectives, waste minimisation behaviour in this article refers to the individual activities of waste prevention and waste reduction, such as conscientious purchasing and consumption, waste sorting, recycling, composting, reusing, repairing items, and donating used goods. In relation to these individual behaviours, psychological and situational factors identified in selected literature are to be reviewed and communicated in the findings section.

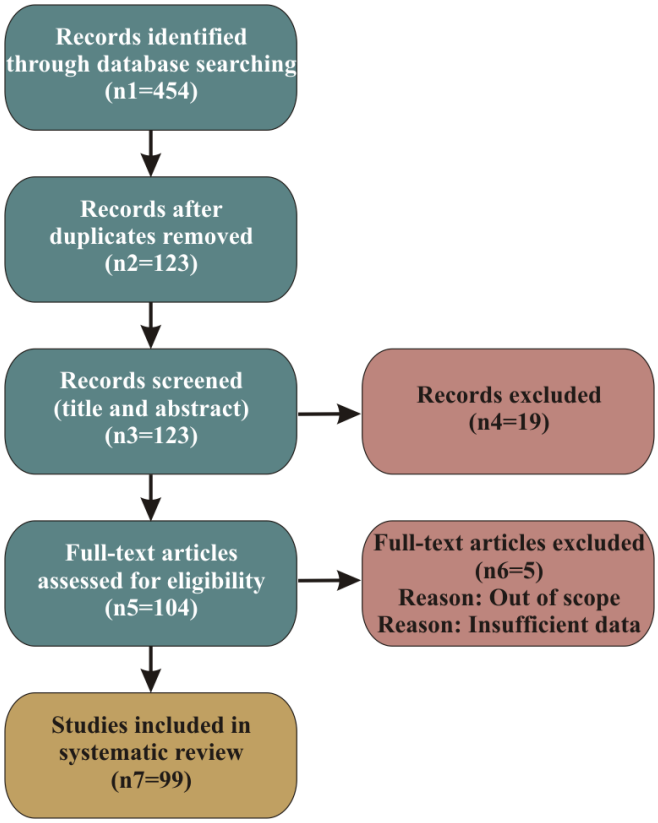
This study adopts a systematic literature review approach to identify and analyse common factors influencing waste minimisation behaviour in OECD countries. Systematic reviews are characterised by a transparent, reproducible methodology designed to minimise bias by following a structured protocol. The study involved a comprehensive search across multiple scientific and academic database platforms, including WoS, Scopus, and Google Scholar. Articles published in English within the past ten years were selected, duplicates and irrelevant studies were removed manually. Both quantitative and qualitative studies were included to ensure a balanced understanding of the factors influencing waste minimisation behaviour. The selected literature was analysed thematically, and findings were categorised into five main factor groups for clarity and comparability.

The thematic coding process was conducted manually, utilising Excel spreadsheets for assistance. Each article was reviewed for relevant factors, which were then coded into one or more of the five established categories (A-E). To ensure consistency, two rounds of coding were performed, with cross-checking to minimise bias.

To enhance transparency, the article selection process is summarised in a PRISMA-style flow diagram (Figure 3-1), which illustrates the stages of identification, screening, eligibility, and inclusion.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Figure 3-1. Selection Process (PRISMA flow chart)



(Source: Generated by the authors, following PRISMA 2020 guidelines)

3.1 The Search

A comprehensive literature search was conducted to identify articles related to the topic. A large volume of studies from widely used scientific databases was reached and extracted. The Boolean operators were applied in keyword strings. The keyword set was ("factor" or "influence" or "affect") and ("waste behaviour" or "waste minimisation "behaviour or "waste reduction behaviour") and "OECD". The filter settings for searching and further screening eligibility were: (a) Articles dated between 2015 and 2024; (b) English language only; and (c) Searching in entire articles. All search results from the selected databases were combined to form the total search records. Through the specialised country/region filter on the Scopus database, more accurate results for OECD countries were achieved.

The examined articles in this study were classified according to various criteria. These criteria include year of publication, number of authors, journal index type (in the WoS Core Collection), type of literature, research approach, and factors group (Table 3-1).

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 3-1 Analysis, Classification and Coding for Scientific Studies

Criterion Quantity	Coding
Year of Publication	2015, 2016... 2024
Number of Authors	1,2,3,4,5,6 or more
WoS Core Collection	SCI-EX, SSCI, A&HCI, ESCI
Type of Article	Rh= Research article Rw= Review article Ce= Conference paper
Research Approach	Quantitative, Qualitative, Mixed-Methods
Review Type	Narrative Review, Systematic Review, Meta-Analysis, Meta-Synthesis, Scoping Review, Umbrella Review, Integrative Review
Factors Group	A= Individual Factors B= Social / Collective Factors C= Economic Factors D= Administrative / Interventional Factors E= Media / Technology Factors

Source: Prepared by the authors

3.2 Statistics on Literature Entries

The screening and careful selection were carried out manually by deduplicating and excluding irrelevant articles. In this process, Google Scholar accounted for over 50% of the total result counts of 454 items (n = n1). However, the proportion of eligible articles dramatically dropped to only 8% of the total selected article counts due to duplication and other exclusion criteria. In contrast, Scopus had a low exclusion rate and provided 83 (weighed 84%) eligible articles in this study. As a complementary source, the WoS platform provided 31 items during the initial search. After the deduplication and exclusion process, 8 items (weighing 8%) remained as eligible. The records are as shown in the table below (see Table 3-2). The eligible articles were downloaded from databases via the DOI links provided by the search engines for in-depth review. The final record was n=99. The work of quantitative and qualitative analysis was then performed.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 3-2. Distribution of articles by data source

Data Source	WoS	Scopus	Google Scholar	Total
Initial Search Results (n0)	31	169	254	454
Eligible Articles (n)	8	83	8	99
% out of n (n=99)	8%	84%	8%	100%

Source: Prepared by the authors

Table 3-3. Distribution of Articles by Year of Publication

Year	Quantity	Percentage
2015	0	0.00%
2016	3	3.03%
2017	3	3.03%
2018	7	7.07%
2019	11	11.11%
2020	11	11.11%
2021	14	14.14%
2022	14	14.14%
2023	16	16.16%
2024	20	20.20%
Total	**99**	**100.00%**

Source: Prepared by the authors

The chronological frequency of reviewed articles by year of publication is shown below (see Table 3-3). Both the quantity and percentage of the total publications across 2015 to 2024 are presented. The data reveals a general upward trend in the number of topic-related articles over the last 10 years. There was no article selected from 2015. In 2016 and 2017, 3 articles for each year were reviewed. With modest growth until 2018, when the quantity rose significantly to 7 articles (7.07%). The upward trend continued, peaking in 2024 with 20 articles, accounting for 20.20% of the total. Overall, the data indicate a consistent growth in topic-related articles over the decade, with a marked acceleration in recent years.

The reviewed articles are categorised by type within the total of 99 articles (see Table 3-4). Research articles dominate the dataset, accounting for 85 articles, which represent 85.86% of the total. Review articles follow, contributing 11 articles, or

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

11.11%. Conference papers comprise the smallest portion, with only three articles, representing 3.03% of the total. This distribution highlights the prominence of research articles in the reviewed literature.

Table 3-4. Literature Type of the Reviewed Articles

Article Type	Quantity	Percentage
Review articles (Rw)	11	11.11%
Research articles (Rh)	85	85.86%
Conference papers (Re)	3	3.03%
Total	**99**	**100.00%**

Source: Prepared by the authors

Table 3-5 below presents the distribution of reviewed articles by journal type in the Web of Science (WoS) Core Collection, showing both quantity and percentage in the table. The majority of the articles, 56 in total (57.58%), were published in SCI-EX journals, reflecting the high concentration of topic-related research. SSCI journals account for 19 articles (19.19%), while ESCI journals contribute 15 articles (15.15%). A smaller portion, 9 articles (10.10%), are published in journals indexed by both SCI-EX and SSCI. Overall, the data highlights a strong presence of SCI-EX journals, with varying but notable contributions from SSCI and ESCI journals.

Table 3-5. Distribution According to WoS Core Collection

Journal Type	Quantity	Percentage
SCI-EX	56	56.57%
SSCI	19	19.19%
A&HCI	0	0.00%
ESCI	15	15.15%
SCI-EX; SSCI	9	9.09%
TOTAL	**99**	**100.00%**

Source: Prepared by the authors

4. Findings and Discussion

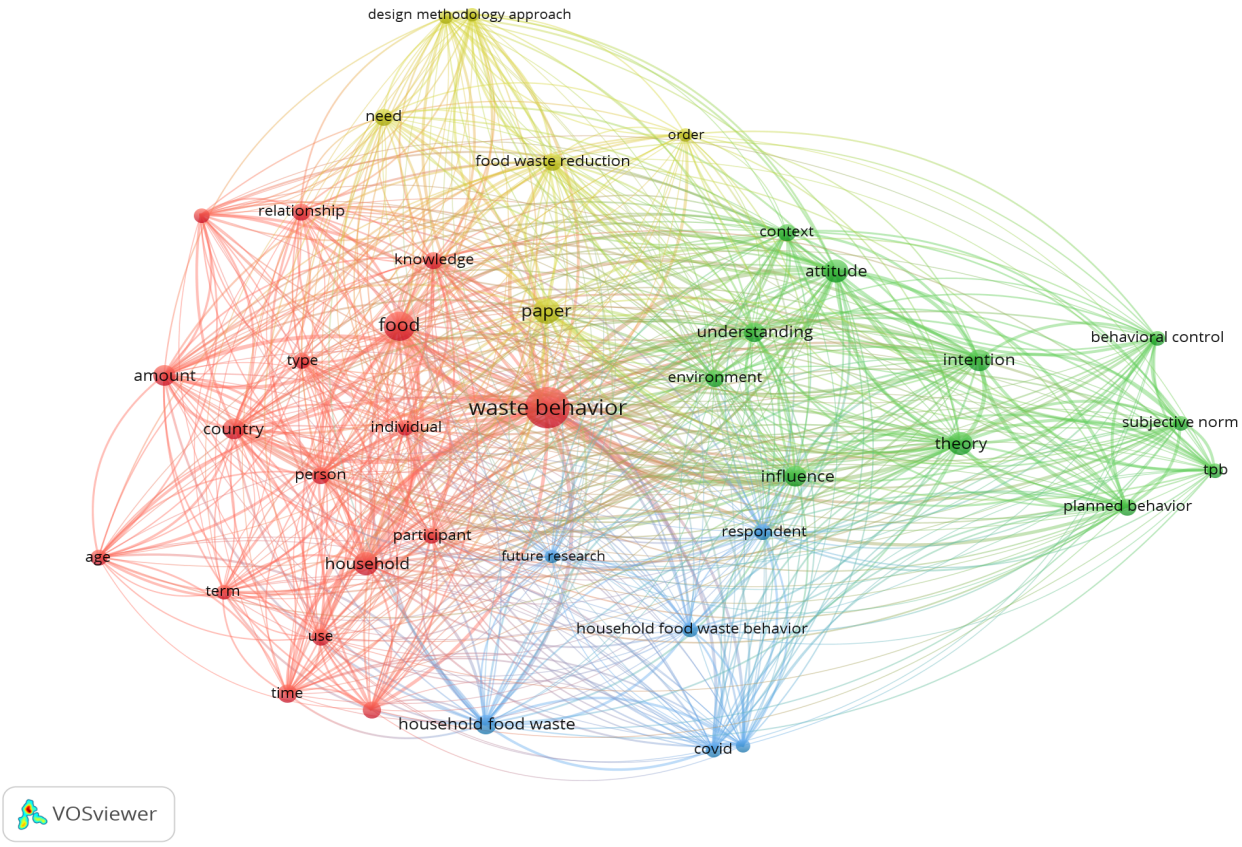
Through a preliminary study using thematic keywords via Google Search, most search results revealed that both psychological and contextual factors have a notable impact on people's waste-related behaviours. Furthermore, these intrinsic factors appear to be attracting more interest from researchers in recent years. In this study, individual behaviours and relevant factors

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

influencing waste minimisation behaviour were examined. Nevertheless, other variables that occurred in relevant literature sources have also been reviewed and analysed, thus a more holistic view was provided to advance implementations and future studies.

As a reliable and rich data source of literature for this study, Scopus contributes many topic-related articles. One of the initial searches performed in December 2024 on the Scopus platform resulted in 169 articles (before exclusion), containing author-assigned keywords. It is meaningful to observe the linkage among these articles through a visualised analysis approach.

Figure 4-1. The Authors' Keywords Cluster Mapping



Source: Generated by VOSviewer 1.6.20

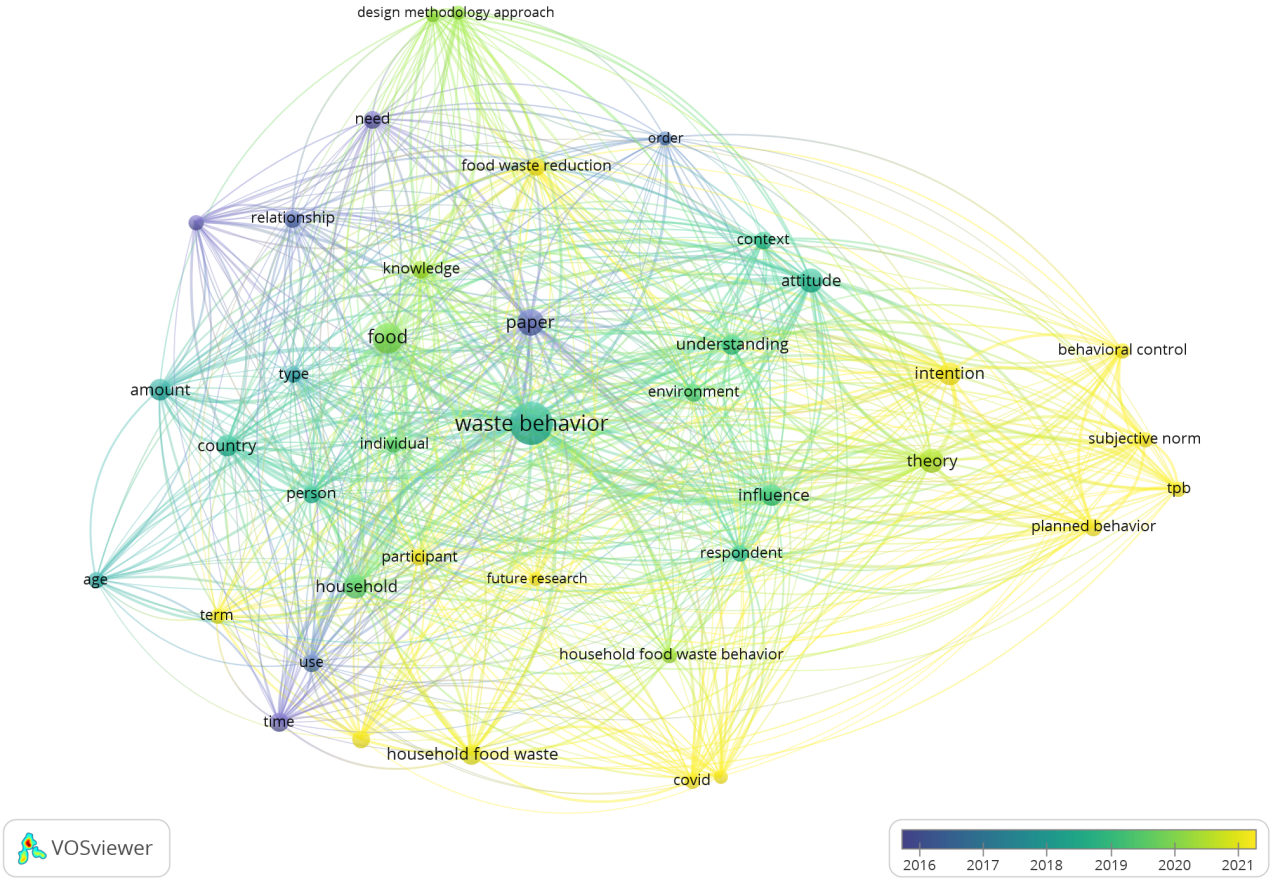
Therefore, VOSviewer was employed for bibliometric mapping. For readers less familiar with bibliometric mapping, the clusters in Figure 4-1 indicate groups of keywords that frequently co-occur in the reviewed literature. The size of each node represents the frequency of a keyword, while the thickness of lines shows the strength of co-occurrence with other terms. This visualisation helps identify dominant themes (e.g., "food waste") as well as underexplored linkages (e.g., between behavioural psychology and economic incentives). The resulting authors' keywords cluster map comprised 36 keywords emerging in the

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

captured articles. It contains four clusters indicated in four colours (resolution in VOSViewer was set to 0.70) and is presented in Figure 4-1.

Based on this visualised network, a chronological mapping was presented by VOSviewer, which indicated the research trend along the timeline. According to the network (Figure 4-2), studies on behavioural factors and COVID-related topics have been emerging and emphasised by researchers in recent years. The linkage between the core theme of "waste behaviour" and other keywords remains highly consistent. There are new trends emerging from each cluster, while "food", "household food waste", and "food waste reduction" take the leading positions in their respective clusters. However, the weak connections between food waste behaviours and the trending behavioural cluster may indicate some research gaps for future studies.

Figure 4-2. Chronological Authors' Keywords Cluster Mapping



Source: Generated by VOSviewer 1.6.20

The findings from the reviewed literature exhibit a multidimensional landscape of factors influencing waste minimisation behaviour in OECD countries. These factors span psychological, social, economic, administrative, and technological

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

dimensions, reflecting the complexity of addressing waste challenges. In particular, individual factors dominate the research focus, emphasising the role of personal attitudes, values, and behavioural habits in waste minimisation. Social and collective factors follow closely, highlighting the importance of social norms, cultural contexts, and community initiatives. In contrast, economic factors and media/technology factors are less frequently studied, despite their growing relevance in modern waste management strategies. This phenomenon may also indicate some research gaps in this particular field. These findings suggest that while individual and social behaviours) are essential drivers, a more integrated approach involving economic incentives, policy interventions, and digital technologies is needed to create lasting change. The influencing factors across the reviewed articles reveal distinct patterns in research focus. Common factors influencing waste minimisation behaviour, summarised from the OECD-related literature, align with the study's title and objectives and are grouped into five categories.

The factors discussed in the reviewed articles are counted and presented in Table 4-1 (see below). Group A (Individual Factors), addressed in 81 articles (81.82% of 99 articles), dominates the findings, emphasising the importance of psychological factors (e.g., attitudes, beliefs, and values), behavioural habits, personal learning and knowledge dissemination (e.g., perception and awareness), and socio-demographic characteristics (e.g., age, education level). This prevalence indicates a strong research focus on understanding how individual-level attributes shape waste minimisation behaviours.

Following this, Group B (Social/Collective Factors) appears in 52 articles (52.53%), highlighting the role of social norms, cultural influences (including religion), community engagement, and situational contexts. These findings suggest that collective social dynamics and cultural contexts significantly influence waste-related behaviours, complementing individual-level factors.

Group D (Administrative / Interventional Factors) is discussed in 46 articles (46.46%), with attention given to policies, regulations, taxation, municipal interventions, public education, and accessibility to recycling and resource recovery facilities. This group underscores the importance of governance, institutional support, and infrastructure in enabling and sustaining waste minimisation efforts.

In contrast, Group C (Economic Factors) is represented in 27 articles (27.27%), focusing on socio-economic status (e.g., income level) and the role of incentives and penalties in driving waste-related behaviours. While economic motivators are recognised as influential, their comparatively lower representation suggests they are viewed as secondary drivers compared to individual and social dimensions.

Lastly, Group E (Media / Technology Factors) is the least addressed, with 7 articles (7.07%) examining the influence of media and digital technology on waste minimisation practices. Despite their growing relevance in contemporary contexts, these factors remain underexplored in the current body of literature.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 4-1. Distribution of Factor Groups in the Analysed Articles

Factors Group	Distribution	% out of 99
Group A (Individual Factors)	81	81.82%
Group B (Social / Collective Factors)	52	52.53%
Group C (Economic Factors)	27	27.27%
Group D (Administrative / Interventional Factors)	46	46.46%
Group E (Media / Technology Factors)	7	7.07%

Source: Prepared by the authors

When viewed through the lens of the circular economy, these factors collectively emphasise the interconnected roles of individuals, communities, institutions, and technology in creating sustainable resource management systems (Geissdoerfer et al., 2017; Kirchherr et al., 2018). Individual behaviours, social norms, and administrative policies are critical drivers in shifting from a linear model to a circular model where waste is minimised, resources are reused, and materials are kept in circulation for as long as possible (Ellen MacArthur Foundation, 2013).

While individual and social factors provide the foundation for behavioural change, economic incentives and technological innovations are essential for scaling and sustaining circular practices (Parajuly et al., 2020; Ghisellini et al., 2016). The limited focus on media and technology factors suggests an untapped opportunity to leverage digital tools and communication platforms in promoting circular economy principles (Cagno et al., 2021). Meanwhile, the moderate emphasis on economic drivers signals the need for more robust financial frameworks and incentives to encourage participation across all levels of society (Su et al., 2013).

Overall, advancing waste minimisation behaviour within a circular economy framework requires a balanced integration of behavioural change, community engagement, administrative support, economic incentives, and technological innovation (Murray et al., 2017). This holistic approach ensures that waste minimisation becomes not just an individual responsibility but a systemic practice embedded across social, economic, and technological dimensions.

The distribution of research methods and review types in the selected literature is presented in Table 4-2. The analysis reveals a dominant reliance on quantitative approaches, which account for 68 articles (68.69%). This significant representation highlights a strong preference for numerical data, statistical analysis, and measurable outcomes in understanding waste-related behaviours.

In contrast, qualitative methods appear in 8 articles (8.08%), focusing on in-depth insights, subjective experiences, and contextual understanding. Meanwhile, mixed-methods (mixed methods?) approaches, combining both quantitative and qualitative techniques, are present in 12 articles (12.12%), reflecting an integrative approach to address complex research questions.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Among the review types, systematic reviews are the most common, appearing in 8 articles (8.08%), followed by a single instance each of narrative review (1.01%), meta-analysis (1.01%), and meta-synthesis (1.01%). Interestingly, there are no studies employing scoping reviews, umbrella reviews, or integrative reviews, indicating a lack of broader synthesis-oriented approaches in the reviewed literature.

In summary, the findings reveal a clear methodological emphasis on quantitative research, complemented by smaller contributions from qualitative and mixed-methods studies. The limited presence of advanced review methodologies suggests an opportunity for future research to incorporate more diverse and comprehensive synthesis approaches to deepen the understanding of waste minimisation behaviour.

Table 4-2. Distribution of Research Method & Type of Review

Research Method / Review Type	Quantity	Percentage
Quantitative	68	68.69%
Qualitative	8	8.08%
Mixed-Methods	12	12.12%
Narrative Review	1	1.01%
Systematic Review	8	8.08%
Meta-Analysis	1	1.01%
Meta-Synthesis	1	1.01%
Scoping Review	0	0.00%
Umbrella Review	0	0.00%
Integrative Review	0	0.00%
Total	**99**	**100.00%**

Source: Prepared by the authors

5. Conclusion

Several research gaps are identified in this review, specifically that economic and technological factors remain underexplored, particularly in terms of their integration into behavioural interventions. Future research should also focus on cross-factor interactions, such as how administrative policies influence individual behaviours, what interventions can be implemented through digital and artificial intelligence technology, or how social norms interact with economic incentives. Furthermore, cross-cultural comparative work and longitudinal studies tracking behavioural changes over time could provide deeper insights into the effectiveness of waste minimisation strategies. Addressing these gaps will contribute to more holistic and effective

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

waste management frameworks in OECD countries. Additionally, future research should account for the lasting impacts of the COVID-19 pandemic on waste-related behaviours and explore how resilience and adaptability can be built into waste management systems to better withstand similar disruptions in the future.

In summary, this review highlights the need for OECD policymakers to adopt integrated waste minimisation strategies that combine behavioural, social, economic, and technological approaches. By explicitly addressing underexplored factors such as financial incentives and digital technologies, future interventions can better align with circular economy goals and accelerate sustainable transitions.

5.1 Limitation

While this review provides valuable insights into the factors influencing waste minimisation behaviour in OECD countries, it has several limitations. Firstly, the analysis relies heavily on secondary data from published studies, which may introduce publication bias. Secondly, the focus on articles published only in English excludes potentially relevant research in other languages. Thirdly, the emphasis on OECD countries limits the generalizability of findings to non-OECD contexts, where waste management dynamics might differ. Lastly, while the study categorises factors systematically, interactions and overlaps between these factors (e.g., individual attitudes and social norms) were not deeply explored, which could limit the holistic understanding of behavioural drivers.

Additionally, the impact of the COVID-19 pandemic on waste minimisation behaviour is unignorable. The pandemic disrupted established waste management systems, altered consumption patterns, and increased reliance on single-use plastics and packaging materials due to concerns over health and safety. For instance, the surge in demand for personal protective equipment (PPE) and disposable items led to a notable rise in plastic waste, exacerbating environmental challenges (Rivas et al., 2022). Lockdowns and restrictions also limited public participation in recycling programs and community initiatives, further hindering waste minimisation efforts (Luhar et al., 2022). However, some unexpected positive impacts were also confirmed, including that more careful food planning and consumption led to a reduction in food wastage during the pandemic (Principato et al., 2020). Furthermore, studies conducted during and after the pandemic may reflect temporary behavioural shifts rather than long-term trends, which could skew interpretations of factors influencing waste minimisation. These pandemic-related factors were not classified as an extra factor group in this review.

5.2 Implication

The findings carry direct policy relevance. OECD governments can design integrated strategies that combine behavioural insights with economic and technological levers. For instance, pairing recycling infrastructure with financial incentives (such as PAYT schemes) can overcome behavioural inertia, while digital apps for household waste tracking can complement education campaigns (Svatikova et al., 2025; Trupti, 2025). Linking these findings to policy shows that effective waste minimisation requires not only awareness and infrastructure, but also well-calibrated incentive structures and digital innovations.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

The findings of this study have significant implications for both policy and practice in waste minimisation. Policymakers can leverage the Theory of Planned Behaviour (TPB) to design campaigns that enhance positive attitudes toward waste minimisation and address perceived barriers, such as limited recycling infrastructure. Similarly, the Value-Belief-Norm (VBN) theory highlights the importance of cultivating environmental values and moral responsibility among citizens. Social Practice Theory (SPT) underscores the role of structural and cultural contexts in shaping daily waste behaviour, emphasising the need for community-level interventions and infrastructure improvements.

From an economic perspective, incentives such as tax breaks for sustainable practices and penalties for non-compliance could drive behavioural change. Technological innovations, including digital waste tracking tools and AI-based waste sorting systems, offer opportunities for scaling up waste minimisation efforts. These insights suggest a multi-layered approach where behavioural, cultural, economic, and technological interventions are integrated to achieve long-term sustainability goals.

5.3 Insights from The Study

This study highlights several critical insights into waste minimisation behaviour within the OECD community:

1) Dominance of Individual Factors: Psychological factors such as attitudes, perceived control, and environmental values play a central role in influencing waste minimisation behaviour.

2) Social and Cultural Influence: Collective factors, including social norms and community engagement, amplify individual efforts and create an enabling environment for waste minimisation.

3) Policy and Infrastructure: Effective waste management policies, accessible recycling systems, and administrative support are essential enablers of sustainable behaviours.

4) Underexplored Economic and Technological Dimensions: Despite their potential, economic incentives and technological advancements remain underutilised in existing strategies.

5) Need for Integrated Approaches: A holistic approach combining behavioural science, social infrastructure, policy enforcement, and technological innovation is essential for addressing the complexity of waste minimisation.

Another key insight from the study is the prominent focus on food waste, with 66 out of 99 reviewed articles (67%) addressing this issue. This finding highlights the crucial importance of reducing food waste as part of broader waste minimisation strategies. Tackling food waste aligns with multiple sustainability goals, including reducing greenhouse gas emissions, improving resource efficiency, and addressing food insecurity. This research suggests that targeted strategies, such as food waste collection services, composting programs, awareness campaigns, and supply chain optimisations, can yield significant environmental and social benefits from food waste reduction alone.

CONFLICT OF INTEREST

The authors declare that they have no financial, institutional, or personal conflicts of interest that could have influenced the research presented in this paper. This study received no external funding. All data and materials used in this study were obtained from publicly available sources, and no proprietary interests are involved.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics, 95*(9-10), 1082-1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Alves, B. (2024, November 6). Global waste generation - Statistics & facts. *Statista.* Retrieved from https://www.statista.com/topics/4983/waste-generation-worldwide/#topicOverview

Alves, B. (2025, March 27). Global waste generation - Statistics & facts. *Statista.* Retrieved from https://www.statista.com/topics/4983/waste-generation-worldwide/#topicOverview

Barr, S. (2007). Factors influencing environmental attitudes and behaviors: A UK case study of household waste management. *Environment and Behavior, 39*(4), 435-473. https://doi.org/10.1177/0013916505283421

Cagno, E., Neri, A., Negri, M., Bassani, C. A., & Lampertico, T. (2021). The Role of Digital Technologies in Operationalizing the Circular Economy Transition: A Systematic Literature Review. *Applied Sciences, 11*(8), 3328. https://doi.org/10.3390/app11083328

Campana, P., Censi, R., Tarola, A. M., & Ruggieri, R. (2025). Artificial Intelligence and Digital Twins for Sustainable Waste Management: A Bibliometric and Thematic Review. *Applied Sciences, 15*(11), 6337. https://doi.org/10.3390/app15116337

Chen, M. F., & Tung, P. J. (2009). The moderating effect of perceived lack of facilities on consumers' recycling intentions. *Environment and Behavior, 42*(7), 824-844. https://doi.org/10.1177/0013916509352833

Cheremisinoff, N. P. (2003). *Handbook of solid waste management and minimization technologies.* Butterworth-Heinemann. ISBN-13: 978-0750675073.

Ellen MacArthur Foundation. (2013). *Towards the circular economy: Economic and business rationale for an accelerated transition.* Ellen MacArthur Foundation.

Ellen MacArthur Foundation. (2019, September 16). *The Circular Economy in Detail*.Retrieved from https://www.ellenmacarthurfoundation.org

Envac Group. (2024 June). *Tackling food waste: South Korea's success story*. Retrieved from https://www.envacgroup.com/insights/tackling-food-waste-south-koreas-success-story/

Environmental Protection Agency (EPA) of the United States. (2025, May 2). *Energy Recovery from the Combustion of Municipal Solid Waste (MSW)*. Retrieved from https://www.epa.gov

Ertz, M., Karakas, F., & Sarigöllü, E. (2016). Exploring pro-environmental behaviors of consumers: An analysis of contextual factors, attitude, and behaviors. *Journal of Business Research, 69*(10), 3971-3980. https://doi.org/10.1016/j.jbusres.2016.06.010

Ertz, M., & Patrick, P. (2019). The future of sustainable consumption: A circular economy with behavioral insights. In M. Brandão, D. Lazarevic, & G. Finnveden (Eds.), *Handbook of the Circular Economy* (pp. 474–486). Edward Elgar Publishing. https://doi.org/10.4337/9781788972728.00043

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Ertz, M., Favier, R., Robinot, É., & Sun, S. (2021). To waste or not to waste? Empirical study of waste minimization behavior. *Waste Management, 131*, 443-452. https://doi.org/10.1016/j.wasman.2021.06.032

Etim, E., Choedron, K. T., Ajai, O., Duke, O., & Jijingi, H. E. (2025). Systematic review of factors influencing household food waste behaviour: Applying the theory of planned behaviour. *Waste Management & Research, 43*(6), 803-827.

European Commission. (2008). *Directive 2008/98/EC on waste (Waste Framework Directive)*. Retrieved from https://eur-lex.europa.eu

European Commission. (2020). *Circular economy action plan: For a cleaner and more competitive Europe.* Retrieved from https://ec.europa.eu

Evans, D. (2012). Beyond the throwaway society: Ordinary domestic practice and a sociological approach to household food waste. *Sociology, 46*(1), 41–56. https://doi.org/10.1177/0038038511416150

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy - A new sustainability paradigm? *Journal of Cleaner Production, 143*, 757-768. https://doi.org/10.1016/j.jclepro.2016.12.048

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production, 114*, 11-32. https://doi.org/10.1016/j.jclepro.2015.09.007

Grant, J. (2025). *Wasted Value: Exploring Participant Narratives of Informal Waste Collection and Recycling in Sydney, Australia Through Design-Based Activism* (Doctoral dissertation, University of New South Wales, Australia).

Hage, O., Söderholm, P., & Berglund, C. (2009). Normative beliefs and recycling: Evidence from Sweden. *Resources, Conservation and Recycling, 53*(3), 155-162. https://doi.org/10.1016/j.resconrec.2008.11.003

Handbook Germany. (2022). *Waste Separation and Recycling in Germany.* Retrieved from https://handbookgermany.de

Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture, 11*(1), 79–99. https://doi.org/10.1177/1469540510390500

Hasan, S. (2004b). Public awareness is key to successful waste management. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances and Environmental Engineering, 39*, 483–492. https://doi.org/10.1081/ESE-120027539

Hansla, A., Gamble, A., Juliusson, A., & Gärling, T. (2008). The relationships between awareness of consequences, environmental concern, and value orientations. *Journal of Environmental Psychology, 28*(1), 1–9. https://doi.org/10.1016/j.jenvp.2007.08.004

Hornik, J., Cherian, J., Madansky, M., & Narayana, C. (1995). Determinants of recycling behavior: A synthesis of research results. *Journal of Socio-Economics, 24*(1), 105-127. https://doi.org/10.1016/1053-5357(95)90032-2

Kaza, S., Yao, L., Bhada-Tata, P., & Van Woerden, F. (2018). *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. World Bank.

Kirchherr, J., Reike, D., & Hekkert, M. (2018). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling, 127*, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Lee, S. H., & Paik, H. S. (2011). Korean household waste management and recycling behavior. *Building and Environment,*

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

46(5), 1159-1166. https://doi.org/10.1016/j.buildenv.2010.12.005

Lisciani, S., Camilli, E., & Marconi, S. (2024). Enhancing food and nutrition literacy: A key strategy for reducing food waste and improving diet quality. *Sustainability, 16*(5), 1726.

Luhar, I., Luhar, S., & Abdullah, M. M. A. B. (2022). Challenges and Impacts of COVID-19 Pandemic on Global Waste Management Systems: A Review. *Journal of Composites Science, 6*(9), 271. https://doi.org/10.3390/jcs6090271

Maibach, E. (2019). Increasing public awareness and facilitating behavior change: Two guiding heuristics. In *Biodiversity and Climate Change* (pp. 336-346). Yale University Press. ISBN 0300241194.

Mazzanti, M., & Zoboli, R. (2008). Waste generation, waste disposal, and policy effectiveness: Evidence on decoupling from the European Union. *Resources, Conservation and Recycling, 52*(10), 1221-1234. https://doi.org/10.1016/j.resconrec.2008.07.003

Melikoglu, M., Lin, C. S. K., & Webb, C. (2013). Analysing global food waste problem: Pinpointing the facts and estimating the energy content. *Central European Journal of Engineering, 3*, 157-164. https://doi.org/10.2478/s13531-012-0058-5

Moshkal, M., Akhapov, Y., & Ogihara, A. (2024). Sustainable Waste Management in Japan: Challenges, Achievements, and Future Prospects: A Review. *Sustainability, 16*(17), 7347. https://doi.org/10.3390/su16177347

Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics, 140*(3), 369–380. https://doi.org/10.1007/s10551-015-2693-2

Nguyen A.T., Nguyen N., Phung P., Yến-Khanh N., (2023). Residents' waste management practices in a developing country: A social practice theory analysis. *Environmental Challenges, 13*, 100770. https://doi.org/10.1016/j.envc.2023.100770

NZ MoE, Ministry of Environment, New Zealand. (2024, December 18). *Government waste work programme*. Retrieved from https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/work-programme-on-waste/

OECD. (2019a). *Waste management and the circular economy in selected OECD countries: Evidence from environmental performance reviews.* OECD Publishing. https://doi.org/10.1787/9789264309395-en

OECD (2019b), *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*. OECD Publishing. https://doi.org/10.1787/9789264307452-en

OECD. (2021). *The Circular Economy in Cities and Regions: Synthesis Report.* OECD Publishing. https://doi.org/10.1787/10ac6ae4-en

OECD. (2022) *Global Plastics Outlook: Policy Scenarios to 2060*. OECD Publishing. https://doi.org/10.1787/aa1edf33-en

OECD. (2023). *Municipal Waste, Generation and Treatment*. OECD Environment Statistics (database). OECD Publishing. https://doi.org/10.1787/data-00601-en

Parajuly K., Fitzpatrick C., Muldoon O., Kuehr R., (2020). Behavioral change for the circular economy: A review with focus on electronic waste management in the EU. *Conservation & Recycling: X, 6*, 100035. https://doi.org/10.1016/j.rcrx.2020.100035

Pergola, M., Persiani, A., Palese, A. M., Di Meo, V., Pastore, V., D'Adamo, C., & Celano, G. (2018). Composting: The way

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

for a sustainable agriculture. *Applied Soil Ecology, 123*, 744–750. https://doi.org/10.1016/j.apsoil.2017.10.016

Principato, L., Secondi, L., Cicatiello, C., & Mattia, G. (2020). Caring more about food: The unexpected positive effect of the Covid-19 lockdown on household food management and waste. *Socio-Economic Planning Sciences*, 100953. https://doi.org/10.1016/j.seps.2020.100953

Raghu, S. J., & Rodrigues, L. L. R. (2020). Behavioral aspects of solid waste management: A systematic review. *Journal of the Air & Waste Management Association*, *70*(12), 1268-1302. https://doi.org/10.1080/10962247.2020.1823524

Rahman, T., Deb, N., Alam, M. Z., Moniruzzaman, M., Miah, M. S., Horaira, M. A., & Kamal, R. (2024). Navigating the contemporary landscape of food waste management in developing countries: A comprehensive overview and prospective analysis. *Heliyon, 10*(12), e33218. https://doi.org/10.1016/j.heliyon.2024.e33218

Rivas, M. L., Albion, I., Bernal, B., Handcock, R. N., Heatwole, S. J., Parrott, M. L., Piazza, K. A., & Deschaseaux, E. (2022). The plastic pandemic: COVID-19 has accelerated plastic pollution, but there is a cure. *The Science of the total environment*, *847*, 157555. https://doi.org/10.1016/j.scitotenv.2022.157555

Saxena, Y. K. (2024). Waste minimization at source. In Arya, R. K., Verros, G. D., Verma, O. P., & Hussain, C. M. (Eds.), *From waste to wealth* (pp. 71–84). Springer, Singapore. https://doi.org/10.1007/978-981-99-7552-5_4

Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franěk, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology, 36*(4), 457-475. https://doi.org/10.1177/0022022105275962

Schultz, P.W. (2014). Strategies for promoting proenvironmental behavior. *European Psychologist, 19*(2), 107-117. https://doi.org/10.1027/1016-9040/a000163

Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes.* Sage Publications. https://doi.org/10.4135/9781446250655

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Huxley College on the Peninsulas Publications. 1.* https://cedar.wwu.edu/hcop_facpubs/1

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56*(3), 407–424. https://doi.org/10.1111/0022-4537.00175

Strydom W.F., (2918). Applying the Theory of Planned Behavior to Recycling Behavior in South Africa. *Recycling, 3*(3):43. https://doi.org/10.3390/recycling3030043

Su, B., Heshmati, A., Geng, Y., & Yu, X. (2013). A review of the circular economy in China: Moving from rhetoric to implementation. *Journal of Cleaner Production*, *42*, 215-227. https://doi.org/10.1016/j.jclepro.2012.11.020

Svatikova, K., Brown, A., & Börkey, P. (2025). *Economic instruments for a resource-efficient circular economy* (257th ed., OECD Environment Working Papers) [OECD Environment Working Papers]. https://doi.org/10.1787/35a7051a-en

Taylor, S., & Todd, P. (1995). An Integrated Model of Waste Management Behavior: A Test of Household Recycling and Composting Intentions. *Environment and Behavior, 27*(5), 603-630. https://doi.org/10.1177/0013916595275001

Tiffany M.W. Mak, Iris K.M. Yu, Daniel C.W. Tsang. (2020). Chapter 9 - Theory of planned behavior on food waste

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

recycling. In Thallada B., Ashok P., Eldon R. Rene, Daniel C.W. Tsang (Eds), *Waste Biorefinery*. Elsevier, (pp. 221-239). ISBN 9780128182284. https://doi.org/10.1016/B978-0-12-818228-4.00009-5

Trupti Lotlikar. (2025). WasteWise: A Mobile Application Framework for Enhancing Household Waste Management and Environmental Impact Awareness. *Journal of Information Systems Engineering and Management, 10*(49s), 1319–1329. https://doi.org/10.52783/jisem.v10i49s.10188

Venghaus, S., Henseleit, M., & Belka, M. (2022). The impact of climate change awareness on behavioral changes in Germany: Changing minds or changing behavior? *Energy, Sustainability and Society, 12*, 8. https://doi.org/10.1186/s13705-022-00334-8

Vining, J., & Ebreo, A. (2002). Emerging theoretical and methodological perspectives on conservation behavior. In Bechtel R.B. and Churchman A. (Eds), *Handbook of Environmental Psychology*, (pp. 541–558). Wiley. ISBN-10: 0471405949.

Wilson, B. M., Delmas, M. A., & Rajagopal, D. (2025). Behavioral interventions for waste reduction: A systematic review of experimental studies. *Frontiers in Psychology, 16*, 1561467. https://doi.org/10.3389/fpsyg.2025.1561467

World Bank. (2018). Trends in solid waste management. Retrieved from https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Yin, Y., Yang, C., Li, M., Zheng, Y., Ge, C., Gu, J., Li, H., Duan, M., Wang, X., & Chen, R. (2021). Research progress and prospects for using biochar to mitigate greenhouse gas emissions during composting: A review. *Science of The Total Environment, 798*, 149294. https://doi.org/10.1016/j.scitotenv.2021.149294

Zacho KO, Mosgaard MA. (2016). Understanding the role of waste prevention in local waste management: A literature review. *Waste Management & Research. 34*(10), 980-994. https://doi.org/10.1177/0734242X16652958

Zero Waste Europe. (2020). *The waste hierarchy as a tool for sustainability.* Retrieved from https://zerowasteeurope.eu

Zhang, B., Lai, K. H., Wang, B., & Wang, Z. (2019). From intention to action: How do personal norms affect household waste sorting behavior? *Journal of Environmental Management, 233,* 447–458. https://doi.org/10.1016/j.jenvman.2018.12.059

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/11971 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

European Journal of Social Impact and Circular Economy

UNIVERSITÀ DI TORINO

Organising the Smart Future of Living and Mobility: A Welfare Paradox

Giuseppe Modarelli[1*], Stefano Amelio[2], Andrea Fontanella[3], Valerio Brescia[4]

[1]Department of Management, University of Turin – Italy

Mail giuseppe.modarelli@unito.it

*contact author

ORCID 0000-0003-3561-2931

[2]Department of Economics, University of Insubria – Italy

Mail stefano.amelio@uninsubria.it

ORCID 0000-0002-6472-365X

[3]Department of Historical Studies "Federico Chabod", University of Milan – Italy

Mail andrea.fontanella@unimi.it

ORCID 0000-0001-8173-4716

[4]Department of Economics, Management and Quantitative Methods – Italy

Mail valerio.brescia@unimi.it

ORCID 0000-0001-7919-5370

Received: 03/09/2025
Accepted for publication: 10/12/2025
Published: 29/12/2025

Abstract

The research aims to critically examine the renewed Italian regulations on fringe benefits for mixed-use company cars, which came into force in 2025, with a specific focus on the implications for social equity and the transition to electric mobility. The main objective is to highlight the potential disparities in treatment between electric, hybrid and combustion vehicles, as well as the existence of welfare paradoxes. In fact, the primary aim is to analyse the potential paradox of an incentive policy for sustainable mobility that, through the reduction of taxation on company electric vehicles, may inadvertently exacerbate social and economic inequalities. The research is based on a critical perspective of social functionalism, highlighting how the persistence of paradigms of unequal distribution of benefits can be legitimised by policies that incentivise logics of position and social status. The research adopts a mixed methodological approach, based on a field analysis managed by questionnaires and interviews (181 respondents). The authors offer policymakers insights into the dynamics that condition the electric transition, implemented through regulatory incentives, highlighting the risk of generating social frictions and welfare paradoxes.

The results of the analysis highlight an unequal treatment that considerably favours electric vehicles, potentially creating a double advantage for high-income individuals and organisations. This could lead to a regulatory imbalance that manipulates the situation in the automotive market, also hindering a fair requalification of company car fleets.

Keywords: Fringe benefit, Welfare paradox, Organisational living, Smart mobility, Sustainability, Taxation

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

1. Introduction

Climate change is one of the most significant challenges facing all countries (Hallegatte et al., 2016) due to its impact on the environment, society, and economy. The anthropogenic element in this emergency is recognised not only by the scientific community but also by organisations, governments and society (Stern & Kaufmann, 2014), with some areas being particularly critical.

The emergency has placed the issues of sustainability and sustainable development in a position of prime importance. Since human activities predominantly take place in cities, the issue of sustainable urbanisation (Modarelli et al., 2024) and its development also gain importance. In this context, the "smart city" concept proposes the evolution of the urban environment to improve the quality of life for citizens through increased environmental awareness. This objective is pursued by proposing a more environmentally sustainable approach to public spaces, public services, and both urban and private construction (Bonomi & Masiero, 2014). Regarding the urban environment and its criticality in the context of the climate emergency, the role of mobility stands out, as it is considered one of the main contributors to climate change due to its impact on air pollution, greenhouse gases, and CO2 emissions (Vagnoni & Moradi, 2018). In fact, even if it is possible to say urban mobility is a crucial part of the good functioning of a city's life (Faria et al., 2017; Wawer et al., 2022; Vătămănescu et al., 2023), it is also critical for human health not only because of the climate emergency, but also because of traffic and noise pollution (Curtale et al., 2021; Secinaro, Brescia, Calandra & Biancone, 2021). One of the most pressing issues associated with mobility is pollution. According to the European Environment Agency, in 2022, the transport sector (Chmet et al., 2024) that emits the most CO2 into the air (71%) is road transport, and cars are the subcategory that contributes the most to this negative value (60%). Inevitably, this has an impact on cities, which have a high concentration of cars. Currently, most of the public and private transport vehicles are fitted with fossil-fuelled internal combustion engines, despite the steadily increasing sales of hybrid (mild hybrid and full hybrid) and electric vehicles. This trend is partly attributable to heightened consumer awareness and sensitivity towards environmental issues and the fight against climate change. According to the Global EV Outlook 2024 (GEVO-2024)[1], sales of electric cars in 2023 are expected to rise by 35% compared to 2022, bringing the total number of these vehicles on the road worldwide to 40 million.

In fact, national and supranational bodies (especially the EU) have also contributed by enacting laws and guidelines that clearly indicate the direction to follow. For example, the EU has set ambitious targets of CO2 reduction to be reached by 2030 (Isetti et al., 2020) and, consequently, enacted a regulation mandating zero pollutant emissions from vehicles by 2035, imposing radical short-term changes on both consumers and organisations (Brescia, Degregori, Maggi & Hadro, 2023). Mobility's reaction to climate change involves not only changing consumer purchasing choices, whether driven by policies or different economic models. Various scholars have generally addressed car sharing and sustainable mobility (Docherty et al., 2018; Vătămănescu et al., 2023; Modarelli et al., 2024) as solutions to improve the quality of people's and city life and to move towards a more environmentally friendly economy (Hamari et al., 2016; Gazzola, 2018; Long & Axsen, 2022) and sustainable cities (Turoń, 2023). Hamari et al. (2016) studied the reward systems toward consumption. However, consumer choice has not

[1] For more information, see: https://iea.blob.core.windows.net/assets/a9e3544b-0b12-4e15-b407-65f5c8ce1b5f/GlobalEVOutlook2024.pdf

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

been the sole factor influencing the increase in sales of electric cars and the subsequent development of sustainable mobility. In this sense, a dual vision is pursued by the authors: (a) that of investigating the organisational modalities of future urban planning in terms of modalities and related policies; (b) that of investigating in depth the policies that would allow an acceleration of electrification, starting from the replacement of company car fleets given as fringe benefits to employees in promiscuous use. This dual dynamic opens the horizon of investigation on different and transversal perspectives of academic interest such as: (i) policy and taxation in reference to electrification; (ii) urban planning and mobility; (iii) workers' incentive system and welfare issues; (iv) perception of individual image and social status; (v) perception of corporate image in terms of sustainability. A notable lack of socio-economic assessment appears to be evident, and as expressed in the literature, a comprehensive sustainability assessment should include social and economic aspects in addition to environmental aspects (Onat & Kucukvar, 2022). The authors have redefined all the previous aspects in a holistic frame attributable to a paradox of the fringe benefits' changed legal declination that would pursue two different perspectives: (a) the forced electrification of company car fleets in Italy and the detriment of even small-displacement internal combustion engines (b) the determination of welfare imbalances that does not take into account the perceived social status.

For this reason, it is necessarily desirable to answer the following research questions:

RQ1: What are the retrospective aspects of the attribution of fringe benefits, sustainability policies and to whom they are attributed in the Italian automotive sector?

RQ2: What are the concrete risks and consequences that hide behind the interpretation and application of the 2025 fringe benefits regulation in Italy?

In these terms, in addition to determining a sort of premium and incentive greater than that recognized, a hidden fallout on the company that could include in sustainability reports the actual re-adaptation of the electric car fleet with an image return, also in this case obscured (Pasternak & Rico, 2008; Li, Wang, Gong & Liu, 2022; Stephenson & Vracheva, 2015. Thus, in the context of fringe benefits, the possibility that sustainability policies and incentives, which do not discriminate by car segment, are also of interest to luxury electric cars, making them receive more incentives than fossil-fuelled city cars, is a concrete risk. In this sense, it is worth noting that the 2025 Italian reference regulation would provide a smaller monetary benefit for electric cars, despite their perceived value being higher in market terms. The attributed comparison is made with petrol engines, which are considered more polluting despite their value, which is indicated as lower. Additionally, the perceived value in terms of image has been taken into account in the analysis. This would mean high-income people, so those who have little need for financial incentives to buy a car would receive, paradoxically, a lower benefit. In this sense, the acceptance of a policy, based on its perceived quality (Grelle & Hofman, 2024), becomes determinant of failure or success and needs to be analytically scrutinised. By analysing this topic, considering what has been stated, the focus of policies on people is fundamental in terms of perception of quality and responsiveness to needs for complete acceptance and positive repercussions in the social context to which it refers.

At the theoretical level, the research could be involved within the literature of inequalities, sociologically aligned and interpreted through the lens of functionalists (Levin, 2004; Davis & Moore, 1945; Tumin,1953), who intend the society to be unequal per

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

se, due to the differences existing in terms of positions and rewards. In light of what has been expressed and the evidence of the paradox that can be explained, a double sword of inequality would be configured in these terms, such that, in addition to receiving a benefit (e.g. a company car for mixed use), taxation (by public policies) would further benefit already prominent positions by acquiring a double or triple benefit: (a) that of the use of the means of transport; (b) that of the image benefit; (c) that of promoting sustainability, all of which is synonymous with exclusivity, both at an individual level and from an organisational point of view, exposing to positive repercussions for social and sustainability balance sheets, perception of solidity etc.

Prior research about sustainable mobility is more concerned about generic characteristics of sustainable mobility, without focusing on dedicated policies and their consequences (Müller, & Siebenhüner, 2007; Banister, 2008; Witt, 2021), on sustainability policies without investigating the consequences on consumers and society (Gallo & Marinelli, 2020) and the effects the implementation of sustainability and incentivisation policies have on the urban environment (Winkler et al., 2023). Moreover, to the best of our knowledge, this should be the first research which analyses the consequences that sustainability (in terms of electrified mobility) and incentivisation policies (of work) have on people and on organisations more than on the urban environment, highlighting potential paradoxes. In addition, it should be the first one to analyse this, focusing on the Italian context, and opening possibilities for comparative and cross-national research.

Therefore, investigating what are the critical issues and the presumable risks of a regulatory policy that is misaligned with holistic sustainability objectives is found in the study a critical analysis, on the one hand highlighting a misalignment of the regulations with respect to the actual benefits, on the other hand a basic paucity in determining a mass electrified transaction for companies, which would benefit in terms of image.

This paper is structured as follows: The next section 2 provides background on the concepts of smart cities and smart mobility, linking paradoxes in policy actions. Section 3 refers to the theoretical aspects of social functionalism. Section 4 illustrates the methodological approach employed. The results are described and contextualised within the scientific literature in section 5, which highlights the paradox of smart mobility incentives and welfare. Section 6 delivers a critical discussion of the results obtained, while Section 7 concludes the research by summarising the research steps and main themes of the paper, as well as framing limitations and proposing suggestions for future research.

2. Background

2.1. Smart city and smart mobility: a future between welfare and sustainability policy-driven paradoxes

The Fordist and Taylorist paradigms, which dominated 20th-century cultures, are giving way to a new period in the 21st century (Williams, 2003; Crowley, Tope, Chamberlain & Hodson, 2010), thanks to the digital revolution (Pedersen & Wilkinson, 2018), the information economy (Porat, 2009) and VUCA-D society (Modarelli, 2025). Mass industrial output and a standardised labour force have historically driven the economy, serving as a cornerstone of the conventional welfare dynamic. The modern environment, on the other hand, places a strong emphasis on innovation and the utilisation of digital information as the primary economic drivers, significantly modifying the institutional, personal and organisational dimensions of living. Crucial pillars of

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

the welfare scenario appear to be rooted in the past. While a renewed interest in re-shaping organisational and individual living, thinking at a "smartness" perspective (i.e. "smart cities", "smart services", "smart communication", "smart mobility", etc.) (Modarelli et al., 2024; Vătămănescu et al., 2023; Secinaro et al., 2021) toward a sustainable future, adheres to the foundational elements of welfare to mitigate immanent imbalances. New policies and the challenges of production outputs shape human living styles, habits, and behaviours, often without aligning with the timing and conscious preparation necessary for the welcome and acceptance of innovation (Grelle & Hofmann, 2024). In this way, antiquated paradigms persist within the welfare area. Anchorage to the past seems disproportionate in terms of future sustainable evolution. Policies and mindsets are often misled due to the heterogeneity of the ends. This discrepancy seems to be strictly related to a lack of welfare adaptation. Urban living, organisational settings and personal habits concur with well-being in the era of "smartness", and welfare is one of the main challenges, posing serious problems for developed nations and prompting urgent calls for reforms to bring social benefits into line with current socio-economic reality. The rapid urbanisation and the subsequent challenges faced by metropolitan areas necessitate a paradigm shift towards "intelligent" urban governance. This transformation is driven by the imperative to enhance the quality of life, addressing pivotal concerns such as mobility (Modarelli et al., 2024). On the contrary, the transformation towards improving the quality of urban life, in addition to being a question of mobility, also involves the dimension of consumption. In fact, consumers are also primarily mobile workers, who often travel with their own means of transportation. Therefore, although new alternative methods of purchasing are emerging, the prospect of car ownership is a significant dimension, especially in Italy (Modarelli et al., 2024). In this regard, it is necessary to consider the dynamics of evolution towards the electric transition, which is increasingly encroaching on European territory, also due to the SDGs. If, on the one hand, the urban fabric, especially the Italian one, proves to be inclined to evolve towards the so-called smart city (Secinaro et al., 2021), on the other hand, the number of small and rural municipalities, the existence of historic centres in metropolitan cities outline a "smart" perspective only brownfield, greatly limiting the effect produced by smart cities designed as greenfield (Prakash et al., 2016; Borruso & Balletto, 2022). For this reason, one of the levers is precisely the purchase or, at the very least, the use of zero- or low-impact vehicles, which could guarantee a better quality of urban life in terms of sustainable mobility. The effect perceived by the authors is the investigation of the dynamics of policies that promote electrification, with any kind of forcing, in relation to the determination of value and benefit. While vehicle ownership in Italy is still perceived as a form of independence, social status, and self-determination (Modarelli et al., 2024), new alternative forms are considered only to a limited extent. Therefore, the consumerist dimension of vehicle purchases must be taken into deep consideration. Hamari et al. (2016) studied the sharing economy by investigating the role of attitude towards consumption. Gazzola (2018) investigated the role of knowledge management in the sharing economy and analysed its role in different historical periods.

Long & Axsen (2022) investigated the concept of new mobility in Canada. Turoń (2023) investigates the interrelation between smart cities and smart mobility (in particular, car-sharing systems). Such a radical and systemic change incurs high costs for citizens, as it influences their mobility consumption choices. To incentivise and support the transition towards smarter and more environmentally sustainable mobility, government bodies can offer financial incentives to achieve the established goals regarding pollutant emissions and environmental sustainability. These policies provide benefits and advantages for those who

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

buy non-polluting vehicles (including sustainable light mobility, such as bicycles, scooters, etc.), possibly scrapping the polluting ones they already own, and consequently, providing disincentives in continuing pursuing non-desired behaviours (Lindbeck, 1995). The incentivisation policies are mainly geared towards supporting the economically weaker sections of the population, making them able to buy more expensive vehicles, even if of the same segment as those they already have. So-called eco-bonuses are financial incentives aimed at consumers, usually on low to middle incomes, to make it easier for them to scrap their old polluting cars and, at the same time, to buy a new electric or, in any case, less polluting vehicle. These practices aim to pursue the sustainability objectives posed by supranational bodies. What is happening with organisations? What happens when organisations behave in a way that respects sustainability parameters by guaranteeing benefits to their employees? And when this happens within policies that materially underestimate benefits when these reflect sustainable choices? And when these sustainability policies do not consider intangible benefits, such as image?

Precisely on the basis of these questions, the prerogatives of the study reflect an explicit existence in highlighting breaking points and potentially incongruous regulatory requests, which would find themselves pursuing, on the one hand, environmental objectives, on the other, in contrast with social objectives. If on the one hand sustainability is environmental, on the other it is also social and inequality related, therefore, welfare paradoxes are created.

On the individual consumer side, environmental propensity would be boosted by sustainability-driven marketing and sensitisation campaigns. Introducing State bonuses, tax reductions and available access to traffic-limited urban zones are only a few of the benefits for direct consumers. By contrast, introducing bonuses for non-pollutant vehicles also has repercussions in the reality of organizations, especially with regard to initiatives such as fringe benefits to be granted to their employees. Firms do not only offer compensation through wages but also other kinds of benefits, commonly for transport (Van Ommeren et al., 2006), including cars, which can be used promiscuously by employees. These aspects would be carefully taken into consideration with the intangible aspects such as motivation, social status, non-financial reports and image return. Incentivisation policies also act on fringe benefits and can vary from country to country. Focusing on Italy, the government prepares and releases tables showing different tax rates based on vehicle type and fuel type. These rates are used to calculate the correct tax on vehicles provided to employees as fringe benefits. Because of incentivisation (and disincentivising) policies, the rates reflect the tendency to push people to choose an electric car instead of a fossil-fuelled one[2]. Moreover, the cost of all the electric cars is much higher than the same car but fossil-fuelled, making these models particularly expensive even with incentives. If we consider these aspects, it is inevitable to identify, on the Rogers scale (1962), as innovators, early adopters and early majority, a segment of the population capable of spending amounts well above the average possible expenditure for a car. In this regard, specific questions to identify this threshold of perceived expenditure have been included in the field analysis

[2] This situation, in which electric cars, even if classified in the highest segments, are strongly favoured in terms of incentives if compared to fossil-fuelled ones (even those classified in A and B segments). According to Danielis et al. (2020), segments A and B are the most preferred by Italians because they include city cars, small cars in general and familiar cars. However, there are only a few full-electric models in those segments, while the majority are classified in segment C and above. Even if some electric vehicles were added to the segment A and B fleet after Danielis et al.'s research, they still remain a minority if compared to segment C's electric offer. In fact, according to a report realized by Transport & Environment (a European environmentalist organization), European constructors prefer to produce big and expensive cars instead of compact and cheaper models.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

questionnaire. So, even though electric cars are subsidised by large state and non-state incentives, they still represent a dimension of luxury expenditure, decreeing a halo effect on sustainability as a luxury choice.

Here, a welfare paradox is determined, which does not consider the intangible aspects of image fallout, both individual (for the worker) and organisational (for the company that adopts electric mobility solutions). One of the few cross-cutting research studies on the topic discussed by the authors is that of Gutiérrez-i-Puigarnau & Van Ommeren (2011).

2.2. Policy dimension and fringe benefits: the background of a perceived quality for acceptance

The present research, instead, tries to incorporate the elements of work psychology, position and performance-related pay in terms of fringe benefits (e.g., mixed-use company car), dynamically focusing on the phenomenon within the inequality generated by policies towards the extreme perspective of electrification. In this sense, a dimension of critical analysis is proposed, not only by aligning the mainstream narrative on the electrification of mobility and formalising a direct criticism of the construction of rates inherent to the policy in question to determine the value of fringe benefits on mixed-use company cars with a combustion engine or in some way electrified. Social scientists studying labour costs, the labour market, income distribution, class structure, policy and work sociologists have examined fringe benefits from different perspectives (Kristal, Cohen & Mundlak, 2011), but not under the aegis of electrification mantra (Nigro & Policy, 2024; Hertzke, Müller, Schenk & Wu, 2018; Hertzke, Müller & Schenk, 2017). Aiming to furnish a cross-fertile management-sociological study on the causes, distribution and role of fringe benefits (related to mixed-use cars), this research guarantees coverage of sustainable development by the policy-driven labour market, organizational effects and class structure in terms of welfare perceptions.

The concept of sustainable development is more than a single objective, a holistic and comprehensive approach, which must take into account dynamic and different cases and situations. Environmental policies can change individual and group behaviours in terms of responsibility. If the process is extended to organizations, in which individuals carry out their activities, it is presumable that policies can affect the behaviours of these individuals also in terms of organized social agglomeration. In fact, Müller and Siebenhüner (2005) identify policy options to induce responsible behaviours in terms of environmental sustainability, while Grelle and Hofman (2024) have recently provided a clear indication of how policies should be structured to favour their acceptance by the target audiences. Therefore, political innovations, in this sense, aimed at changing organisational behaviours (i.e. corporate sustainable mobility), on the one hand, require individual and subsequently enlarged organisational learning; on the other, they must be built on a basis of perceived quality and utility. In order to provide a clear identification of the political framework of reference, the same perception of quality and utility must be transferred to the taxation details and to the perception of fairness, optimizing tax collection by the taxation policy toward specific objectives (in this case an environmental SDG), in the meanwhile maintaining the equity and justice (Wibowo & Septiari, 2023). With the same tendency to define the impacts of pro-environmental behaviours (Young et al., 2015), within companies, to the same extent, these behaviours have an important impact on the organisational profile as well as on society. Think of the inclusion of responsible environmental practices within sustainability reports, tax relief, and a responsible pro-environmental image

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

externally, which would also be reflected at an individual level on employees with access to electric mobility, for example (Evans et al., 2013; Li, Wang, Gong & Liu, 2022; Graf, 2023).

Firstly, the price of a hybrid or electric car is higher than that of the same fossil-fuelled model; secondly, the price advantage offered by fossil-fuelled cars, even in a higher segment, might push these people towards the purchase of another fossil-fuelled car, thus slowing down the transition to emission-free mobility. In this sense, it appears that sustainability public policies and incentives stress more the final objective (i.e. pro-environmental behaviours) (Müller & Siebenhüner, 2007; Young et al., 2015), influencing the environmentally efficient products (i.e. electric vehicles) (Wibowo & Septiari, 2023), than focusing on people, creating potential paradoxes (Witt, 2021) in terms of welfare and effective results

If we consider all this from a business perspective, countless advantages would outweigh conflicts in the face of potentially valid sustainability policies. In this case, a policy in reference to the fringe benefit of driving an electric car for mixed use could, more or less consciously, benefit companies already capable of providing a fleet of vehicles of this type on two levels, decreeing an image return both individual and organisational. In terms of pro-environmental behaviours, what would not necessarily be dictated by an awareness or driven by truly environmental intentions, but rather distorted in reference to actions of opaque social responsibility, evidenced in intentions of individualistic advantage in favour of an unjustified functionalism in light of heterogenesis of political and regulatory purposes. Here, from this inevitable conflict arises the dynamic of highlighting a paradox, legitimately identified considering the new Italian legislation on fringe benefits and cars for mixed corporate/private use, risking conflicts with one or more of the other SDGs.

2.3. Regulatory context

Employees in higher positions and in structured organisations receive fringe benefits in addition to their normal salary. As a reward or incentive for productivity, these benefits may include products or services that employees may receive for free or at a discounted rate in accordance with collective bargaining agreements or corporate generosity. Fringe benefits have the same legal function as additional salary. Fringe benefits must be appraised for tax purposes to ascertain if they are taxable. They are occasionally fully taxed, taxed at a flat rate, or not taxed at all. The year 2025 represents a pivotal and transformative moment in the landscape of taxation pertaining to fringe benefits, particularly in relation to the provision of company vehicles that are utilised for both professional and personal purposes (promiscuous use or mixed company/private use). The modifications that have been implemented with this new frame are strategically designed to enhance and encourage the shift towards more sustainable modes of transportation and mobility solutions. The most consequential alteration within this legislative reform focuses specifically on the tax implications associated with company cars that are allocated for mixed-use scenarios. Effective as of the first day of January in the year 2025, a distinct and unequivocal differentiation will be established based on the specific type of fuel that powers the vehicle in question. In fact, in the case of vehicles that operate on petrol or diesel fuel, the applicable percentage for the taxation of the fringe benefit will escalate to an elevated rate of 50% of the calculated amount corresponding to 15,000 kilometres, with such calculations being aligned with the standardised tables provided by the Automobile Club of Italy (ACI). Conversely, for vehicles that are exclusively powered by battery-electric technology, there will be a notable

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

reduction in the tax burden, bringing the taxation rate down to a mere 10%. Additionally, for those vehicles classified as plug-in hybrid electric vehicles, the taxation will be established at a rate of 20%, reflecting a moderate stance in comparison to their fully electric counterparts. This nuanced differentiation in tax treatment serves to illuminate the legislator's intention to actively foster and promote the adoption of low-emission vehicles, which is fundamentally aligned with broader objectives related to environmental sustainability and ecological responsibility. The following factors should be considered in addition to the modifications to corporate car taxes, for instance, the new rules will have a big effect on both employers and employees. Businesses will need to carefully assess the tax charges connected with the various vehicle types when determining the makeup of their fleet.

Table I. Data needed for (promiscuous car) fringe benefit calculation in Italy.

Necessary data	**Source**
Vehicle Name	Ex. Model "N" from the Manufacturer or catalogues
Value per Km	Table ACI https://aci.gov.it/servizio/costi-chilometrici-di-esercizio/
CO2 Emissions	Manufacturer data
Matriculation date	From public registers
Taxation percentage (%)	Legal provisions
	-TUIR (Consolidated Law on Income Taxes - Testo Unico delle Imposte sui Redditi), art. 51, c. 4, lett. a): Regulates the calculation of the fringe benefit for mixed use of the car.
	Modified by L.207/2024 art.1 c.4 -Traffic Laws - Codice della Strada, art. 54, co. 1, lett. a), c) e m):
	Defines vehicle categories.
	-Revenue Agency Circulars - Circolari Agenzia delle Entrate No. 326/97 and 1/2007: They provide clarifications on the calculation of the benefit.
	-Ministerial Circular - Circolare Ministeriale 11/E/2007: Clarifies some aspects regarding the recharging of expenses.
	-Budget Bill 2025 - Disegno di legge di Bilancio 2025: Introduces new tax rates for vehicles licensed for mixed use from 1st January 2025.
Benefit calculation FORMULA *15,000 km x (tax %) x (value per km) x 365 days*	Calculation derived from the normative panorama

Source: Authors' elaboration.

On the other hand, employees who want to drive electric or plug-in hybrid cars will be able to take advantage of lower taxes. Surprisingly, a specific misalignment of interests seems to be present, and the balance between cost and benefits, personal, organisational and environmental, seems to be strongly disproportionally operated. In this sense, in attributing the benefit, the market effect connected to the production of electric cars and their sale is not considered; it is currently still focused on an almost niche segment. Therefore, image and status repercussions would be a penalty for companies that cannot afford to change

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

their car fleet, which, as things stand, is almost entirely made up of small-displacement petrol engines and the city car segment. This would enhance an image return on the social status of some who can afford electric cars, currently mostly included in non-city car segments (Li et al., 2022; Heffner, Kurani & Turrentine, 2005; Bennett & Vijaygopal, 2018) and of value certainly above the perceived average expenditure (Bhalla, Ali & Nazneen, 2018; Ou, Zhang, Lin & Davis, 2023; Ghasri, Ardeshiri & Rashidi, 2019).

3. Functionalism: rewards and inequalities as a theoretical mirror system

Inequitably sharing resources and rights due to class, racial, and gender hierarchies is the root cause of social inequality. It is strongly related to social stratification and manifests itself in several ways, including uneven access to education, discriminatory treatment by the legal system and law enforcement, and wealth disparities. Social inequality can be characterised by persistent patterns of unequal distribution of rewards and penalties, as well as unequal opportunities and rewards within a community (Hurst, Gibbon & Nurse, 2016; Blackburn, 2008). Social disparity is the subject of two major theories. Functionalist philosophy views it as both essential and advantageous, arguing that significant positions should be compensated more because they need more training (Levin, 2004; Davis & Moore, 1945; Tumin, 1953). Conflict theory, on the other hand, holds that inequality results from strong groups controlling weaker ones, preventing social advancement, and being upheld by cultural beliefs and norms (Wells, 1979). Society is like a living system where different parts work together for its health. Some roles are more important for survival than others. To keep society healthy, the most crucial positions need to be filled by qualified people, but only a few have the necessary skills and training. People need to be encouraged to invest time and money in their training. Thus, society rewards important roles with greater benefits, leading to some unavoidable inequality, which helps society function better. As reported by Harris (2003), following Davis and Moore (1945) and Tumin (1953), as an organic system, society is made up of many parts that cooperate to maintain the system's health. However, for society to survive, certain roles inside the system are more crucial than others. In this sense, (i) the most competent individuals must occupy the most functionally significant roles for a society to continue to operate well. There are not many people with the skills and/or training to fill these positions, though; (ii) people need to be persuaded to invest the time, energy, and money necessary for training; (iii) as a result, society gives higher compensation to jobs that are more crucial and call for fewer skills; (iv) societies use inequality, an unconscious system, to assign the best qualified individuals to the most important roles; (v) due to its beneficial effects on how societies function, inequality will always exist to some extent. As depicted by Jacob (1981), the principal points of divergence between the structural-functional and conflict theories of social and educational inequality centre on the nature of society's objective opportunity structure and the varying subjective perceptions of this structure by those who attempt to use it to make a claim to scarce social rewards. The structural functionalists see the social opportunity structure as accommodating an essentially free flow of talent and the inequality thus generated as a "functional necessity" to encourage those who possess the ability to take the time and energy to train for important and demanding occupations. Even if the functionalist theory may seem outdated, compared to that of conflict (Collins, 1981) and interactionist (Blumer, 1986) it still takes on its own value within the prescribed logic that, on the one hand, constitutes strong points of the existence of benefits for a segment of the

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

population, on the other hand reinforces the idea that through public policies, taxation or market boosting for sustainability (e.g. the case of electric cars), they would favour the emergence of new and wider and more perceived social inequalities, constituting welfare paradoxes. The disproportionate bill would therefore find confirmation in a practical dimension of inequality, determining a re-emerging structural functionalism of society, understood both at a personal and organisational level.

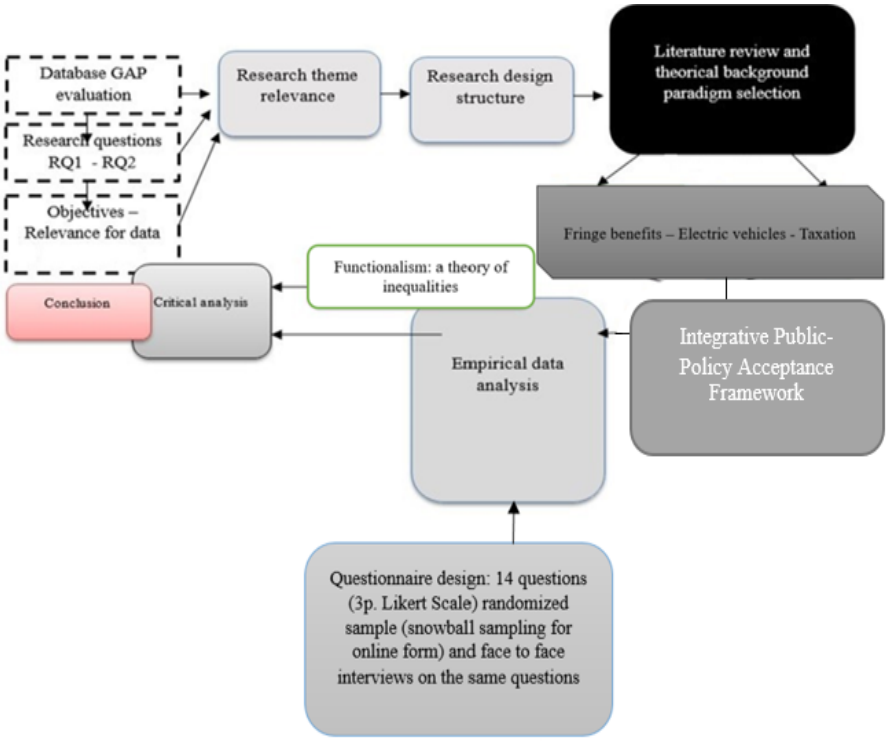
4. Methodology

At the methodological level, this research endeavour is fundamentally grounded upon a starting gap analysis, considering the multifaceted aspects of fringe benefits, taxation implications and the burgeoning relevance of electric vehicles in the contemporary discourse of smart mobility and smart living organisation. As regards the other component of the research, the active one within the relevant field, a meticulously crafted questionnaire (14 questions 1-3 points of agreement Likert scale) was administered to a predetermined number of participants thanks to both Google Forms (101 persons involved as respondents) (Roopa & Rani, 2012) and face-to-face interviews (80 persons involved as respondents) (Loosveldt, 2012). The data processed were collected considering the aspects of anonymity. The activity established, on one hand, a snowball sampling perspective (Goodman, 1961) (on the Google Form respondents) that allows for network-based recruitment of participants, while on the other hand, employing a completely randomised sample selection methodology to ensure a generalizable coverage of the resultant findings. The reason for this methodological choice was dictated by the multiplicity of objectives behind the investigation and to balance outcome optimisation to reach more respondents as well as ensure the best effects from the two approaches (web-mediated and face-to-face) (Zhang et al. 2017; Maqbool, Arul & Ashfaq, 2023). Therefore, on the one hand, the need to investigate an emerging policy, on the other, to balance the identification of the perception of potential users in terms of environmental, but also social, advantages. Therefore, within the acceptance framework, awareness of the problem, support-seeking characteristics, desire for governmental support and policy qualities represent valuable variables affecting policy acceptance and compliance (Grelle & Hofmann, 2024). Regarding the response to the RQs posed by the authors, this dynamic approach helps to respond to the need to establish who benefits from the policy and in what terms this regulation is qualitatively oriented towards holistic sustainability objectives (not limited to a single dimension of SDGs). In this sense, knowing the potential beneficiaries, the univocal segmentation of reference of the policy would decree the presumed risks of applicative interpretations, which in the quality dimension could, on the one hand, favour their acceptance in a discriminatory way. In addition, the perceptive analysis, both on the quantification of expenditure and on the sensitivity of attribution of value in reference to status symbols and image, provides useful indications for the purposes of the investigation to more easily determine the aspects of the welfare paradox. The questionnaire has been tested by the authors with cross-check criteria among the team, and the structure has been developed on perceptive dimensions justified by literary contributions in this direction. The questionnaire has been designed following the criteria of a hierarchy process, useful for perceptual discernment and decision making (Saaty, 1987), considering valuable variables in expressing preferences and perceptions (i.e. perception on luxury, importance, privilege, social status, spending possibility, prestige, value, image, fairness). In this way, the architectural structure of the questionnaire was built based on the main elements able to represent perceptions of driving a specific car type,

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

for expressing an expense range and sense of disparity, following the characteristics behind the logic of policy acceptance (Grelle & Hofman, 2024). The variables investigated by the questionnaire configure a literary anchorage in terms of considering people's ideas about luxury and necessity (Kemp, 1998) (Q1 Appendix1), perception of importance, privilege, social status, prestige and value by goods (Solomon, 2002; Han, Nunes & Drèze, 2010) (Q2- Q4 Appendix1) and occupation (Nilson & Edelman, 1979) (Q14 Appendix1), perceived image and self-image in sustainability pro-environmental friendly behaviours (Venhoeven, Bolderdijk, & Steg, 2016) (Q10 Appendix1), sense of equality and policy economic fairness and spending possibility (Alesina & Angeletos, 2005; Craig, Burchardt & Gordon, 2008; McKay, Murray & Macintyre, 2012; Chandrashekaran, 2020) (Q5-Q9 and Q11-Q13 Appendix1).

Figure 1. Research design and protocol



Source: Authors' elaboration

The research rigorously considers two overarching macro-categories of automobiles that are classified within segments A, B, E, and above. It specifically refers to pricing structures and additional pertinent information concerning vehicles as published in "Quattroruote" which is recognised as a leading magazine within the Italian automotive market. Building upon this foundational data set, it becomes feasible to estimate the requisite amount of taxation that would be owed if the car that has

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

been observed were to be allocated as a fringe benefit to an employee, thereby integrating economic considerations into the evaluation of managerial decisions regarding employee compensation. In addition to this primary investigation, the wider evidence highlights the critical dimension of the analysis toward a plausibly existing welfare paradox without determining the intangible, but perceivable, added benefit of driving an electric car today at both the individual, personal level and organisational level. The following figure (Fig.1) graphically represents the research design and the main steps of the protocol developed and conducted by the authors, specifically the gap evaluation, determining an area of investigation that is quite underestimated. The Italian context seems not deeply considered in terms of welfare paradox, taxation and mobility electrification.

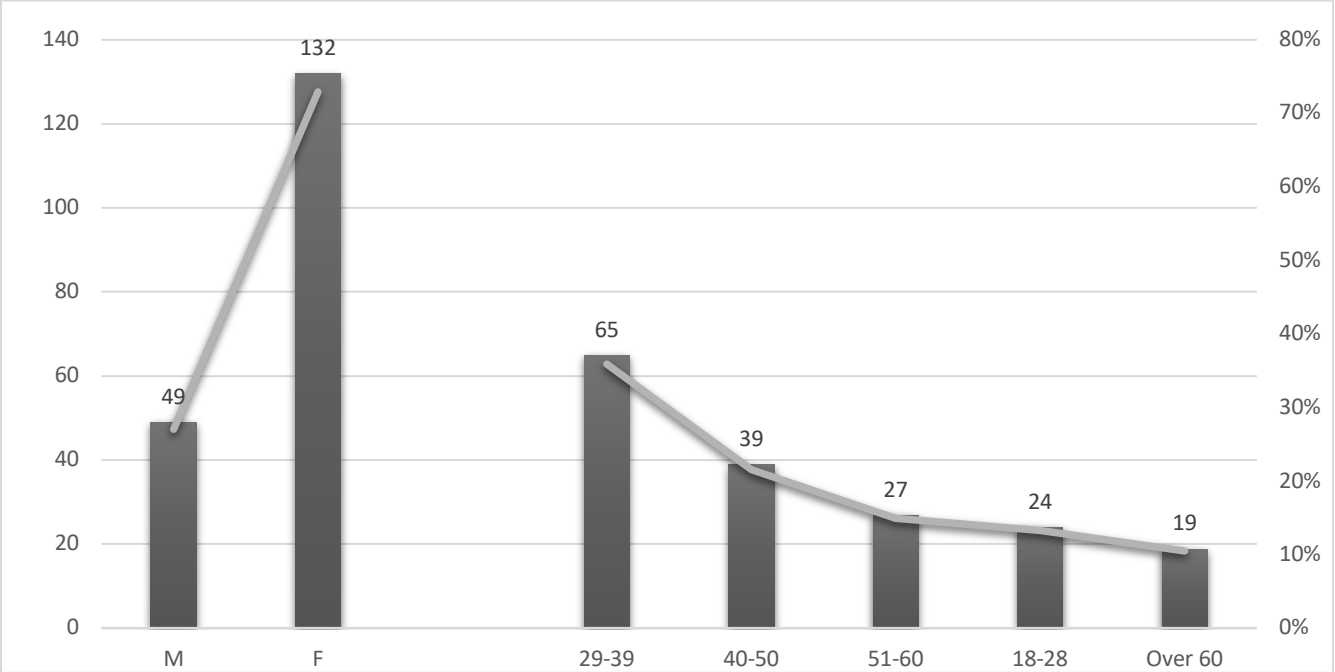
A kind of heterogenesis of purposes (Wundt, 1886) determines a clear political imbalance in the determination of strategies oriented to the promotion of zero-emission transport (Hart, Kyriakopoulou & Lu, 2024). To avoid opaque literary analysis or interpretations detached from factual reality, the authors have prepared an empirical analysis on a sample of 181 people, to whom a questionnaire of 14 questions was submitted. The sample was reached on a snowball sampling (Goodman, 1961) basis through an online format (101 respondents) and (80 face-to-face interviews) (Roopa & Rani, 2012; Loosveldt, 2012; Maqbool, Arul & Ashfaq, 2023). The 3-point Likert response scale was selected to ensure ease of response and avoid information dispersion in subsequent analyses compared to broader scales. This was done precisely due to the nature of the double sampling method, used in order to reach the greatest number of people with a plausible greater randomization The validation of the sample is dictated by a wide range of studies in perception analysis (Kaveh, Ostovarfar, Keshavarzi & Ghahremani, 2016; Fosu-Mensah, Vlek & MacCarthy, 2012; Qasim, Khan, Shrestha & Qasim, 2015; Gil, & Caspi, 2006; Almagro, Sáenz-López, Fierro-Suero & Conde, 2020; Adediwura, 2012) and the authors carried out a subsequent validation analysis with JAMOVI software, aimed at considering the reliability of the variables included in the survey items with respect to the sample subjected to the it using "α-Cronbach" result 0.858; thus defining one of the highest possible reliability results, which generally range between 0.6 and 0.8.

5. Results: The welfare paradox of fringe benefits in behavioural consuming propensity and image return perception

The first results that emerged concern the demographic perspective of the sample. In fact, the sampling territory reached various Italian areas, with reference to the automotive industrial hub (Piedmont-Lombardy, Italy). The size of the sample is represented in fig. 2 with 132 female respondents and 49 male respondents. 65 respondents between 29-39 years old, 39 between 40-50 years old, 27 between 51-60 years old, 24 between 18-28 years old and 19 over 60 years old. The average number of years of driving license possession for these subjects is equal to 19.63 years. Respondents were asked to rate their level of agreement with the question asked on a 3-point Likert scale (3 complete agreement, 2 medium agreement, 1 disagreement).

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Figure 2. Sample Consistency



Source: Authors' elaboration

In addition to the gap dimension, from which the authors started to shape the boundaries of their investigative approach, the empirical perspective of field analysis has brought out important findings in line with the RQs. In this sense, the taxation dynamics to favour the electric transition of mobility, starting from the company car fleet, could in some way impoverish the achievement of inclusion and equality objectives in favour of those inherent to the reduction of polluting agents. Therefore, within a dynamic of SDGs, the issue of consumption, even if by companies, with repercussions in the dimension of private promiscuous use, must find an organic determination of political action. Therefore, the lacking holistic vision highlighted in the analysis would take on the characteristics of a welfare paradox in terms of heterogenesis of ends. This, highlighting a rather warm reference panorama, in relation to the preference of receiving a benefit such as a mixed-use car, as well as the perspective on the image fallout that certain models would determine in the collective imagination as a status symbol, decrees the actual existence of a welfare paradox indisputably generated by the policies on fringe benefits and by the push for the electric transition of mobility. A double advantage, that of having a vehicle with potentially high-level performance and stylistic configuration, would ascribe a benefit in kind, in an increase in the standard of living not adequately assessed, indeed encouraged by the electrification policy. The negative factor of the case is that the ones to pay the price would be the smaller companies, or in any case, those that cannot upgrade their car fleet. More than a sustainability manoeuvre, this outlines the features of a functional market manoeuvre, which is well described by the dynamics of propensity and perception that can be derived from the data collected through questionnaires and field interviews. The questions in the questionnaire were limited to 14 with the specific

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

aim of delimiting the boundaries of a phenomenon that can currently only be observed through behavioural and propensity analysis. In this regard, Appendix 1 reports the structure of the questionnaire administered, to which reference is made. In detail, questions 1-4 relate to the dimension of perception of luxury and benefit both from a generic point of view in driving electric cars and in having a company car for mixed-use. Furthermore, the perception as a leader in the automotive sector in Germany is identified, in addition to the paradigm of social status relating to the electrified dimension of driving. Questions 5-7 relate to the investigation perspective inherent in the perception of price ranges of car purchases today and the dimension of the possibility of purchase. Questions 8-14 intersect the dynamics of perception of privilege and image feedback in reference to price, typology and zero-emission and combustion engines. In these terms, the policy condition constituted and considered as the main object of analysis, finds confirmation in data objectively evaluated with respect to preferences, perceptions and identifications with the actual benefit rather than that defined by the regulatory perspective. The data relating to the answers provided for questions 1-4 formally outline the existence in the collective imagination that the electric car is still a luxury good today (question 1; 75% - 3 Likert Scale positive agreement). In addition to this, the use of a car (not necessarily electric) is perceived as an important benefit (question 2; 91% - 3 Likert Scale positive agreement). The perception of the respondents is more than averagely positive in reference to the aspect of driving German-made cars (question 3; 58% - 3 Likert Scale positive agreement). Furthermore, the perception of a high social status for those who drive electric cars seems to be validated, confirming the hypothesis foreseen in question 1 on the identification of electric cars as luxury. Therefore, question 4 more than most of the sample considered responded positively (66% - 3 Likert Scale positive agreement). As regards the dimension relating to the justification of the price range to be considered as actually beyond the possibilities perceived by the sample analysed, in order to establish a valid indicator for the effective identification of the existence of double benefit in the specific case, in question 5 86% of respondents believe that the price range 13,000 – 16,000 euros for the purchase of a car is cheap (3 Likert Scale positive agreement). 75% of the sample believes that the price range between 16,000-25,000 euros for the purchase of a car today is within the spending possibilities of a good segment of the population, and therefore to be considered an average range (question 6; 3 Likert Scale positive agreement). As far as the price range of 25,000-40,000 euros is concerned, only 56% believe that this amount is within the means of a good portion of the population (question 7; 3 Likert Scale positive agreement), therefore it should be considered the threshold for which at least about 50% of the population could perceive a certain identification with a high threshold of value. In question 8, 81% of the sample analysed considers it a privilege to have a company car for mixed use (3 Likert Scale positive agreement). In question 9, more than half of the sample (57%) believes that driving a German-made car (most of the cars in the selected price range and production limit of electric vehicles, by the historical brand-recognized German VW group, against the emerging US Tesla and Chinese BYD)[3], would provide an advantage in terms of image and prestige, especially if it were provided for mixed use (3 Likert Scale positive agreement). The data is even more surprising if we add to the promiscuous use of a family car the fact that it is electrified. In fact, 71% of respondents to question 10 believe that under these conditions they would have an added value in terms of image impact in

[3] https://www.youpower.ch/il-mercato-delle-auto-elettriche-nel-mondo-nel-2023-24/#:~:text=I%20principali%20produttori%20di%20auto%20elettriche%2C%20come%20Tesla%2C%20Volkswagen%2C,e%20la%20diversit%C3%A0%20sul%20mercato

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

relation to the aspects of sustainability-friendly behaviours (3 Likert Scale positive agreement). The figure drops by about 10 percentage points if we refer to Italian brands. In fact, 62% of respondents to question 11 believe, despite the price range of 25,000-40,000 euros, that their image would gain value by driving a mixed-use car of Italian brands (question 11; 3 Likert Scale positive agreement). The emerging figure for the condition described above, but with mixed-use driving of electric cars of the same value (25,000-40,000 euros), rises to 70% (question 12; 3 Likert Scale positive agreement). The interesting data comes from question 13, which relates to the same price range limit (25,000-40,000 euros), the case of comparison with colleagues who can potentially drive cars in some way electrified for mixed-use, compared to those who are forced to drive combustion cars. In this sense, the feeling of backwardness is detected in 35% of the sample (3 Likert Scale positive agreement). Control question 14 confirms the same data previously detected by question 13, such that the feeling of backwardness in driving a combustion car compared to a mixed-use car in some way electrified stands at 33% (3 Likert Scale positive agreement). This symptomatic data refers with good approximation to the actual existence of a policy capable of leveraging the dynamics of the image as well as that of the mere objective of sustainability and incentives for electric mobility hinged on it. At this point, the welfare paradox would be verifiable to this extent, on the one hand, under the profile of potential double benefit favoured by the current policy that does not consider the opaque dynamics underlying the push for the electrification of company fleets as a primary boost for future mobility and urban organisation.

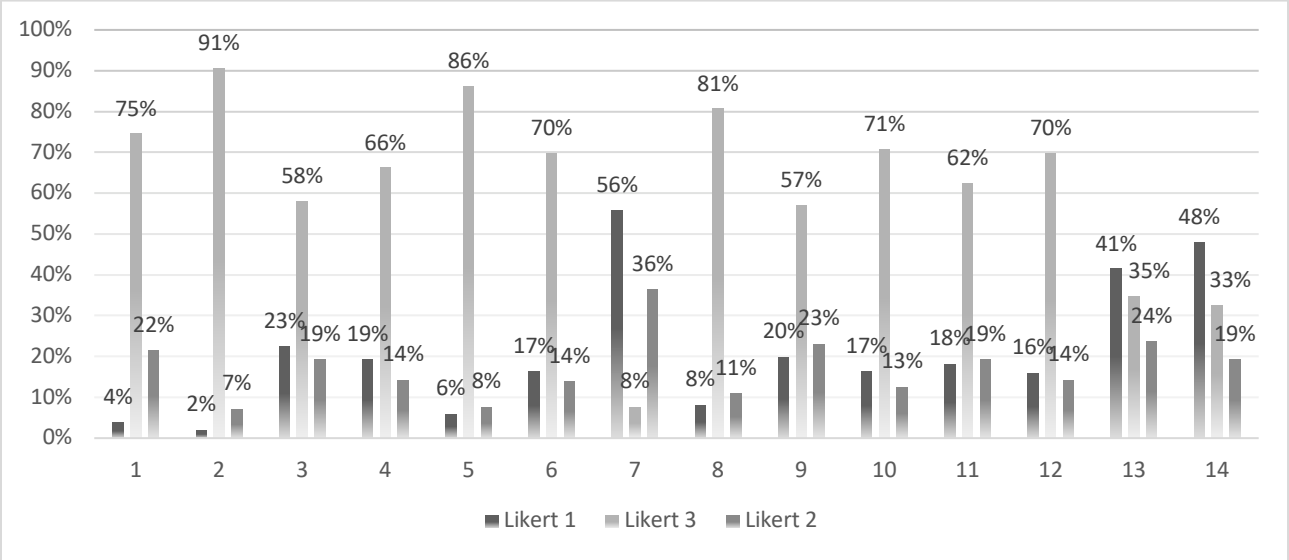
The results highlight how the electric car is perceived as a luxury good (75% agreement) and a symbol of high social status (66% agreement), with a general importance attributed to the use of the car (91% agreement).

Although most of the respondents consider prices up to €25,000 as “average” or “cheap” (75% agreement), the psychological price threshold for a large portion is set between €25,000 and €40,000 (56% agreement). Therefore, an electrified company car (in the €25,000-€40,000 range) confers a strong image value linked to sustainability (71% agreement), in addition to the fact that the use of the company car (mixed use) is already seen as a privilege (81% agreement). This has even more value considering the attribution of European PNRR funds to Italy, both for individuals and for companies, capable of reducing the price of the electric car by 50% and which, due to the nature of the approach, would constitute a social imbalance of access. This is even more indicative if read in parallel with the symptomatic data on the sense of backwardness felt by over a third of the sample (35% agreement) when driving a combustion car compared to an electrified vehicle for mixed use. This suggests that the policies that push the electrification of corporate fleets do not only act on sustainability, but effectively exploit the dynamics of image and status, verifying the existence of a potential double benefit in the push for electric mobility and configuring the actual hypothesis of a welfare paradox.

This research, through the data provided, aims to shed light in a systematic and detailed way on the actual existence of the perception of a double benefit not valorised to the detriment of the most polluting combustion vehicles. If, on the one hand, the behavioural dynamics have been outlined by the empirical evidence (fig. 3), the systematic factual dimension deriving from the evaluation formula of the fringe benefit for electric and combustion cars, provides the relevant and necessary details to elucidate readers in reference to a potentially unbalanced regulatory dynamic currently in place in the Italian context (tab. 2).

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Figure 3. Empirical survey data results



Source: Authors' elaboration

Table 2 provides the included vehicles, their price (and their segment) and the CO2 emissions. For a better comprehension, as anticipated in the introduction, the attribution to segments was made accordingly to the cars' market price. More precisely:

- Segment A: from € 12,500.00 to € 16,000.00.
- Segment B: from € 16,000.01 to € 25,000.00.
- Segment L: over € 60,000.00.

In terms of perceived average spending possibility and actual spending capacity for the Italian population, the segmentation was carried out on the basis of what is reported by a Forbes elaboration relating to average salaries, such that it is highlighted that in Italy (net), a head earns 4,473 euros, a manager 2,668 euros, an executive 1,818 euros and a workman 1,524 euros. Considering the size of the reference positions, 397,000 heads (public and private sector), 1,170,000 managers, 5,800,000 executives and 7,800,000 workmen would be respectively employed. In terms of the impact of the phenomenon, although detailed data on company fleets are not made public, it is possible to consider that at least 1 in 3 cars is rented. Therefore, it is presumable to deduce that company fleets are largely composed of cars acquired and given to employees as fringe benefits with this type of contract. Furthermore, deducting from the total number of cars in circulation (ACI data, 2023), approximately 41% are diesel-powered, and approximately 43% are petrol-powered. The remainder includes other alternative fuel engines, but less than 1% is fully electric and approximately 1% is represented by hybrid vehicles. At the moment, For methodological and rigor reasons, it is essential to specify that the certainty of the data is not clearly deducible, but considering that the first three categories (heads, managers and executives) would have access to the benefit based on reward criteria that could be established internally at each individual company, and although the case study makes a detailed analysis difficult, the authors, through this contextual framework, allow to glimpse the extent of the phenomenon on a rather large scale.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

European Journal of Social Impact and Circular Economy

UNIVERSITÀ DI TORINO

Table 2. Fringe benefit evaluation on selected car types in Italy

Constructor	Model	Engine	Segment	Market price (€)	Fringe benefit	Emissions (g/km)
Fiat	*600*	1.2 Petrol Mild Hybrid	B	25,200.00	2,249.55	109
	Tipo	1.6 Diesel	B	17,950.00	1,976.85	123
	Panda	1.0 Petrol Mild Hybrid	A	15,950.00	1,708.65	113
Citroën	*C3*	1.2 Petrol	A	15,240.00	1,890.00	123
	C3 Aircross	1.2 Petrol	B	19,090.00	2,042.55	139
Dacia	*Sandero*	1.0 Petrol	A	13,850.00	1,717.20	120
	Duster	1.2 Petrol Mild Hybrid	B	22,900.00	2,102.40	123
	Jogger	1.0 Petrol	B	18,750.00	2,042.55	127
Cirelli	*2*	1.5 Petrol/LPG	B	23,200.00	3,723.75	175
DR	*3.0*	1.5 Petrol	B	18,400.00	3,499.50	173
	5.0	1.5 Petrol	B	19,900.00	3,639.75	189
Evo	*3*	1.5 Petrol	B	16,400.00	2,011.05	152
	4	1.6 Petrol	B	17,900.00	3,763.50	172
	5	1.5 Petrol	B	17,900.00	3,709.50	168
Hyundai	*I10*	1.0 Petrol	B	18,100.00	1,892.70	114
	I20	1.2 Petrol	B	19,900.00	2,115.90	120
	Bayon	1.2 Petrol	B	21,350.00	2,102.40	120
Jeep	*Avenger*	1.2 Petrol	B	24,750.00	2,217.15	128
Kgm	*Tivoli*	1.5 Petrol	B	23,900.00	2,309.85	159
Kia	*Picanto*	1.0 Petrol	B	16,800.00	1,874.25	114
	Stonic	1.0 Petrol Mild Hybrid	B	24.200,00	1,978.20	119
	EV9	Electric	L	76,450.00	1,098.00	0
Lancia	*Ypsilon*	1.2 Petrol Mild Hybrid	B	24.900,00	2,172.15	101
Mazda	*2*	1.5 Petrol Mild Hybrid	B	20,300.00	1,990.35	107
	2 Hybrid	1.5 Petrol Full Hybrid	B	24,990.00	2,126.25	87
MG	*3*	1.5 Petrol Full Hybrid	B	19,990.00	2,397.15	100
	ZS	1.5 Petrol	B	17,990.00	2,016.45	156
Mitsubishi	*Spacestar*	1.2 Petrol	A	15,900.00	1,845.90	112
	Colt	1.0 Petrol	B	19,500.00	1,976.85	118

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/7691 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

	ASX	1.0 Petrol	B	24,900.00	2,174.40	134
Nissan	*Juke*	1.0 Petrol	B	25,000.00	2,094.30	133
Opel	*Corsa*	1.2 Petrol	B	19,900.00	1,978.20	116
	Frontera	1.2 Petrol Mild Hybrid	B	24,500.00	2,191.50	NA
Peugeot	*208*	1.2 Petrol	B	21,420.00	2,062.35	117
Renault	*Clio*	1.0 Petrol	B	19,000.00	1,842.75	118
	Captur	1.0 Petrol	B	23,850.00	2,080.35	131
Seat	*Ibiza*	1.0 Petrol	B	18,800.00	2,099.70	119
	Arona	1.0 Petrol	B	21,650.00	2,350.80	121
Skoda	*Fabia*	1.0 Petrol	B	20,700.00	1,981.80	117
	Kamiq	1.0 Petrol	B	25,500.00	2,103.30	123
Suzuki	*Swift*	1.2 Petrol Mild Hybrid	B	22,500.00	2,088.90	99
	Ignis	1.2 Petrol Mild Hybrid	B	21,400.00	1,895.40	112
	Vitara	1.4 Petrol Mild Hybrid	B	24,900.00	2,173.05	120
Toyota	*Aygo*	1.0 Petrol	B	18,950.00	1,883.25	108
	Yaris	1.5 Petrol Full Hybrid	B	24,550.00	2,355.75	87
Volkswagen	*Polo*	1.0 Petrol	B	23,500.00	2,167.20	123
Audi	*A6*	Electric	L	65,500.00	922.20	0
	e-Tron GT	Electric	L	128,400.00	1,611.15	0
	Q6 e-Tron	Electric	L	67,800.00	972.75	0
	Q8 e-Tron	Electric	L	82,100.00	1,143.30	0
BMW	*I5*	Electric	L	74,400.00	1,030.65	0
	IX3	Electric	L	74,700.00	1,048.95	0
	I7	Electric	L	126,500.00	1,586.85	0
Cupra	*Tavascan*	Electric	L	69,950.00	807	0
Ford	*Mustang Mach-E*	Electric	L	60,150.00	860.70	0
Jaguar	*I-Pace*	Electric	L	96,400.00	1,317.15	0
Lexus	*RZ Full Electric*	Electric	L	75,500.00	1,061.85	0
Lotus	*Emeya*	Electric	L	111,490.00	1,459.83	0
	Eletre	Electric	L	99,490.00	1,343.10	0
Maserati	*Granturismo*	Electric	L	202,000.00	2,447.70	0
	Grecale	Electric	L	110,000.00	1,651.65	0
Mercedes	*EQE*	Electric	L	77,352.00	1,083.75	0

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

	EQS	Electric	L	130,537.00	1,385.55	0
	EQS-SUV	Electric	L	135,448.00	1,739.25	0
	EQV	Electric	L	95,480.00	1,284.45	0
Polestar	*3*	Electric	L	85,900.00	1,313.40	0
	4	Electric	L	66,900.00	1,070.27	0
Porsche	*Taycan*	Electric	L	108,051.00	1,392.90	0
	Macan EV	Electric	L	87,147.00	1,264.65	0
Tesla	*Model S*	Electric	L	94,970.00	1,391.65	0
	Model X	Electric	L	101,970.00	1,456.95	0

Source: Authors' elaboration

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

6. Discussion

given the high percentage (75% agreement) on perceived electric car as luxury good and its perceived social status symbol (66% agreement), in addition to the psychological attribution on the importance to the use of car (91% agreement), in light of the data reported in Table 4 and in reference to those determined on the basis of the empirical analysis, the representation of a scenario of inequity in the treatment of corporate benefits relating to mixed-use cars consistently emerges. Based on the holistic reference of a qualitatively recognizable political action for the purpose of unconditional acceptance (Grelle & Hofman, 2024) and in light of organisational changes expressed towards sustainability (not mono-objective) (Müller & Siebenhüner, 2007; Young et al., 2015), to the question of whether sustainability policies can reduce welfare in a certain sense, the specific case represents an emblem of a configuration plausibly incongruous with respect to the formulation of an expressive advantage for some workers categories compared to others. In this sense, under the aegis of environmental sustainability and green mobility, it would promote a dissonance in the perception of equality, attributable to an exacerbated social functionalism (Hurst, Gibbon & Nurse, 2016; Blackburn, 2008; Levin, 2004; Davis & Moore, 1945). This disparity in treatment affects combustion vehicles in particular, favouring (with a potentially double advantage) electric vehicles, which in most cases are beyond the price range identified as a reasonable spending limit (16,000-25,000 euros) compared to that considered average for the population (25,000-40,000). The evident gap in the calculation of the benefit specifically takes on the appearance of a policy towards the electric transition, without this taking into account the actual benefit, immaterial and intangible, but still existing, with respect to the functional impact on the image, both individual and organisational, to which the fleet of vehicles should belong in terms of corporate social responsibility and sustainability action, accountable in the specific reports. In this direction, the question regarding the fact that sustainability policies can negatively impact welfare (Witt, 2021) would take on even more value, configuring a detrimental and distorting dynamic towards a heterogenesis of ends produced by the pursuit of a single objective (promoting the transition towards electric mobility), even to the detriment of sustainability inherent in inequalities. In reference to the dynamics of policy acceptance and the previously stated components determined by Grelle and Hofman (2024), in detail, the awareness of the problem is evidently expressed, as the need to reduce emissions from motorised mobility is relevant to the environmental issue. In reference to support-seeking, the latter is linked to the people's political sphere to act in a way that promotes their interests and values in the context of sustainable moving and living organisation. In reference to the desire for governmental support, the representation of motivated action in requesting political support for a relevant issue finds its verifiable expression in the preference for electric vehicles in terms of privilege (perceived need to be extended). The quality component of the policy, determinable in the ways in which people evaluate a specific policy, includes the effectiveness, transparency, intrusiveness, perceived fairness and related costs and potentials. In these terms, some of these evaluation variables are not addressed, decreeing a potential failure of the policy in the application, both in terms of acceptance and in terms of compliance. In fact, the highlighted (fringe benefit) policy fallout does not appear to be substantially valued in the determination of benefits, resulting in significantly lower benefits for exclusively electric cars, compared to combustion or

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/7691 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

hybrid cars, which are currently still most of the vehicles in use and supplied to companies[4]. This imbalance, dictated by the regulatory provision, would not only aggravate a situation already in crisis in the automotive market[5], but above all, it would have a negative impact on the requalification of company car fleets, which would sometimes prematurely fall into obsolescence, without adequate depreciation of use. In addition, as an incentive policy, if on the one hand, it is possible to push the habit of using electric vehicles towards a large target audience (Langbroek, Franklin, & Susilo, 2016), on the other it would provide, almost unduly, an image benefit that is not due, or in any case the result of a repay effect based on a psychological stimulus by a Pavlovian remembrance functional in obtaining a potential forced transition. From this drift, the main conclusion is the structural consideration of social functionalism (Hurst, Gibbon & Nurse, 2016; Blackburn, 2008; Levin, 2004; Davis & Moore, 1945), such that the inequality characterised by the persistence of paradigms of unfair distribution of rewards is legitimised, incentivising logics of position and social status.

This critical representation of the analysed normative phenomenon pertains to the substantial discrepancy that exists in the incongruous protection to favour an acceleration in the acceptance of the electric transition, without, however valorising the return quantum of the benefit under the welfare profile and the dynamics of positional status, which would only further stratify inequality redundancies

7. Conclusion

The research delves into the interplay between several conditions, such as climate change, urbanisation and mobility, with a specific focus on the implications related to the new regulations regarding fringe benefits for company cars in Italy, which started to take their effects at the beginning of 2025. The authors attest to the need for the establishment of urgency toward climate change and the critical role urban mobility demonstrates, particularly in relation to road transport, in contributing to CO2 emissions. The authors highlight the increasing interest in electric vehicles by global governments and markets. This interest is driven by both consumer awareness and policy interventions. In this way, notably, the EU's ambitious CO2 reduction targets mandate zero pollutant emissions in transportation and mobility by 2035 (Plötz et al., 2023). In this direction, the research document exposes the critical issues of building a taxation/tax exemption policy to divert human behaviour, more specifically that of consumer citizens, towards sustainable mobility. In fact, the legislator has thought of pushing the transition to the use of electric vehicles starting from company fleets and promoting, through fringe benefits for mixed-use cars, the use of these zero-emission means of transport, without, however considering some factors, which have been made explicit in the results of the study and which are reported here at the conclusion of the same. In fact, the authors focus attention specifically on a perceived paradox arising from the new Italian tax regulations on company cars used for mixed private and professional purposes concerning welfare conditions. These regulations significantly reduce the taxable benefit for fully electric vehicles (10%) compared to plug-in hybrids (20%) and petrol or diesel cars (50%). The authors argue that, while these policies aim to

[4] https://www.motus-e.org/wp-content/uploads/2023/05/Guida-Flotte-Def.pdf https://www.avrios.com/it/news/sostenibilita-flotta-aziendale-a-che-punto-siamo#:~:text=Le%20immatricolazioni%20di%20modelli%20a,'Olanda%2C%20la%20Francia).

[5] https://www.drcommodore.it/2025/02/14/crisi-settore-automotive-italia-2024/

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

promote sustainable mobility, by incentivising electric vehicle adoption, they inadvertently create welfare paradoxes and exacerbate social inequalities. According to the RQs, the analysis suggests that these (opaque) incentives disproportionately benefit potentially higher-income individuals and those in structured organisations who typically receive company cars as fringe benefits. Because electric cars, especially those in higher segments, remain more expensive than their fossil-fuelled counterparts and appear (paradoxically) more incentivised. In this sense, the substantial tax reduction on electric company cars primarily advantages those who might already be able to afford them. Conversely, lower-income individuals, for whom purchasing any environmentally sustainable car represents a significant financial burden, may not benefit as much from these policies and might still be pushed towards purchasing less expensive, higher-emission vehicles. The same discourse is valid for the organisational dimension in terms of ownership or leasing acquired vehicles. The benefits for both higher-income and functionally positioned employees and organisations would be doubled at the expense of the remaining segment of the population. These individuals and their organisations not only gain the benefit of an electric vehicle but also accrue an "image benefit" associated with sustainability and exclusivity, further enhancing their social status and corporate image, without intangible benefits being adequately considered in the welfare calculation. With regard to the academic configuration of regulatory interpretation of political economic-based action, aimed at the electric transition of mobility, lifestyle and sustainable organisational behaviour, the specific case object of the analysis, is prominently deficient at structural level, since, if on the one hand it recognizes the need and awareness towards an open global problem, on the other it would sharpen inequalities and perception of unfairness, decreeing its potential inapplicability and unacceptability by users and organisations. The study, at this stage, warns policy makers and potential users of a potential imbalance of intent with respect to the ideally pursued objectives.

The consideration that the research mainly aims to expose, is not so much that of providing a roadmap for application or a further evaluation system toward the fringe benefit for cars in promiscuous use, but rather to offer insights to policymakers. In this sense, it refers to the conditioning dynamics that would come to be implemented concerning the electric mobility transition, implemented through normative pushes and induced institutional pressures, which would do nothing but fuel social frictions and welfare paradoxes. Rethinking the field of action in the light of a more equitable and systematic distributive paradigm could guarantee, on the one hand, a more gradual transition, because sudden change tends to produce reticence and barriers (Hobson, 2001). In addition to this, rethinking the regulatory frame and the regulatory context of the case, considering a more equitable evaluation, would produce positive effects in terms of inequality perception, with improvements also in relation to productivity and performance aspects on the employees' side. Therefore, anchoring a reward system to this type of benefit, in relation to productivity parameters or specific behaviours, oriented towards social and sustainability, would mitigate the watershed effect between privileged and non-privileged groups. Redefining the benefits not only in terms of the role but of the actual personal contribution and the ones toward the society as a whole starting from the organisation in which one's individual action extends, would be a useful balance to develop good inclusive practices of personal valorisation. The reference to the redefinition of mobility and the organisation toward the urban future, put all the actors involved in front of arduous challenges. The increasing digitalisation and the impact that this has on individual lives, necessarily exposes the reconsideration of the

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

human role in the VUCA-D society (Modarelli, 2025), decreeing the management positioning in the next few years more in line with a humanistic view. “Humanise humanity” is the sentence used by Mounier (1989) to define community personalism (Gilmore, 2023; Maritain, 1939; Mounier, 1989). In this sense, it is possible to use the term “re-humanise humanity”, to avoid inequalities, and to prosper soon according to the SDGs in the governments’ Agendas.

From the point of view of the quality of politics, according to the criteria identified in the literature, the size of the results would determine a disproportionality in the attribution of benefits, both of an economic and intangible nature. From the point of view of paradox, that of welfare, deducible from an application of regulatory policy, would originate from an exacerbated functionalism, such that the inherent inequity would decree an effective inapplicability in terms of acceptance. While acceptance favours the positive implementation of policy, the dissonances revealed through regulatory analysis outline critical aspects that policymakers could recalibrate a posteriori, reconfiguring the quantitative dimension with respect to benefit, thus achieving an effective balance. For scholars and researchers, however, the literary void on the subject positions the study as a basis for investigation, opening up new lines of inquiry since the effects of this political prerogative could be visible in the coming years, and the authors, on the one hand to better map the trend, on the other the actual application and its explanatory methods within the individual companies, will prepare a research agenda properly oriented towards these objectives with a longitudinal vision, as well as direct questioning of the main users, beneficiaries, subjects on whom the political determination will fall. Limitations of the research are identified in the impossibility of accessing detailed data, which will certainly be referred to by interviewing companies and opting for ethnographic analyses operating as insiders. In this regard, the intrinsic limitation arising from the exploratory nature of the phenomenon’s emergence could be overcome through a posteriori and longitudinal analyses of the regulations’ implementation. A valuable avenue for future research would focus on the analysis of individual case studies directly with companies or groups of companies adopting the regulations. Further national and cross-national comparative analyses could be conducted for determining alignments or misalignments between practices. Experimental or quasi-experimental perspectives could be considered as specific methods for redefining the regulations’ contours, promoting recalibrations of benefits, including social variables.

Declaration

No research funding was received

No competing interest to declare

Referring regulatory notes

Fringe benefit legal notes 2025:

-TUIR (Consolidated Law on Income Taxes - Testo Unico delle Imposte sui Redditi), art. 51, c. 4, lett. a; Modified by L.207/2024 art.1 c.4

-Traffic Laws - Codice della Strada, art. 54, co. 1, lett. a, c e m;

-Revenue Agency Circulars - Circolari Agenzia delle Entrate No. 326/97 and 1/2007;

-Ministerial Circular - Circolare Ministeriale 11/E/2007;

-Budget Bill 2025 - Disegno di legge di Bilancio 2025.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

References

Alesina, A., & Angeletos, G. M. (2005). Fairness and redistribution. American economic review, 95(4), 960-980.

Banister, D. (2008). The sustainable mobility paradigm. Transport policy, 15(2), 73-80.

Bhalla, P., Ali, I. S., & Nazneen, A. (2018). A study of consumer perception and purchase intention of electric vehicles. European Journal of Scientific Research, 149(4), 362-368;

Bide, T., Novellino, A., Petavratzi, E., & Watson, C. S. (2023). A bottom-up building stock quantification methodology for construction minerals using Earth Observation. The case of Hanoi. Cleaner Environmental Systems, 8, 100109.

Blackburn, R. M. (2008). What is social inequality?. International Journal of Sociology and Social Policy, 28(7/8), 250-259.

Blumer, H. (1986). Symbolic interactionism: Perspective and method. Univ of California Press.

Bonomi, A., & Masiero, R. (2014). Dalla smart city alla smart land. Marsilio Editori spa.

Borruso, G., & Balletto, G. (2022). The image of the smart city: new challenges. Urban Science, 6(1), 5.

Brescia, V., Degregori, G., Maggi, D., & Hadro, D. (2023). An integrated vision of electric vehicles' consumer behaviour: Mapping the practitioners to consolidate the research agenda. Journal of Cleaner Production, 410, 137210.

Burrows, R., & Loader, B. (Eds.). (1994). Towards a post-Fordist welfare state? (p. 1). London: Routledge.;

Chandrashekaran, R. (2020). Spending propensity and price perceptions. The International Review of Retail, Distribution and Consumer Research, 30(2), 193-212.

Chmet, F., Brescia, V., Degregori, G., & Biancone, P. (2024). Supply Chain and Logistics in Smart Cities: A Systematic Literature Review. Journal of Infrastructure, Policy and Development, 8(8), 1-27.

Clemens, J., Kahn, L. B., & Meer, J. (2018). The minimum wage, fringe benefits, and worker welfare (No. w24635). National Bureau of Economic Research

Collins, R. (1971) Functional and conflict theories of educational stratification, American Company.

Craig, G., Burchardt, T., & Gordon, D. (Eds.). (2008). Social justice and public policy: Seeking fairness in diverse societies. Policy Press

Crowley, M., Tope, D., Chamberlain, L. J., & Hodson, R. (2010). Neo-Taylorism at work: Occupational change in the post-Fordist era. Social Problems, 57(3), 421-447.

Curtale, R., Liao, F., & van der Waerden, P. (2021). Understanding travel preferences for user-based relocation strategies of one-way electric car-sharing services. Transportation Research Part C: Emerging Technologies, 127, 103135.

Da Cruz, N. F., Rode, P., & McQuarrie, M. (2019). New urban governance: A review of current themes and future priorities. Journal of Urban Affairs, 41(1), 1-19.

Danielis, R., Rotaris, L., Giansoldati, M., & Scorrano, M. (2020). Drivers' preferences for electric cars in Italy. Evidence from a country with limited but growing electric car uptake. Transportation Research Part A: Policy and Practice, 137, 79-94.

Davis, K. and Moore W. (1945). "Some Principles of Stratification", American Sociological Review 10:242-249.

Docherty, I., Marsden, G., & Anable, J. (2018). The governance of smart mobility. Transportation Research Part A: Policy and Practice, 115, 114-125.

Ed-Dafali, S., Adardour, Z., Derj, A., Bami, A., & Hussainey, K. (2025). A PRISMA-Based Systematic Review on Economic,

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Social, and Governance Practices: Insights and Research Agenda. Business Strategy and the Environment, 34(2), 1896-1916.

Evans, L., Maio, G. R., Corner, A., Hodgetts, C. J., Ahmed, S., & Hahn, U. (2013). Self-interest and pro-environmental behaviour. Nature Climate Change, 3(2), 122-125

Faria, R., Brito, L., Baras, K., & Silva, J. (2017, July). Smart mobility: A survey. In 2017 International conference on internet of things for the global community (IoTGC) (pp. 1-8). IEEE.

Gallo, M., & Marinelli, M. (2020). Sustainable mobility: A review of possible actions and policies. Sustainability, 12(18), 7499.

Gazzola, P. (2018). Behind the sharing economy: innovation and dynamic capability. Knowledge management in the sharing economy: cross-sectoral insights into the future of competitive advantage, 75-94.

Ghasri, M., Ardeshiri, A., & Rashidi, T. (2019). Perception towards electric vehicles and the impact on consumers' preference. Transportation Research Part D: Transport and Environment, 77, 271-291)

Gilmore, L. J. G. M. (2023). Emmanuel Mounier's Singular and Relational Person: A Communitarian Personalist Understanding of Personhood (Doctoral dissertation, Université d'Ottawa/University of Ottawa)

Goodman, L. A. (1961). Snowball sampling. The annals of mathematical statistics, 148-170.

Graf, J. (2023). The relationship between electric-vehicle driving and environmental self-identity: analyzing electric-vehicle driving experience, pro-environmental and pro-technological attitudes and the influence of framing

Grelle, S., & Hofmann, W. (2024). When and why do people accept public-policy interventions? An integrative public-policy-acceptance framework. Perspectives on Psychological Science, 19(1), 258-279

Gutiérrez-i-Puigarnau, E., & Van Ommeren, J. N. (2011). Welfare Effects of Distortionary Fringe Benefits Taxation: The Case of Employer-Provided Cars. International Economic Review, 52(4), 1105-1122.

Hallegatte, S., Rogelj, J., Allen, M., Clarke, L., Edenhofer, O., Field, C. B., ... & Van Vuuren, D. P. (2016). Mapping the climate change challenge. Nature Climate Change, 6(7), 663-668.

Han, Y. J., Nunes, J. C., & Drèze, X. (2010). Signaling status with luxury goods: The role of brand prominence. Journal of marketing, 74(4), 15-30.

Hamari, J., Sjöklint, M., & Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. Journal of the association for information science and technology, 67(9), 2047-2059.

Hart, R., Kyriakopoulou, E., & Lu, T. (2024). Urban transport policies and net zero emissions in the European Union. Annual Review of Resource Economics, 16.

Harris, S. R. (2003). Critiquing and expanding the sociology of inequality: Comparing functionalist, conflict, and interactionist perspectives. Quarterly Journal of Ideology, 25, 1-21.

Heffner, R. R., Kurani, K. S., & Turrentine, T. (2005). Effects of vehicle image in gasoline-hybrid electric vehicles; Bennett, R., & Vijaygopal, R. (2018). Consumer attitudes towards electric vehicles: Effects of product user stereotypes and self-image congruence. European Journal of Marketing, 52(3/4), 499-527.)

Hertzke, P., Müller, N., & Schenk, S. (2017). Dynamics in the global electric-vehicle market. McKinsey Center for Future Mobility.

Hertzke, P., Müller, N., Schenk, S., & Wu, T. (2018). The global electric-vehicle market is amped up and on the rise. McKinsey

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Cent. Futur. Mobil, 1, 1-8.

Hobson, K. (2001). Sustainable lifestyles: rethinking barriers and behaviour change. In Exploring sustainable consumption (pp. 191-209). Pergamon.)

Hurst, C., Gibbon, H. F., & Nurse, A. (2016). Social inequality: Forms, causes, and consequences. Routledge.;

Kemp, S. (1998). Perceiving luxury and necessity. Journal of economic psychology, 19(5), 591-606

Kim, S. W., & Brown, R. D. (2023). Development of a micro-scale heat island (MHI) model to assess the thermal environment in urban street canyons. Renewable and Sustainable Energy Reviews, 184, 113598.

Kristal, T., Cohen, Y., & Mundlak, G. (2011). Fringe benefits and income inequality. Research in Social Stratification and Mobility, 29(4), 351-369.

Jacob, J. C. (1981). Theories of social and educational inequality: From dichotomy to typology. British Journal of Sociology of Education, 2(1), 71-89.

Langbroek, J. H., Franklin, J. P., & Susilo, Y. O. (2016). The effect of policy incentives on electric vehicle adoption. Energy Policy, 94, 94-103.

Levin, J. (2004). Functionalism. Stanford

Li, L., Wang, Z., Gong, Y., & Liu, S. (2022). Self-image motives for electric vehicle adoption: Evidence from China. Transportation Research Part D: Transport and Environment, 109, 103383

Lindbeck, A. (1995). Welfare state disincentives with endogenous habits and norms. The Scandinavian Journal of Economics, 477-494.

Long, Z., & Axsen, J. (2022). Who will use new mobility technologies? Exploring demand for shared, electric, and automated vehicles in three Canadian metropolitan regions. Energy Research & Social Science, 88, 102506.

Loosveldt, G. (2012). Face-to-face interviews. In International handbook of survey methodology (pp. 201-220). Routledge.

Maqbool, R., Arul, T., & Ashfaq, S. (2023). A mixed-methods study of sustainable construction practices in the

UK. Journal of Cleaner Production, 430, 139087.

Maritain, J. (1939). Integral humanism and the crisis of modern times. The review of politics, 1(1), 1–17.

McKay, S., Murray, M., & Macintyre, S. (2012). Justice as fairness in planning policy-making. International Planning Studies, 17(2), 147-162.

Modarelli, G. (2025). Corporate fallacy and potentials in the VUCA-D society: Re-identifying the self inside-out the organizations. Corporate And Business Strategy Review, 6(1), 228-229.

Modarelli, G., Sadraei, R., & Rainero, C. (2024). How to perceive sustainable moving and smart mobility today?: A cross-national comparative longitudinal perspective and the controversy of alternative transport systems. Journal of Cleaner Production, 468, 143121.

Modarelli, G., Sadraei, R., & Rainero, C. (2024). How to perceive sustainable moving and smart mobility today?: A cross-national comparative longitudinal perspective and the controversy of alternative transport systems. Journal of Cleaner Production, 468, 143121;

Mounier, E. (1989). Personalism. University of Notre Dame Press.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Müller, M., & Siebenhüner, B. (2007). Policy instruments for sustainability-oriented organizational learning. Business Strategy and the Environment, 16(3), 232-245.

Nigro, N., & Policy, A. P. (2024). Electrifying US Transportation

Nilson, L. B., & Edelman, M. (1979). The symbolic evocation of occupational prestige. Society, 16(3), 57-64.

Nisbett, R. E., & Wilson, T. D. (1977). The halo effect: Evidence for unconscious alteration of judgments. Journal of personality and social psychology, 35(4), 250.

Onat, N. C., & Kucukvar, M. (2022). A systematic review on sustainability assessment of electric vehicles: Knowledge gaps and future perspectives. Environmental Impact Assessment Review, 97, 106867

Ou, S., Zhang, S., Lin, Z., & Davis, S. (2023). A method for determining optimal electric range by considering electric vehicle lightweighting on perceived ownership cost. Journal of Cleaner Production, 385, 135606;

Pasternak, M., & Rico, C. (2008). Tax interpretation, planning, and avoidance: Some linguistic analysis. Akron Tax Journal, 23(1), 2;

Pedersen, J. S., & Wilkinson, A. (2018). The digital society and provision of welfare services. International Journal of Sociology and Social Policy, 38(3/4), 194-209.

Plötz, P., Wachsmuth, J., Sprei, F., Gnann, T., Speth, D., Neuner, F., & Link, S. (2023). Greenhouse gas emission budgets and policies for zero-Carbon road transport in Europe. Climate Policy, 23(3), 343-354

Porat, M. U. (2009). The information economy: definition and measurement. In Rise of the knowledge worker (pp. 101-131). Routledge.

Prakash, S., Apoorva, D. L., Omar, J. A., & Kumar, A. (2016). Strategy For The Development Of Smart Cities. International Journal of Advance Engineering and Research Development, 3(5).;

Rogers E.M. (1962) Diffusion of Innovations, New York, Free Press Macmillan

Roopa, S., & Rani, M. S. (2012). Questionnaire designing for a survey. Journal of Indian Orthodontic Society, 46(4_suppl1), 273-277.

Saaty, R. W. (1987). The analytic hierarchy process—what it is and how it is used. Mathematical modelling, 9(3-5), 161-176.

Solomon, M. R. (2002). The value of status and the status of value. In Consumer value (pp. 79-100). Routledge.

Sato, Y. (2009). How to measure human perception in survey questionnaires. International Journal of the Analytic Hierarchy Process, 1(2).

Secinaro, S., Brescia, V., Calandra, D., & Biancone, P. (2021). Towards a hybrid model for the management of smart city initiatives. Cities, 116, 103278.

Stephenson, D., & Vracheva, V. (2015). Corporate social responsibility and tax avoidance: A literature review and directions for future research. Available at SSRN 2756640

Stern, D. I., & Kaufmann, R. K. (2014). Anthropogenic and natural causes of climate change. Climatic change, 122, 257-269.

Swain, M., Nadimpalli, R., Das, A. K., Mohanty, U. C., & Niyogi, D. (2023). Urban modification of heavy rainfall: a model case study for Bhubaneswar urban region. Computational Urban Science, 3(1), 2.

Tumin, M. (1953). "Some Principles of Stratification: A Critical Analysis", American Sociological Review 18:387-394.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Turoń, K. (2023). Car-sharing systems in smart cities: a review of the most important issues related to the functioning of the systems in light of the scientific research. Smart Cities, 6(2), 796-808.

Vagnoni, E., & Moradi, A. (2018). Local government's contribution to low carbon mobility transitions. Journal of Cleaner Production, 176, 486-502.

Van Ommeren, J., Van Der Vlist, A., & Nijkamp, P. (2006). Transport-related fringe benefits: Implications for moving and the journey to work. Journal of Regional Science, 46(3), 493-506.

Vătămănescu, E. M., Nicolescu, L., Gazzola, P., & Amelio, S. (2023). Integrating smart mobility and electric car sharing adoption in a common framework: Antecedents and mediators. Journal of Cleaner Production, 418, 138254.

Venhoeven, L. A., Bolderdijk, J. W., & Steg, L. (2016). Why acting environmentally-friendly feels good: Exploring the role of self-image. Frontiers in Psychology, 7, 1846.

Venkatesh V., Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions, Decision Sciences, Vol.39, 273-315.

Venkatesh V., Davis F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, Vol.46, No.2, 186–204.

Venkatesh V., Davis, F.D. (1996). A Model of the Antecedents of Perceived Ease of Use: Development and Test, Decision Sciences, Vol.27, 451-481.

Venkatesh V., Morris M., Davis G. & Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View, MIS Quarterly, Vol.27, No.3, 425–478.

Wawer, M., Grzesiuk, K., & Jegorow, D. (2022). Smart mobility in a Smart City in the context of Generation Z sustainability, use of ICT, and participation. Ener.

Wells, A. (1979). Conflict theory and functionalism: Introductory sociology textbooks, 1928-1976. Teaching Sociology, 429-437.

Wibowo, A. S., & Septiari, D. (2023). How does the public react to the electric vehicle tax incentive policy? A sentiment analysis. Journal of Tax Reform, 9(3), 413-429.

Williams, F. (2003). Social relations, welfare and the post-Fordism debate. In Towards a post-fordist welfare state? (pp. 49-73). Routledge.;

Winkler, L., Pearce, D., Nelson, J., & Babacan, O. (2023). The effect of sustainable mobility transition policies on cumulative urban transport emissions and energy demand. Nature Communications, 14(1), 2357.

Witt, U. (2021). Does sustainability-promoting policy making reduce our welfare?. Ecological Economics, 188, 107130.

Wundt, W.M. (1886), Ethik: Eine Untersuchung der Thatsachen und Gesetze des Sittlichen Lebens, Enke, Stuttgart.

Young, W., Davis, M., McNeill, I. M., Malhotra, B., Russell, S., Unsworth, K., & Clegg, C. W. (2015). Changing behaviour: successful environmental programmes in the workplace. Business Strategy and the Environment, 24(8), 689-703.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12530 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

European Journal of Social Impact and Circular Economy

From Network Science to Social Impact: Rethinking Smart Cities and the Role of the Italian Third Sector

Daniel Iannaci[1*],

[1] Arcobaleno Cooperativa Sociale, Via Paolo Veronese, 202 - 10148, Turin (Italy)

d.iannaci@cooparcobaleno.net

*contact author

ORCID https://orcid.org/0000-0002-4890-5963

Received: 1/08/2025

Accepted for publication: 17/11/2025

Published: 29/12/2025

Abstract

This article explores the potential to adapt and reinterpret the model of the "eight urban networks" (CEEC), developed in China to promote intelligent and inclusive ecosystems, within the Italian context. Rooted in network science and aimed at fostering equity, efficiency, and social cohesion, the CEEC model is examined through a comparative lens in relation to practices within the Italian Third Sector, particularly the role of Type B social cooperatives and place-based impact platforms.

Through a literature review, an analysis of emerging urban policies, and a qualitative exploration of the Torino Social Impact case, the study highlights value-based and operational convergences, systemic differences, and enabling conditions for building impactful urban networks. A conceptual framework is proposed to integrate the contribution of social enterprises into urban governance processes, offering new perspectives for designing inclusive, sustainable, and civically engaged cities.

Keywords: Third sector, social cooperatives, smart cities, network science, urban ecosystems, social impact, accountability, Italy

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

European Journal of Social Impact and Circular Economy

UNIVERSITÀ DI TORINO

1. Introduction

In the evolving landscape of urban development, there is a growing need for frameworks that go beyond the traditional dichotomy between smart city technologies and social policy. While much of the existing literature focuses either on technological infrastructures or on participatory governance, limited attention has been given to models that integrate both dimensions through a network-based logic. This article addresses this gap by introducing a comparative reflection between the Chinese CEEC model (China Eight Ecosystem Cities) and the Italian experience of Type B social cooperatives and territorial impact platforms. The objective is twofold: to assess the relevance of the CEEC model for rethinking urban integration in European contexts, and to explore how hybrid organisations (specifically Type B cooperatives) can serve as infrastructural nodes within civic-driven urban ecosystems.

In recent years, growing interest in integrated urban models that combine social innovation, digital transition, and environmental sustainability has brought renewed attention to the role of the Third Sector in territorial systems. Type B social cooperatives – which combine work integration with the production of goods and services – have emerged as key actors within hybrid urban ecosystems where public institutions, private entities, and communities collaborate to generate social value.

In parallel, the evolution of social impact measurement standards and the spread of multidimensional assessment frameworks (BES, SDGs, ESG) have reinforced the relevance of organisational configurations capable of integrating economic outcomes with collective utility. Recent literature has highlighted how nonprofit organisations and social enterprises can serve as enabling "civic infrastructures" for territorial regeneration, collaborative economies, and urban resilience (Abanda & Tah, 2017; Albino et al., 2015; Allwinkle & Cruickshank, 2011; Secinaro et al., 2021).

Within this context, the Chinese experience of the "Eight Urban Networks" (China Eight Ecosystem Cities, CEEC) presents an emerging model based on distributed governance across eight functional infrastructures – health, education, safety, culture, sports, ecology, digital, and mobility – with the goal of ensuring equitable access, service efficiency, and social cohesion. This CEEC approach, to be showcased at Expo Osaka 2025 [1], implicitly reflects the logic of enabling urban platforms, in which diverse actors converge to co-produce relational goods, collaborative public services, and scalable social impacts (Agarwala & Chaudhary, 2019; Lan et al., 2019; X. Zhang, 2017; X. Q. Zhang, 2000). It represents a radical reinterpretation of urban integration, grounded in the framework of the so-called "eight networks": energy, transport, digital, water, ecology, industry, health, and culture.

This article explores the possibility of transferring, adapting, and reinterpreting the CEEC model within the Italian context, with reference to the role of type B social cooperatives and local impact-oriented networks. Drawing on a conceptual analysis and a qualitative mapping exercise, the study seeks to examine how the principles underlying the CEEC model resonate with practices already underway in Italian urban settings, and whether commonalities, structural differences, and potential convergences can be identified.

[1] https://sustainabilityaward.it/osaka-2025-la-formula-delle-8-reti-le-smart-city-del-futuro-esistono-gia-in-cina/; https://www.rinnovabili.it/green-building/smart-city/citta-del-futuro-cina-osaka-2025-proposta/; https://it.euronews.com/2025/03/05/expo-2025-di-osaka-kansai-la-tecnologia-del-futuro-che-trasforma-mare-cielo-e-terra

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

The guiding research question is as follows: How can type B social cooperatives and urban impact platforms contribute to building integrated urban ecosystems inspired by the CEEC model, and what enabling conditions are required to support their emergence?

The relevance of this investigation lies in the need to update interpretative frameworks concerning the role of the Third Sector in urban policy design, considering the challenges posed by ecological transition, digitalisation, and growing inequalities. Notably, the recent 2024 Istat update on nonprofit institutions reports that, as of 2022, Italy hosts over 360,000 active entities, with significant presence in the fields of social, cultural, environmental, and educational services. Among these, type B social cooperatives constitute a crucial infrastructure for work inclusion and social innovation, operating at the intersection of public welfare and market mechanisms (Istat, 2024a; Istat, 2023). Furthermore, there are urban platforms that can play a pivotal role in these developments, as exemplified by the case of Torino Social Impact in the Turin context.

The structure of the paper is as follows: Chapter 2 presents the theoretical framework and references to the CEEC model; Chapter 3 outlines the adopted methodological approach; Chapter 4 discusses the results of the conceptual analysis and mapping; Chapter 5 offers a comprehensive discussion of implications, limitations, and future directions for researchers, managers, policymakers, and scholars. Finally, the conclusion summarises the main findings and suggests avenues for further exploration.

2. Literature Review

2.1 Network Science and Urban Systems

Network science has emerged as a fundamental analytical framework for understanding complex and interdependent systems, especially in urban contexts where technological, social, economic, and environmental subsystems intersect (Green & Newman, 2017; Newman, 2018; Pósfai & Barabási, 2016). Urban systems can be conceptualised as multilayered networks composed of nodes (e.g., infrastructures, institutions, communities) and edges (e.g., information flows, resource exchanges, regulatory interactions), whose configuration determines the resilience or vulnerability of the entire system.

Recent developments in network theory have emphasised the importance of inter-network dependencies and multiplexity in analysing urban robustness and cascading failure phenomena (Alshekhly, 2012; Boccaletti et al., 2014; Pósfai & Barabási, 2016). These contributions highlight how a failure in one infrastructural layer—such as the energy grid—can trigger systemic dysfunctions across sectors like transportation, digital services, and public health. This perspective is closely aligned with the integrated vision proposed by CEEC at Expo Osaka 2025, where each urban network is considered interdependent and critical to the overall functioning of the city.

Empirical applications of network science in urban planning have multiplied. For example, Batty et al. (2013; 2012) demonstrated the potential of network analysis to model urban growth, mobility, and land use planning, while Vespignani (2010) explored contagion dynamics and resilience through interconnected networks in cities. Additionally, recent research on *networked urbanism* emphasises the need for participatory governance and social infrastructure to support smart city

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

ecosystems (Sassen, 2018; Townsend, 2013). Emerging works stress the relevance of hybrid governance frameworks and digital interoperability in the next generation of smart cities (Allam et al., 2022; Bibri, 2022; Connolly et al., 2021)

This theoretical foundation provides a robust lens through which to assess the feasibility of transposing the CEEC model to European cities. It underscores that the success of smart city initiatives is not determined solely by technological advancement, but by the relational structure that connects diverse urban actors and infrastructures.

2.2 Social Cooperatives and the Italian Third Sector

Italy has a longstanding tradition of cooperative enterprises integrated into its social and economic development strategies, particularly through the legal framework of Law 381/1991, which defines and supports "social cooperatives" as entities capable of combining entrepreneurial activity with explicit social aims (Borzaga et al., 2017). Among them, Type B social cooperatives are specifically dedicated to the work integration of disadvantaged individuals—operating in areas such as recycling, welfare services, and urban maintenance.

The Italian third sector represents a complex and dynamic ecosystem, as highlighted in the annual reports by ISTAT and the Ministry of Labour and Social Policies (MLPS, 2023). It includes over 360,000 organisations, such as associations, foundations, social enterprises, and cooperatives, often active at the intersection of public policy, social innovation, and community services (Campi, 2006; Pesenti & Lodigiani, 2015). These entities play a crucial role in delivering welfare, cultural, environmental, and local development services.

In recent years, tools for measuring and managing social impact have proliferated, including the Social Value Principles (Social Value International, 2021), the Global Impact Index developed in Italy (Iannaci et al., 2025), and indicators aligned with the SDGs and the BES framework (Enrico Giovannini et al., 2012). These instruments provide a robust foundation for assessing how cooperative action contributes to systemic goals, including social cohesion, labour inclusion, and sustainable development.

International literature increasingly positions social enterprises as civic infrastructures capable of reshaping urban welfare regimes through adaptive, mission-driven governance (Ben Chikha et al., 2025; Choi & Park, 2024; Roy et al., 2024)

Comparative studies underline the relevance of local embeddedness and stakeholder participation in enhancing social innovation performance across diverse national contexts (Osterczuk, 2025)

Torino Social Impact (TSI) stands out as a pioneering ecosystem where public institutions, private companies, universities, and third sector actors co-design solutions aimed at measurable impact. TSI is a living example of how multi-stakeholder collaboration, civic infrastructures, and data-driven evaluation can shape the social layer of urban networks (Ianuale et al., 2015; Liu et al., 2018). The initiative reflects a participatory, bottom-up approach to the smart city, complementing the top-down infrastructural logic proposed by CEEC.

Within this framework, social cooperatives can be understood not only as service providers but also as connective tissue of urban systems—strengthening cities' adaptive capacity, inclusion, and sustainability. Their rootedness in local communities, stakeholder-oriented governance, and mission-driven practices position them as potential catalysts in the transition towards integrated smart city models.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

3. Methodology

This study adopts a qualitative, theory-driven approach aimed at exploring the feasibility and implications of adapting integrated smart city models—such as the "eight networks" model developed by China Energy Engineering Corporation (CEEC)—to the Italian context, with particular emphasis on the role of the Third Sector and social cooperatives. The research design combines a critical literature review, document analysis, and the use of an illustrative case study to build a conceptual foundation and inform future empirical investigations.

First, the analysis is grounded in the theoretical framework of network science, which provides a conceptual lens for mapping urban interdependence and understanding the systemic role of social actors. This perspective enables a systemic interpretation of urban environments across infrastructural, digital, and social dimensions, facilitating the identification of patterns of interconnection, interdependence, and co-production of public value.

Second, a structured document analysis was conducted to examine the institutional, normative, and strategic landscape of the Italian Third Sector. Key documents include Law 381/1991 on social cooperatives, national strategies for social innovation (Presidency of the Council of Ministers, 2022), and guidelines for social impact measurement promoted by national and European institutions. These sources provide the regulatory and operational context within which social cooperatives operate and interact with public and private stakeholders.

Third, the case of Torino Social Impact (TSI) is used as an illustrative example of a functioning urban ecosystem oriented toward social innovation and measurable impact. TSI was selected based on several criteria:

- its multi-stakeholder governance structure involves public institutions, private companies, universities, foundations, and civil society organisations;
- its explicit mission is to enhance the impact economy through shared infrastructure, strategic partnerships, and capacity building;
- its alignment with urban innovation agendas, particularly in areas such as social entrepreneurship, digital transformation, and sustainability.

The selection was also motivated by the availability of publicly accessible documentation and the relevance of the TSI platform in the national and European debate on place-based impact ecosystems. However, the study acknowledges limitations due to the absence of primary data collection (e.g., interviews, surveys) and the exclusively document-based nature of the case analysis. These limitations restrict the scope of generalisation and call for cautious interpretation of the findings.

The methodological orientation is exploratory and interpretative, with the aim of generating hypotheses and conceptual insights rather than testing predefined variables. This approach supports the development of a transferable analytical framework, which can guide further empirical research involving:

- comparative analysis of impact-oriented urban platforms in different national contexts,
- triangulation of qualitative and quantitative data through stakeholder interviews and social network analysis,
- evaluation of social, economic, and environmental outcomes of cooperative-led initiatives in urban regeneration.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

By explicitly framing this study as a theory-building and hypothesis-generating exercise, it contributes to the foundation for future research pathways at the intersection of social innovation, urban studies, and network governance.

1. Results

The preliminary findings of this conceptual investigation highlight both points of convergence and structural divergences between the "eight networks" model developed by China Energy Engineering Corporation (CEEC) and the current configuration of Italian urban ecosystems, with reference to the role of the Third Sector and type B social cooperatives.

4.1 Mapping the Eight Networks in the Italian Context

The mapping analysis confirms that many of the eight networks identified by CEEC, especially those related to health, culture, ecology, and digital infrastructures, are already partially overseen by Italian nonprofit institutions. According to the most recent ISTAT data, in 2021, over 363,000 nonprofit institutions were active in Italy, including more than 28,000 in the health sector, approximately 47,000 in the fields of culture, sport and recreation, and over 25,000 in education and research activities, which also include initiatives in digital literacy and civic training (ISTAT, 2023, 2024).

Moreover, more than 19,000 organisations operate in the field of environmental protection and land stewardship, contributing to ecological transition and the promotion of local sustainability. It is worth noting that over 50% of nonprofit institutions with employees are engaged in multi-sectoral activities, indicating a growing trend towards integration across different fields and the construction of complex territorial networks.

4.2 The Role of Torino Social Impact

Second, the case study of Torino Social Impact (TSI) provides an advanced example of a multi-stakeholder configuration consistent with some of the systemic ambitions of the CEEC model. TSI has promoted social and urban innovation hubs, impact finance tools, and collaborative digital platforms, supporting a form of distributed urban intelligence based on civic participation, transparency, and an impact-oriented approach (Bäckstrand, 2006; Falomi & De Giorgio, 2019).

Key features of TSI include:

- Urban innovation hubs foster entrepreneurship and civic participation;
- Impact finance tools, such as social bonds and mission-oriented investment;
- Collaborative digital platforms promoting knowledge sharing, transparency, and interoperability;
- A commitment to data-driven evaluation and common standards for impact measurement (e.g., Global Impact Index, Social Value Principles).

TSI functions as a social-layer orchestrator, complementing traditional top-down infrastructure by embedding participatory logic and value co-creation into urban governance.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

4.3 Gaps and Limitations

However, significant structural limitations also emerge. The lack of an interoperable digital infrastructure between public entities and Third Sector organisations hampers the efficient coordination of networks. Information systems remain fragmented, as do funding mechanisms, which are often tied to temporary projects and incapable of supporting long-term systemic configurations (Campi, 2006; Pesenti & Lodigiani, 2015). A further critical issue concerns the absence of a unified framework for social impact assessment in urban contexts. Despite the growing use of tools such as Social Return on Investment (SROI) and the Global Impact Index (Iannaci et al., 2025), evaluation practices remain heterogeneous and poorly integrated into urban planning processes.

Despite these challenges, available data and observed experiences suggest that Italian social cooperatives, and the Third Sector as a whole, possess a latent potential to act as infrastructural nodes in intelligent, inclusive, and resilient urban systems. This potential can only be realised if supported by enabling public policies, investments in shared digital infrastructures, and participatory governance models consistent with the complexity of contemporary urban networks.

4.4 Emerging Potential

Nonetheless, the data suggest that the Italian Third Sector—and especially type B social cooperatives—possesses latent potential to act as infrastructural nodes in intelligent, inclusive, and resilient urban systems. Their embeddedness in local communities, capacity for employment inclusion, and multidimensional social missions position them as natural intermediaries within complex urban networks.

To unlock this potential, three enabling conditions are critical:

1. Public policy frameworks that recognise and support hybrid roles for social enterprises;
2. Investments in shared digital infrastructures enabling data interoperability and service integration;
3. Participatory governance models that reflect the multi-actor and systemic nature of contemporary urban challenges.

4.5 Conceptual Synthesis: Urban Networks + TSI Role

A final conceptual synthesis (Table 1) outlines how the eight CEEC networks could map onto Italian urban ecosystems and the connective role that Torino Social Impact might play in facilitating cross-sector collaboration.

In this perspective, TSI emerges as a transversal enabler, not focused on delivering services directly but rather on creating collaborative infrastructures that amplify the effectiveness of individual urban networks.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 1 - Italian urban ecosystems cross-sector collaboration.

CEEC Network	Italian Presence	Role of TSI
Health	Strong	Health innovation partnerships
Education	Strong	Digital literacy, impact education
Safety	Partial	Social innovation labs on urban safety
Culture	Strong	Cross-sector events and cultural hubs
Sports	Strong but fragmented	Platforming inclusive sport initiatives
Ecology	Strong	Green finance and circular economy pilots
Digital	Emerging	Digital platform for civic services
Mobility	Weak	Potential area for experimentation

Source: Author's elaboration

5. Discussion and conclusions

The proposed analysis suggests that the CEEC model of integrated urban networks, inspired by the experience of Osaka, provides a valuable interpretive framework for understanding the role of type B social cooperatives in Italy. These organisations, despite their specific legal and territorial characteristics, can be seen as enabling nodes within local civic infrastructures, capable of connecting needs, resources, and diverse stakeholders around objectives of inclusion and urban regeneration.

However, their potential is currently hindered by systemic constraints: the lack of interoperability between databases, insufficient public investment in social infrastructure, weak integration of impact evaluation into planning processes, and the fragmentation of policies across institutional levels. In response to these challenges, many social cooperatives are considering changing their legal form to access greater resources, simplify governance, or attract capital.

Yet this option deserves careful strategic reflection. It is not merely an organisational decision; it is an identity-driven and political choice, one that affects the normative and institutional heritage of the Italian Third Sector.

5.1 Implications for Researchers

For the academic community, type B social cooperatives represent an advanced model of organisational hybridity; merging market logics, social inclusion, and active citizenship. Examining them through the lens of urban networks enables researchers to move beyond sectoral approaches and explore how value is generated through hybrid configurations, producing redistributive, relational, and regenerative effects.

These insights open new frontiers for research: longitudinal impact evaluations, international comparisons, and analyses of the quality of interactions between public institutions and nonprofit actors. Moreover, linking this inquiry with the CEEC model allows for the integration of studies on welfare, smart cities, social capital, and ecological transition.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

5.2 Implications for Managers

For those leading type B social cooperatives, a crucial question arises today: should they retain the cooperative form or shift to a different legal structure? The pressure to adopt more streamlined or profit-oriented forms is understandable, yet it carries the risk of misalignment with the original mission.

The value of a social cooperative lies not only in its structure, but also in the trust it fosters within its territory, its capacity to attract and train disadvantaged individuals, and its civic embeddedness—features that distinguish it from other business models. Abandoning this identity, often to gain access to funding or incentives, may result in a loss of recognition and long-term impact.

What is needed, then, is a paradigm shift: not to change form to adapt to the system, but to strengthen the cooperative form to change the system by investing in organisational innovation, digitalisation, impact assessment, and new cross-sectoral alliances.

5.3 Implications for Policy Makers

For public institutions, the key question is not merely how to fund the third sector, but how to design enabling environments for social and territorial hybridity. Type B cooperatives, if adequately supported, can become permanent civic infrastructures, capable of generating positive externalities that reduce public expenditure and enhance social cohesion.

Policy frameworks should move beyond bureaucratic accreditation or one-size-fits-all grant schemes, and instead adopt more strategic models, such as:

- impact-oriented procurement (e.g., social clauses in public contracts),
- patient investments in social innovation,
- Incentivising tax regimes for organisations that reinvest in local communities,
- shared data infrastructures for impact measurement.

Above all, it is essential to safeguard the distinctiveness of social cooperatives within the European regulatory framework, which recognises them as "enterprises of general interest"—avoiding forced alignments with entities that are only formally nonprofit in nature.

5.4 The Role of Territorial Platforms: The Case of Torino Social Impact

In this context, intermediary platforms such as Torino Social Impact (TSI) can serve as decisive amplifiers. TSI exemplifies a collaborative, multi-stakeholder governance model capable of:

- aggregating supply and demand for social impact,
- facilitating cross-sectoral projects,
- disseminating shared standards and tools (e.g., impact assessment, ESG indicators),
- representing the ecosystem in institutional forums.

To effectively steer the ecosystem toward an Osaka-style model, such a platform must evolve from a networking space into a strategic design hub, equipped with:

- territorial co-investment instruments for cooperative and social enterprises,
- technical support for civic digitalisation and interoperability,

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

- permanent observatories for value creation (integrated evaluation and social reporting),
- continuous advocacy efforts toward local and national public administrations.

In this vision, TSI can become the local equivalent of a "ninth network": invisible yet connective, capable of ensuring systemic coherence among the eight physical and functional networks of the CEEC model. Its value does not lie in being an executive actor, but rather in orchestrating high-impact interactions with strategic intelligence.

5.5 Future Directions for Research and Policy

This article has laid the conceptual groundwork for interpreting Type B cooperatives as urban infrastructural actors, but further steps are needed:

- Empirical research should deepen the network analysis of urban ecosystems, mapping cooperative connections at the metropolitan scale.
- Impact evaluation studies should focus on long-term outcomes across dimensions such as labour inclusion, health equity, and environmental resilience.
- Policy analysis could explore comparative governance models across European cities, identifying what institutional configurations best support the role of social enterprises in smart cities.

Ultimately, the integration of social cooperatives into intelligent urban networks is not a given; it is a political project that requires intentional design, collective investment, and strategic alignment across sectors. Only by recognising and empowering their systemic function can we envision cities that are not only smart but also just, inclusive, and regenerative

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

References

Abanda, F. H., & Tah, J. H. M. (2017). *Internet of Things for urban sustainability*. https://doi.org/10.4324/9781315201863

Agarwala, N., & Chaudhary, R. D. (2019). China's Policy on Science and Technology: Implications for the Next Industrial Transition. *India Quarterly*, *75*(2), 206–227. https://doi.org/10.1177/0974928419841786

Albino, V., Berardi, U., & Dangelico, R. M. (2015). Smart cities: Definitions, dimensions, performance, and initiatives. *Journal of urban technology*, *22*(1), 3–21.

Allam, Z., Sharifi, A., Bibri, S. E., & Chabaud, D. (2022). Emerging trends and knowledge structures of smart urban governance. *Sustainability*, *14*(9), 5275.

Allwinkle, S., & Cruickshank, P. (2011). Creating smart-er cities: An overview. *Journal of urban technology*, *18*(2), 1–16.

Alshekhly, I. F. (2012). Smart Cities: Survey. *Journal of Advanced Computer Science and Technology Research Vol*, *2*(2), 79–90.

Bäckstrand, K. (2006). Multi-stakeholder partnerships for sustainable development: Rethinking legitimacy, accountability and effectiveness. *European Environment*, *16*(5), 290–306.

Batty, M. (2013). *The new science of cities*. MIT press. https://books.google.it/books?hl=it&lr=&id=yX-YAQAAQBAJ&oi=fnd&pg=PR7&dq=Batty,+M.+(2013).+The+New+Science+of+Cities.+MIT+Press.&ots=2mNj8YHdnC&sig=UDEELawwn0xc_CtS1gCAVWI1SMI

Batty, M., Axhausen, K. W., Giannotti, F., Pozdnoukhov, A., Bazzani, A., Wachowicz, M., Ouzounis, G., & Portugali, Y. (2012). Smart cities of the future. *The European Physical Journal Special Topics*, *214*(1), 481–518.

Ben Chikha, I., Salloum, C., El Hilali, N., & Jarboui, A. (2025). Fostering innovation through government initiatives for social entrepreneurship. *EuroMed Journal of Business*. https://www.emerald.com/insight/content/doi/10.1108/EMJB-10-2024-0253/full/html

Bibri, S. E. (2022). The social shaping of the metaverse as an alternative to the imaginaries of data-driven smart Cities: A study in science, technology, and society. *Smart Cities*, *5*(3), 832–874.

Boccaletti, S., Bianconi, G., Criado, R., Del Genio, C. I., Gómez-Gardenes, J., Romance, M., Sendina-Nadal, I., Wang, Z., & Zanin, M. (2014). The structure and dynamics of multilayer networks. *Physics reports*, *544*(1), 1–122.

Borzaga, C., Poledrini, S., & Galera, G. (2017). *Social Enterprise in Italy: Typology, Diffusion and Characteristics* (SSRN Scholarly Paper 3036384). https://doi.org/10.2139/ssrn.3036384

Campi, S. (2006). Sistemi di welfare mix e nuovi meccanismi di regolazione nel campo dei servizi sociali alla persona. Un confronto tra Italia e Belgio. *Impresa Progetto - Electronic Journal of Management*, *1*. https://www.impresaprogetto.it/essays/2006-1/campi

Choi, D., & Park, J. (2024). Local government as a catalyst for promoting social enterprise. In *The Third Sector, Social Enterprise and Public Service Delivery* (pp. 33–54). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781032616735-3/local-government-catalyst-promoting-social-enterprise-donwe-choi-jinsol-park

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Connolly, C., Keil, R., & Ali, S. H. (2021). Extended urbanisation and the spatialities of infectious disease: Demographic change, infrastructure and governance. *Urban Studies*, *58*(2), 245–263. https://doi.org/10.1177/0042098020910873

Enrico Giovannini, Adolfo Morrone, Tommaso Rondinella, & Linda Laura Sabbadini. (2012). L'iniziativa Cnel-Istat per la misurazione del Benessere equo e sostenibile in Italia. *Autonomie locali e servizi sociali*, *1*, 125–136. https://doi.org/10.1447/37771

Falomi, F. I., & De Giorgio, S. (2019). Managing ecosystems for social innovation: The case of Torino Social Impact. In *N/a* (pp. 1–25). https://re.public.polimi.it/handle/11311/1125658

Green, J., & Newman, P. (2017). Citizen utilities: The emerging power paradigm. *Energy Policy*, *105*, 283–293. https://doi.org/10.1016/j.enpol.2017.02.004

Iannaci, D., Gambassi, R., Iozzi, G., & Porquier, G. (2025). The Global Impact Index as a Tool for Assessing Inclusion and Social Effectiveness: Arcobaleno Social Cooperative's case. *European Journal of Social Impact and Circular Economy*, *6*(1), 14–31.

Ianuale, N., Schiavon, D., & Capobianco, E. (2015). Smart cities and urban networks: Are smart networks what we need? *Journal of Management Analytics*, *2*(4), 285–294. https://doi.org/10.1080/23270012.2015.1023856

ISTAT. (2023). *Risultati*. https://www.istat.it/statistiche-per-temi/censimenti/istituzioni-non-profit/risultati/

ISTAT. (2024). *Struttura e profili del settore non profit – Anno 2022*. https://www.istat.it/comunicato-stampa/struttura-e-profili-del-settore-non-profit-anno-2022/

Lan, H., Zhuang, T., Meng, Z., & Zu, X. (2019). Chinese regional economic cooperative development model based on network analysis and multimedia data visualization. *Multimedia Tools and Applications*, *78*(4), 4743–4765. https://doi.org/10.1007/s11042-018-6870-z

Liu, Y., Wang, M., Li, Q., Qin, Y., Li, J., Sun, F., & Zhan, M. (2018). Research on propagation of passenger flow in urban rail transit network for large-scale events. *2017 IEEE SmartWorld Ubiquitous Intelligence and Computing, Advanced and Trusted Computed, Scalable Computing and Communications, Cloud and Big Data Computing, Internet of People and Smart City Innovation, SmartWorld/SCALCOM/UIC/ATC/CBDCom/IOP/SCI 2017 - Conference Proceedings*, 1–6. https://doi.org/10.1109/UIC-ATC.2017.8397572

Newman, M. E. J. (2018). Estimating network structure from unreliable measurements. *Physical Review E*, *98*(6), 062321. https://doi.org/10.1103/PhysRevE.98.062321

Osterczuk, K. (2025). *Grassroots Social Innovation: The Role of Collaboration and Experiential Learning*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9781003545514/grassroots-social-innovation-karolina-osterczuk

Pesenti, L., & Lodigiani, R. (2015). *Oltre il welfare mix: Approcci al welfare plurale tra convergenza e differenziazione*. https://publicatt.unicatt.it/handle/10807/67820

Pósfai, M., & Barabási, A.-L. (2016). *Network science* (Vol. 3). Cambridge University Press Cambridge, UK: https://ucilnica2324.fri.uni-lj.si/pluginfile.php/1147/course/section/4652/book_chapter_4.pdf

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Roy, M. J., Rendall, J., Clewett, E., McMullan, J., Read, R., McLean, J., O'Hare, L., Bertotti, M., Kelly, M., & Baker, R. (2024). Is government policy a barrier or facilitator to the work of place-based community-led nonprofits? *Nonprofit Policy Forum*, *0*. https://www.degruyterbrill.com/document/doi/10.1515/npf-2024-0003/html

Sassen, S. (2018). *Cities in a world economy*. Sage Publications. https://books.google.it/books?hl=it&lr=&id=dhlcDwAAQBAJ&oi=fnd&pg=PP1&dq=Sassen,+S.+(2012).+Cities+in+a+World+Economy+(4th+ed.).+SAGE+Publications.&ots=NnP-E27tJw&sig=d1ii17rTEGCAXNYRFfd3Ger6ECA

Secinaro, S., Brescia, V., Iannaci, D., & Barreca, M. (2021). Performance Evaluation in the Inter-Institutional Collaboration Context of Hybrid Smart Cities. *Journal of Intercultural Management*, *13*(3), 20–46.

Townsend, A. M. (2013). *Smart cities: Big data, civic hackers, and the quest for a new utopia*. WW Norton & Company.

Vespignani, A. (2010). The fragility of interdependency. *Nature*, *464*(7291), 984–985.

Zhang, X. (2017). Overall planning and design of intelligent management system based on city level collaborative innovation technology resources. *Proceedings - 2016 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2016*, 448–454. https://doi.org/10.1109/ICITBS.2016.135

Zhang, X. Q. (2000). Housing reform and the new governance of housing in urban China. *International Journal of Public Sector Management*, *13*(6–7), 519–525. https://doi.org/10.1108/09513550010356575

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12412 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

European Journal of Social Impact and Circular Economy

UNIVERSITÀ DI TORINO

The Double Materiality for non-listed SMEs: Evidence from the EFRAG Public Consultation

Serena Santis*[1], Michela Bianchi[2], Alberto Incollingo[3]

[1]Affiliation Department of Political Science, University of Campania *Luigi Vanvitelli,* Italy

mail serena.santis@unicampania.it

*contact author

ORCID https://orcid.org/0000-0003-0919-2080

[2]Affiliation Department of Business and Management, LUISS University, Italy

mail mbianchi@luiss.it

*contact author

ORCID

[3]Affiliation Department of Political Science, University of Campania *Luigi Vanvitelli,* Italy

mail alberto.incollingo@unicampania.it

*contact author

ORCID

Received: 11/07/2025

Accepted for publication: 17/11/2025

Published: 29/12/2025

Abstract

This study aims to explore how respondents interpret and reply to the concept of double materiality as outlined in the Exposure Draft published by the European Financial Reporting Advisory Group (EFRAG) for the Voluntary Sustainability Reporting Standard for non-listed SMEs (VSME).

After a descriptive analysis categorising the respondents by affiliation, geographic origin, and sector, an inductive qualitative content analysis was conducted to examine the responses about the concept of materiality. This process included a thematic coding and the development of a taxonomy of arguments.

The findings reflect a generally positive perception of the inclusion of materiality within the VSME standard. Most of the respondents agreed with the language and approach to the principles of materiality, supported a materiality analysis, and approved the "if applicable" simplification mechanism. Nevertheless, both supportive and critical voices consistently raised concerns about the complexity of the language, lack of clarity, and limited operational guidance. Respondents emphasised the need for simplified terminology, practical tools, and concrete examples tailored to SMEs' capacities. Despite this general support, the final standard for non-listed SMEs, which was published in the meantime, omitted the materiality principle, citing implementation challenges, particularly for small entities with limited resources.

Keywords: Materiality; non-listed SMEs; sustainability reporting; VSME, Exposure Draft.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

1. Introduction

In an era where sustainability is increasingly central to business strategy, the concept of materiality plays a pivotal role in shaping the scope and relevance of corporate reporting (Baumüller & Sopp, 2021; Eccles et al., 2012; Raith, 2023), especially for small and medium-sized enterprises (SMEs), which constitute the vast majority of firms in the European economy.

Originally rooted in financial reporting, materiality refers to information that could significantly influence the decisions of a reasonable investor (U.S. Supreme Court, 1988). This traditional view, however, has progressively expanded beyond financial disclosure, as materiality has evolved to encompass environmental, social, and governance (ESG) concerns. In line with this development, a growing body of literature (Baumüller & Sopp, 2021; La Torre et al., 2020; Pizzi et al., 2023; Pozzoli et al., 2024; Raith, 2023; Setia et al., 2024) has highlighted materiality as a key issue in sustainability reporting, enhancing the relevance of disclosed information for decision-making.

Several conceptual approaches to materiality have emerged, including financial materiality, impact materiality, double materiality, and dynamic materiality, reflecting different reporting priorities and stakeholder needs (Giner & Luque-Vílchez, 2022; Oll et al., 2025).

The aim of this study is to analyse how the principle of materiality, as outlined in the European Financial Reporting Advisory Group (EFRAG)'s voluntary small and medium enterprises (VSME) Exposure Draft (ED), is interpreted and received by respondents. Specifically, it focuses on the responses to Questions 20, 21, and 22 of the public consultation, which respectively address: (1) the proportionality of the materiality principles' language and structure; (2) the obligation to perform a materiality analysis; and (3) the use of a simplified "if applicable" disclosure approach.

In line with Corporate Sustainability Reporting Directive (CSRD) 2022/2464, all large corporations, as well as listed SMEs, are required to provide comprehensive sustainability reporting, while for non-listed SMEs, adoption remains voluntary. However, it is important to note that the CSRD also has an indirect impact on non-listed SMEs, as they are often required to provide sustainability information due to their role within the supply chains of large companies and their significant dependence on bank credit (Allgeier & Feldmann, 2023). Therefore, the opportunity to follow standardised rules to meet the growing demand for sustainability data from business counterparties enables SMEs to more easily disclose their impact on the sustainable economy to produce higher-quality, more transparent reports (Steidle et al., 2025).

In this scenario, EFRAG was developing the European Sustainability Reporting Standards (ESRS) using the concept of double materiality that integrates both financial and impact materiality to assess not only how sustainability issues affect the company, but also how the company affects society and the environment. In particular, two projects have been launched regarding standards for SMEs. The first aims to develop a simplified standard for listed SMEs, small banks and captive insurers ("LSME"). In contrast, the second focuses on developing voluntary sustainability standards for non-listed SMEs (VSME), which fall outside the CSRD's mandatory scope but may choose to report voluntarily.

The decision to focus on non-listed SME stems from their substantial role in the economy (Ortiz-Martínez & Marín-Hernández, 2021) and their impact on the collective environmental and social footprint (Martins et al., 2022).

According to the European Union (EU) Annual Report, SMEs account for the vast majority of all enterprises, with non-listed SMEs comprising the largest share (EC, 2024). Therefore, integrating sustainability considerations into these firms may be seen as a strategic asset (Oduro & Haylemariam, 2025). However, most studies have focused primarily on large firms, leaving a critical gap in the literature regarding SMEs (Dinh et al., 2023; O'Reilly et al., 2025; Ortiz-Martínez & Marín-Hernández, 2024), thereby calling for further investigation.

From a methodological perspective, the study follows a two-phase approach. After downloading the responses to Questions 21–23 from the ED public consultation, in the first phase, we involve a descriptive analysis to categorise respondents by affiliation, geographical origin, and sector of activity. The second phase employs an inductive, qualitative content analysis to examine the open-ended comments submitted in response to the three selected questions. Thematic coding and cross-validation of arguments enabled the development of a robust taxonomy of respondents' perspectives. In particular, analysing the comments on questions allows for an understanding of stakeholder preferences regarding these critical topics.

The main findings reveal a consensus on the importance and relevance of the materiality concept within the VSME ED. Most respondents agreed that the language and structure were proportionate, recognised the requirement for a materiality analysis, and supported the simplified "if applicable" approach. However, a recurring theme, shared even among those in agreement, was the call for greater clarity, simplified language, and practical guidance. Respondents noted that complex terminology, insufficient examples, and limited resources could hinder SMEs' ability to effectively implement the proposed framework.

Unlike large and listed companies, non-listed SMEs are generally not subject to mandatory sustainability reporting, as defined by the CSRD, due to their limited resources, technical capacity, and stakeholder engagement mechanisms. This makes it critical to develop tailored guidance and simplified frameworks. However, EFRAG developing a voluntary sustainability reporting standard for non-listed SMEs represents a significant step forward towards accountability and harmonisation. Accordingly, the VSME standard is intended to harmonise the currently fragmented ESG data request landscape, which poses a considerable reporting burden for non-listed SMEs. By reducing the volume of uncoordinated information requests, the framework is expected to enhance these enterprises' ability to access financing, attract investors, and strengthen client relationships.

In conclusion, this study provides timely insights into stakeholder perceptions of materiality in the context of voluntary SME sustainability reporting.

It is worth noting that, despite respondents' feedback largely supporting the conceptual foundation of EFRAG's approach, the final version of the standard, released during the development of this study (at the end of 2024), ultimately omits the materiality principle also in light of the simplification programme introduced with the subsequent publication of the Omnibus Package by European Commission. In the authors' view, this decision reveals a partial coherence in the standard-setting process and suggests a misalignment with respondents' input that warrants further investigation in future research.

2. Background

2.1 Sustainability reporting for non-listed SMEs

Over the past decades, there has been a growing call for businesses to adopt sustainability practices (Erin et al., 2022). Many businesses are aware that investors, customers, and regulators are paying increasing attention to sustainability and other non-financial data (Deloitte, 2021).

Although individually small, SMEs have a significant impact on sustainability, for example, through their collective environmental and social footprint (Corazza, 2018; Jenkins, 2006), highlighting the importance of their involvement in sustainability reporting (Galli et al., 2024).

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

The literature (Appiah-Kubi, 2024; Lima et al., 2023; O'Reilly et al., 2025; Oduro & Haylemariam, 2025; Williamson et al., 2006) has highlighted several advantages of integrating sustainability into SME operations, including enhanced accountability, improved risk management, greater access to financing opportunities, and a strengthened corporate image. Additionally, sustainability-oriented SMEs may be more appealing to ESG-conscious investors, particularly in developed markets (Beck et al., 2018).

From an external perspective, sustainability disclosures can help SMEs increase trust with stakeholders, enhance their reputation, and foster stronger relationships with customers and suppliers (Williams & Schaefer, 2013). Furthermore, at the macro level, promoting the enduring sustainability and growth of SMEs is essential, as they serve as key drivers of national economic stability and play a pivotal role in advancing national sustainable development goals (Das et al., 2020).

Considering all these positive aspects, it is important to note that SMEs differ significantly from large enterprises in several ways, including personalised management, limited financial resources, constrained capacities, greater flexibility, a smaller and more concentrated customer base, narrower markets, and, at times, a lack of expertise (Alshawi et al., 2011; Ciliberti et al., 2011). A recent study by Setyaningsih et al. (2024) identified six types of barriers that SMEs face in preparing sustainable reports: financial, general attitude, knowledge and technology, organisational, policies and regulations, as well as socio-environmental barriers. Given these challenges, SMES must adopt tailored strategies, build internal knowledge, and establish appropriate management tools for sustainability practices (Burke & Gaughran, 2007; Ortiz et al., 2024).

Unlike financial reporting, the content of sustainability reports does not follow a comparable structure, and this may hinder their adoption, particularly for SMEs that often struggle to allocate the necessary technical, financial, and human resources for such activities (Baumann-Pauly et al., 2013; Jenkins, 2004; McWilliams & Siegel, 2000; Pizzi & Coronella, 2024).

In response to this gap, several international standards have emerged in recent years to promote consistency and comparability in sustainability disclosures. Among them, the Global Reporting Initiative (GRI) Standards have become the most widely adopted framework (KPMG, 2024). These standards are applicable to organisations of all sizes, both private and public, and aim to support the identification and transparent communication of their impacts on the economy, the environment, and society. Other international standards have been issued by the International Sustainability Standards Board (ISSB) under the auspices of the International Financial Reporting Standards (IFRS) Foundation.

In the European context, the EU has tasked the EFRAG with developing the European Sustainability Reporting Standards (ESRS). For SMEs, EFRAG is developing simplified sustainability reporting to help them provide information that can satisfy data requests from large companies, banks, and investors. To support and promote a harmonised European approach, the EFRAG has published the ED for VSME applying the concept of double materiality.

2.2 The concept of materiality in sustainability reporting

Materiality is a central concept in sustainability reporting. Literature highlights the complexity of identifying material sustainability issues due to the dynamic nature of materiality and the difficulty of defining relevant stakeholder groups (Raith,

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

2023). Issues such as climate-related risks and greenhouse gas emissions have gained prominence, emphasising the need to assess not only the financial impact but also the broader societal consequences (Khan et al., 2016).

As highlighted by Oll et al. (2025), another key point is the materiality assessment processes. In particular, the link with relevant stakeholder groups plays a crucial role in individuating the materiality concept. Multiple stakeholders can be interested in sustainability information with different preferences and diverse interests. For instance, employees may be more focused on social aspects, such as fair play, workplace safety, and diversity, prioritising the importance of these aspects. In contrast, environmental groups are likely to prioritise ecological impacts. Thus, there can be many points of observation. Precisely to corroborate the importance of different points of view, current materiality conceptions are rather various as proposed by different standards.

Over the past years, various standards have introduced distinct conceptualisations of materiality within the context of sustainability disclosure.

The International Sustainability Standards Board (ISSB), along with the Sustainability Accounting Standards Board (SASB), Securities and Exchange Commission (SEC), and the Taskforce on Climate-related Financial Disclosures (TCFD), adopts a financial materiality (outside-in) perspective, focusing on how environmental or social factors affect a firm's financial value (Carvajal & Nadeem, 2022; De Villiers & Dimes, 2023; Pigatto et al., 2023). These standards are designed primarily for investors and capital market participants (De Villiers & Dimes, 2023; Jørgensen et al., 2022).

In contrast, the Global Reporting Initiative (GRI) promotes an impact materiality (inside-out) view, where material issues concern the company's effects on people and the environment (Adams et al., 2021; De Villiers & Dimes, 2023). The primary users of such disclosures are stakeholders affected by the company's activities.

Building upon both these views, the EFRAG introduced the concept of the double materiality (DM) approach within the ESRS, combining impact and financial materiality.

From a single point of view, under the impact materiality perspective, a sustainability matter is considered material if it results in, or has the potential to result in, significant positive or negative impacts on people or the environment over short-, medium-, or long-term time horizons. This includes impacts directly linked to business operations (EFRAG, 2024).

From a financial materiality perspective, a sustainability matter is considered material if "it pertains to financial risks that could be reasonably expected to have material financial effects materially influencing the undertaking's financial position, financial performance, cash flows, access to finance or cost of capital over short-, medium- or long-term time horizons" (EFRAG, 2024). Information is considered material when its omission, misstatement, or obscuration could influence the decisions of users. Overall, materiality assessments are based on the relevance and decision-usefulness of the information disclosed (EFRAG, 2024).

To evaluate financial and impact materiality, organisations must identify their external impacts and the stakeholders affected. The DM approach increases the primary audience beyond investors and capital market participants to include stakeholders such as citizens, consumers, employees, business partners, communities, civil society organisations, and future generations (Oll et

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

al., 2025). Within this dual perspective, financial material information is primarily relevant to investors, while social and environmental material information serves the broader stakeholder community (Abhayawansa, 2022).

In addition to the approaches described so far, there is a further concept to examine. The World Economic Forum has introduced the concept of dynamic materiality. This perspective recognises that information deemed immaterial today may become financially material in the near future. Like double materiality, this approach also integrates both "outside-in and inside-out" perspectives, with an aligned focus on a wide range of stakeholders.

2.3 The VSME Exposure Draft and its Materiality Framework

At the beginning of 2024, EFRAG launched the public consultation on its two ED of ESRS for listed (LSME) and non-listed SMEs (VSME). The aim of publishing the ED is to obtain feedback from stakeholders on key aspects, including the proposed architecture, the relevance of the proposed disclosures, the simplifications achieved, and overall market acceptance.

In particular, the VSME ED consists of three modules:

- The Basic Module is the entry level for non-listed SMEs and has a highly simplified language. Here, a materiality assessment is not required. Instead, the notion of "applicability" under defined conditions is introduced as a filter to guide the relevance of the reporting. This module is the target approach for micro-SMEs.
- The Narrative-Policies, Actions, and Targets (PAT) Module, which requires disclosures on strategy, material topics, stakeholder engagement, and governance, and mandates a materiality analysis. In particular, it includes the definition of financial and impact materiality and requires performing a materiality assessment. This module builds on the definitions established in Set 1 of the ESRS (applicable to all large companies), providing a balanced and reliable representation of how the company addresses sustainability matters, while also helping to prevent greenwashing. This module is designed for companies that have already begun the process of integrating sustainability into their operations.
- The Business Partners (BP) Module, which includes additional disclosures often requested by lenders, investors, and corporate clients, also requires a materiality assessment. SMEs use this module only when they receive ESG requests from business partners. It includes the metrics required by financial market participants, as well as other metrics relevant to business counterparts.

In summary, the structure of the Basic Module represents the foundation of the framework and focuses on essential sustainability topics. It requires SMEs to report on key environmental issues (such as energy consumption, greenhouse gas emissions, pollution, biodiversity, water use, etc.) as well as workforce-related aspects. The Narrative-PAT Module provides a more strategic and managerial perspective, for instance, on the management of material sustainability matters. It highlights the actions or policies companies have implemented to improve performance, particularly regarding energy efficiency and greenhouse gas reduction. This module also covers social and governance aspects. The BP Module is primarily designed to respond to information requests from external counterparties such as large companies, banks, and investors. It requires disclosures on revenues from specific sectors, climate-related targets and transition plans, exposure to physical climate risks,

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

and management of hazardous or radioactive waste. From a social perspective, indicators such as work–life balance policies and the number of apprentices employed are evaluated.

Therefore, the structure of the VSME standard is progressive.

Regarding the concept of materiality, as mentioned earlier, the Narrative PAT Module and BP module require the recognition and disclosure of matters that are material, based on the relevance of this information to users. EFRAG emphasises that the materiality section is highly simplified using clearer language and ensuring consistency of terminology with Set 1 ESRS (the same standards applied to large companies). Moreover, a list of sustainability topics is provided to facilitate the identification of material matters.

EFRAG bases the materiality concept on: impact materiality, financial materiality and stakeholders and their relevance to the materiality analysis process.

In particular, in ED, the approach to materiality of matters and the principles for preparation (common to Narrative-PAT and BP Modules) are addressed in questions 20, 21, and 22.

In particular, question 20 (Q20) requests feedback on "impact materiality", "financial materiality" and about "Stakeholders and their relevance to the materiality analysis process".

According to ED, "*From the impact perspective, a sustainability matter is to be reported on when it gives rise to material impacts. This includes:*

- *actual or potential impacts on people or on the environment over the short, medium, and long-term time horizons. An impact is actual when it is already happening, whereas an impact is potential when it is likely to happen; and*
- *impacts connected to the undertaking's own business operations, products and services as well as through its business relationships, such as those that arise from the operations of suppliers."*

Furthermore, to determine if an actual negative impact is material, three characteristics are considered: scale (the severity of the harm caused to people or the environment), scope (the extent of the harm caused to people or the environment), and the irremediable character of the impact.

Looking at the financial perspective, as said above, a sustainability matter is material *if it pertains to financial risks that could be reasonably expected to have material financial effects materially influencing the undertaking's financial position, financial performance, cash flows, access to finance or cost of capital over short-, medium- or long-term time horizons (VSME ED).*

Furthermore, the ED specifies that to determine whether a financial risk is material, the organisation shall assess the probability, nature, and potential magnitude of the financial effects.

About the section "Stakeholders and their relevance to the materiality analysis process", the stakeholders are those individuals or groups of people who can exercise influence and/or be affected by the activities of the organisations. Two main groups of stakeholders are identified:

- *affected stakeholders, i.e., individuals or groups of people whose interests are or could be – positively or negatively – affected by the undertaking's activities and its business relationships; and*

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

- *users of the sustainability report, including investors, lenders, business partners, social partners and civil society organisations*

The ED specifies that some stakeholders may belong to both groups as above defined.

In this context, the process of materiality assessment is closely linked to stakeholder engagement, as organisations are expected to involve their stakeholders in identifying which sustainability matters are most relevant. For SMEs, this may mean focusing only on a limited number of key stakeholders.

For the Q20, agreement or disagreement is requested, along with a space for comments regarding the language and approach to the Principles of Materiality.

About the question number 21 (Q21). The VSME ED requires performing a materiality analysis to disclose which sustainability matters are according to a proposed list.

The list of the sustainability matters (with a specification of topic, sub-topic, and sub-sub-topic) identifies the sustainability matters to report on the relevant topic and are the same as those contained in ESRS 1 "General Requirement" (para AR16). The topic is on climate change, pollution, water and marine resources, biodiversity and ecosystems, circular economy, own workforce, workers in the value chain, affected communities, consumers and end-users, and business conduct. This alignment with ESRS promotes consistency across the entire ESRS system and with CSRD provisions.

Furthermore, like ESRS 1, this approach aims to provide a credible and accurate representation of how the organisation addresses sustainability matters, thereby mitigating the risk of greenwashing. At the same time, ED requires the disclosure of only those PAT that are in place. If no PAT exists for a given material matter, no additional information is required.

Question number 22 (Q22) has the aim to simplify the materiality approach with the principle of "report only if applicable". This mechanism serves as a filter, allowing the organisations to report only information that is relevant to their specific context. No disclosure is required for a given datapoint if the organisation's circumstances do not align with those that would normally trigger disclosure.

This principle is especially relevant in the Basic Module, where no materiality assessment is required. In this case, all disclosures must be provided only if they are applicable. The disclosures under the BP Module are to be reported on an "if applicable" basis.

Here, there are some exceptions for BP 5 (Physical risks from climate change), 7 **(**Alignment with internationally recognised instruments), 8 **(**Processes to monitor compliance and mechanisms to address violations)**,** 9 **(**Violations of OECD Guidelines for Multinational Enterprises or the UN Guiding Principles including the principles and rights set out in the eight fundamental conventions of the ILO Declaration and the International Bill of Human Rights)**,** and 10 **(**Work-life balance), where the "if applicable" approach is replaced by a relevance-based criterion. In those cases, disclosure is expected when the topic is deemed relevant to the business and organisational context.

In this case, the ED also asks whether respondents agree with this simplified approach, justifying their answers.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Building on this regulatory and conceptual foundation, this study aims to analyse responses to EFRAG's public consultation on the VSME ED, with a specific focus on materiality principles as applied in the PAT and BP modules. In particular, we examine qualitative comments submitted in relation to Questions 20, 21, and 22 of the survey, which correspond to the following research questions:

RQ1: Do respondents agree that the language and approach to the principles of materiality are proportionate for the undertakings in scope as outlined in the VSME ED?
RQ2: Do respondents agree with the requirement to conduct a materiality analysis in order to disclose sustainability matters (as prescribed in ESRS 1)?
RQ3: Do respondents support a simplified approach to materiality?

3. Research Methodology

This study adopts a two-part methodological approach to analyse respondents' feedback on the VSME ED.
In the first part, we conducted a descriptive analysis to classify the respondents based on three key dimensions:

- Affiliation (categorised as "preparers," "users," or "others"),
- Geographical area, and
- Main sector of activity.

This classification provides an overview of the profile and diversity of the survey participants.
The second part of the analysis employs an inductive, qualitative content analysis to examine the open-ended responses to Questions 20, 21, and 22 in the ED. These questions directly address the core research objectives related to the proportionality, necessity, and simplification of materiality assessments within the VSME framework.
Specifically, we applied a descriptive thematic analysis following a multi-step process, as suggested by Neuendorf (2018). Initially, there is a step of "familiarisation", where the authors independently reviewed the responses in full to identify recurring and meaningful patterns or themes. Then, coding and theme identification are carried out. Consistent with the definition by Vaismoradi et al. (2016, p. 101), a theme is understood as "a group of repeating ideas" that, when systematised, contribute to answering the research question. This approach enabled us to determine whether there are essential aspects to investigate (Saldaña, 2016).
In the final step, a taxonomy of common arguments provided by the respondents is developed to facilitate cross-validation and synthesis (Bisogno et al., 2015; Yen et al., 2007). Accordingly, the authors collaboratively refined the themes to ensure internal consistency and theoretical relevance. This process enabled the development of a robust taxonomy of respondents' arguments. This qualitative analysis allowed for a deeper understanding of the nuances in respondents' views, extending beyond simple agreement or disagreement. By capturing both supporting and critical voices, the study highlights the perceived strengths, limitations, and areas for improvement in the ED's approach to materiality.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

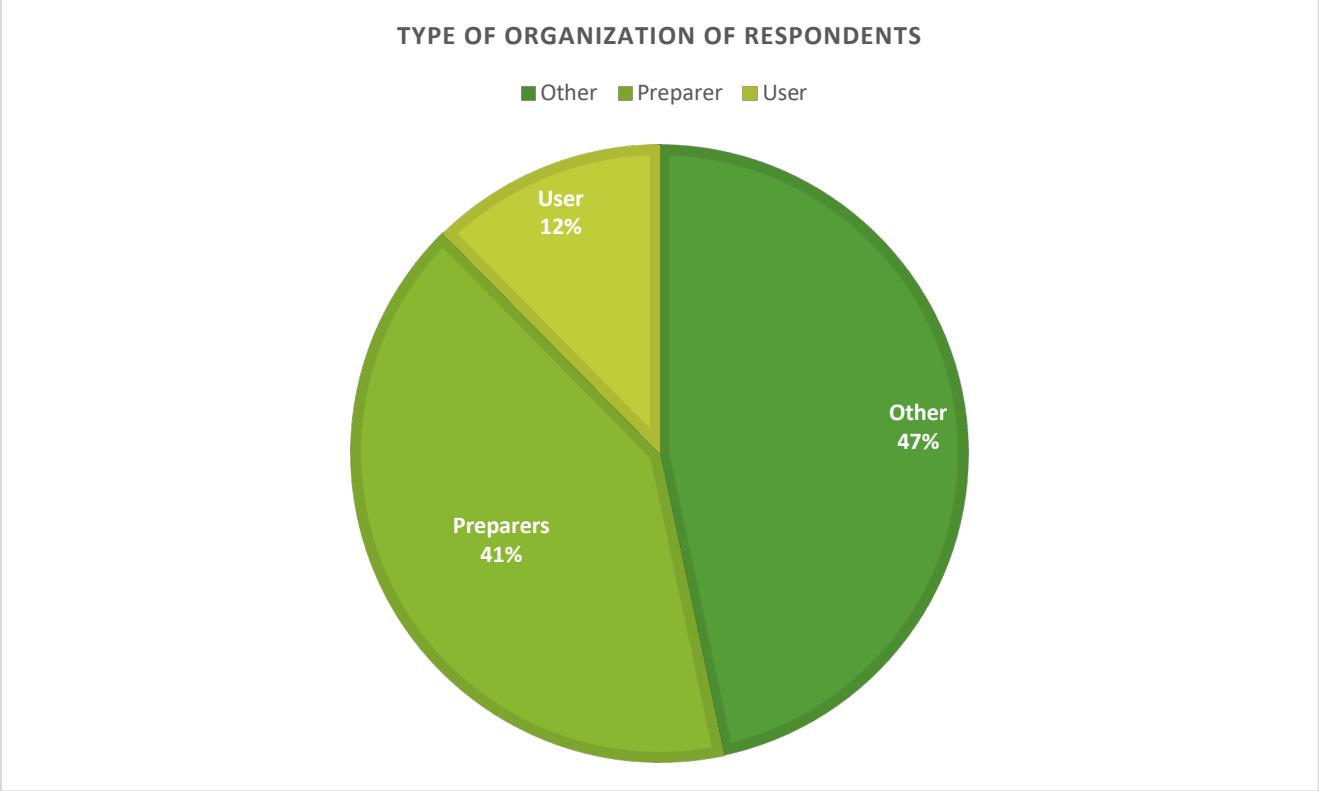
4. Findings

4.1 Descriptive Statistics

Respondents were categorised into three main groups (or "type of organisation"): preparers, users, and others. *Preparers* are those entities that intend to prepare sustainability reports in accordance with the VSME ED; *users* refer to those who utilise sustainability information, such as investors, lenders, and large companies' partners that engage with SMEs through their value chains.

The residual group, labelled *others*, includes a range of additional categories as specified in the ED. These include National or European authority/Standard Setter; Non-Government Organisation ("NGO"); Unions/Worker representatives; Academic or research institution; Accountant/Consulting services/Assurance provider; and an open-ended "Other" category, which required respondents to provide further specification. Table 1 presents the distribution of survey respondents by organisational type.

Table 1. Type of organisation of Respondents



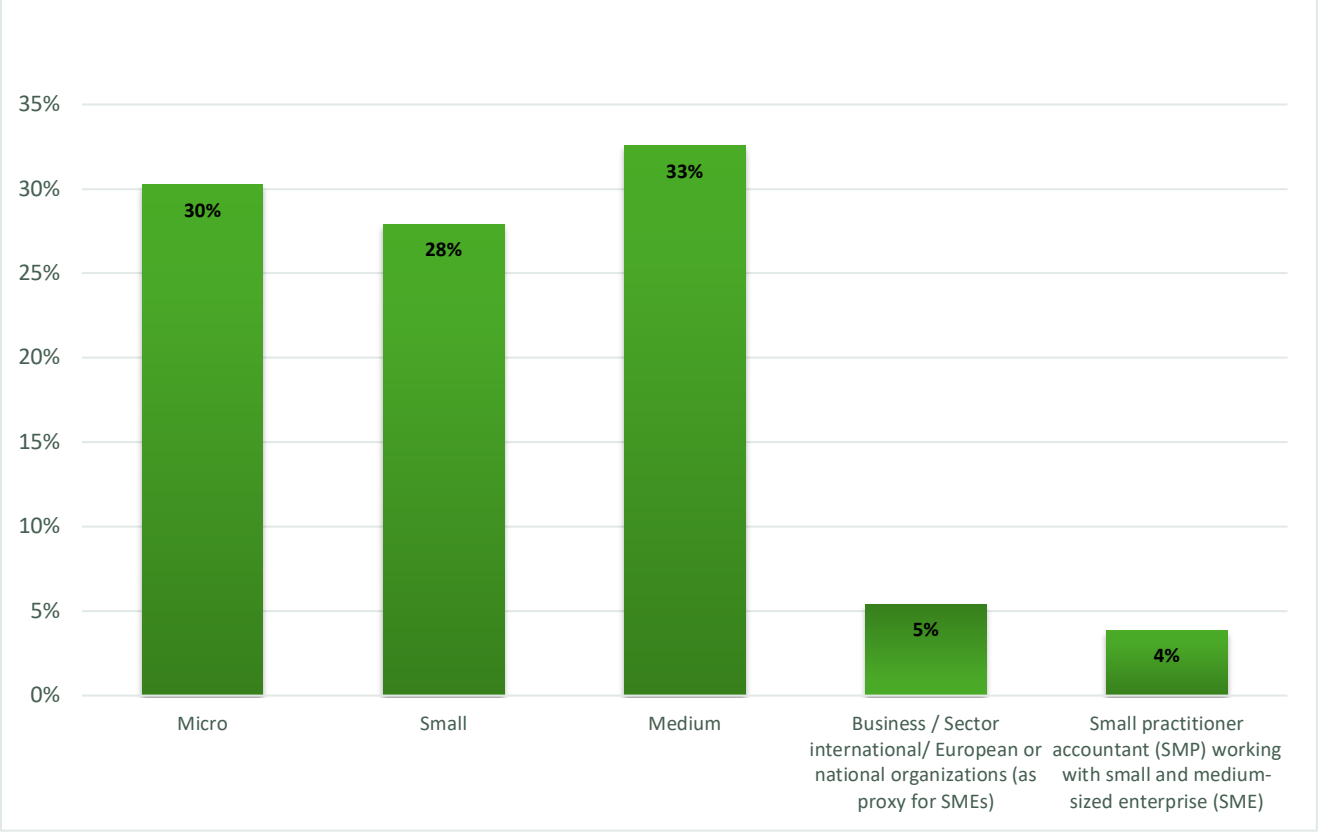
Source: Authors' elaboration

Furthermore, the ED requested additional specifications from respondents. For those identified as *preparers*, respondents were asked to indicate their organisational size: the available categories included: *Micro undertakings* (fewer than 10 employees), *Small undertakings* (10–50 employees), *Medium undertakings* (50–250 employees), *Small and Medium-sized Practice (SMP)*

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

accounting firms working with SMEs, and *business/sector organisations*—whether international, European, or national—acting as proxies for SMEs. Table 2 illustrates the detailed distribution of preparers based on these subcategories.

Table 1. Type of "Preparers"



Source: Authors' elaboration

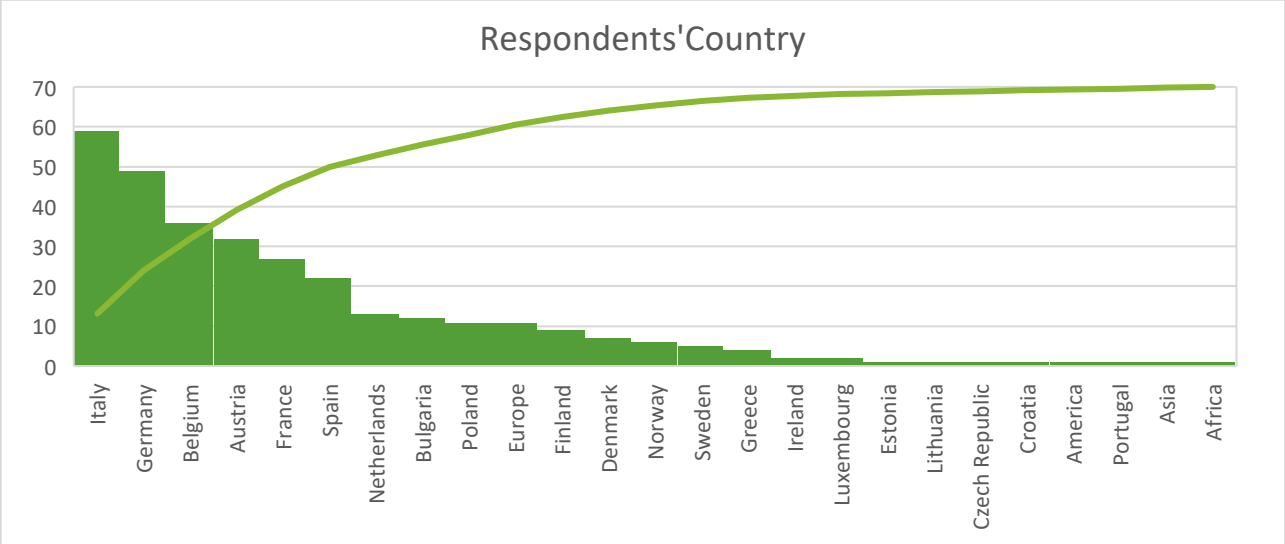
Similarly, the ED sought a more detailed classification within the *users* category. Respondents were asked whether they represented: users of sustainability reporting information (e.g., banks or investors); large undertakings acting as SME's business partners; rating agencies serving as proxies for users; public authorities utilising sustainability data in procurement or tendering processes; sectoral business organisations (international, European, or national) serving as SME proxies, with sectoral specification required; or, finally, Small and Medium sized Enterprise (SME) as SME's business partner.

Table 3 presents the distribution of ED respondents by country, accompanied by a Pareto chart. The countries are arranged in descending order based on the number of responses received. Italy recorded the highest number of respondents, followed by Germany, Belgium, Austria, France, and Spain.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

In the chart, the bars represent the absolute number of respondents per country, while the green line indicates the cumulative percentage of respondents. This dual representation helps highlight the countries that contributed most significantly to the overall respondent base. Notably, the first six countries - ranging from Italy to Spain - account for the majority of total responses.

Table 2. Respondents' Country



Source: Authors' elaboration

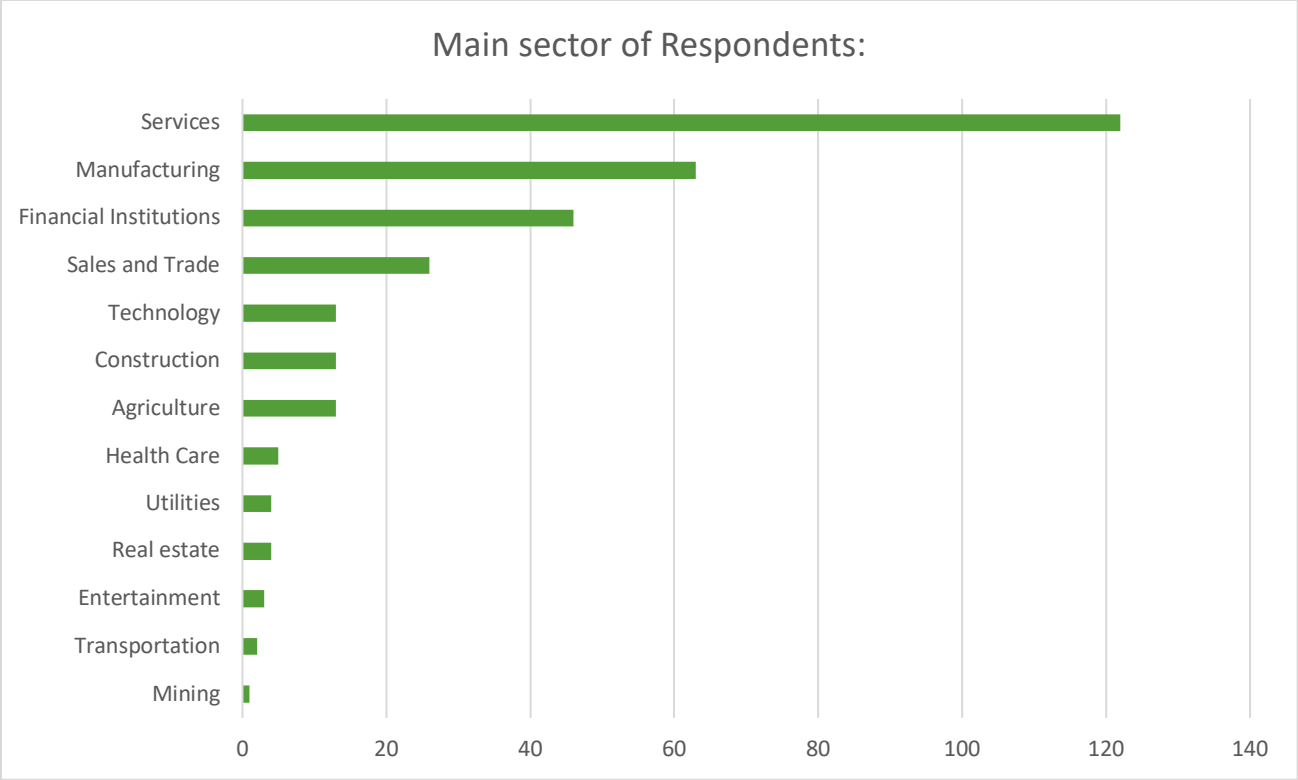
Table 4 illustrates the distribution of ED respondents across various professional sectors. The "Service" sector is the most prominently represented, with over 120 respondents - substantially exceeding the number of respondents in any other category. Following the Service sector, the "Manufacturing" and "Financial Institutions" sectors show notable participation, with approximately 65 and 55 respondents, respectively. The "Sales and Trade" and "Technology" sectors are also moderately represented.

In contrast, several sectors such as "Health Care", "Utilities", "Real Estate", "Entertainment", "Transportation", and "Mining" recorded very low participation levels.

Following the descriptive analysis, the study proceeds with a qualitative examination of the comments submitted by respondents in relation to specific questions within the ED. In particular, we accurately read the comments provided by each respondent concerning Questions 20, 21, and 22, which directly relate to the concept and application of materiality in the context of the VSME ED.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 3. Main sector of Respondents



Source: Authors' elaboration

4.2 Question 20 – Proportionality of the Language and Approach to Materiality Principles

Question 20 asked respondents if "the language and approach to the Principles of Materiality to be applied to the Narrative-PAT Module and Business Partners (BP) Module are proportionate for the undertakings in scope", regarding *Impact materiality*, *Financial materiality* and *Stakeholders and their relevance to the materiality analysis process*.

As regards the *Impact materiality,* out of 249 respondents, 61% agreed that the treatment of impact materiality was proportionate, while 39% disagreed. Among those in agreement, only 30% explained. Within these explanations, 54% offered suggestions, such as developing a system for quantifying impacts or including options to report both *positive* and negative impacts, as well as opportunities; 24% gave generic responses without elaboration; 20%, while supportive, still raised concerns regarding the limited analytical capacities of VSMEs.

Among those who disagreed (39%), 80% provided explanations. The most common issue, cited by 82%, was that the language used is overly complex and lacks sufficient guidance, illustrations, or examples. Additionally, 8% suggested allowing VSMEs to report also on positive impacts to increase their motivation to engage in voluntary reporting. One respondent noted:

> "This is a voluntary reporting standard, meaning that organisations must find motivation to report voluntarily. A lot of attention is given to negative impacts. Organisations would probably be more motivated if they could also

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

> report on their positive impacts, so that the voluntary sustainability report is something that they can be proud of." [1]

The following quotation, attributed to a single respondent, nonetheless effectively encapsulates a viewpoint shared by many. Indeed, numerous respondents observed that, for non-listed SMEs, emphasising positive aspects is considerably more effective than focusing on negative ones.

Responses to *Financial materiality* mirrored those for impact materiality, with 61% in agreement and 39% in disagreement (n = 243). Among those who agreed, only 26% provided an explanation for their position. Of these, 33% proposed suggestions such as harmonising criteria and terminology, providing step-by-step guidance, or including templates; another 33% expressed concerns about complexity and the limited resources of VSMEs; 18% gave vague or generic responses, and 10% referred to previous comments without elaboration.

Among those who disagreed (39%), 72% provided explanations for their views. Similar to *Impact materiality*, the primary concern (76%) was the complexity and lack of accessible language. Many called for additional tools and templates. A smaller group (16%) did not provide a specific explanation, instead referring to earlier responses.

As regards the last part of the question*, Stakeholders and their relevance to the materiality analysis process*, this component received slightly fewer responses (n = 229). Agreement was higher at 72%, while 28% disagreed.

Among those who agreed, only 20% provided further elaboration. Of those: 58% provided suggestions such as clearer guidance or examples or emphasised the importance of stakeholder engagement ("It's important to include all the stakeholders in this work as you can see which issues they are most concerned about"; "We believe that stakeholders should be given a mandatory place in the reporting"; "Stakeholders are relevant to make a double materiality analysis"); 15% warned that SMEs may lack the capacity to conduct stakeholder analysis without substantial support; 9% gave generic responses, and another 9% referred to previous answers [2].

Among the 28% who disagreed, 85% provided reasoning. Unlike the previous two cases, the main concern here was not the complexity of the language (35%), but rather ambiguity in how SMEs are expected to identify and engage stakeholders (45%). One respondent remarked:

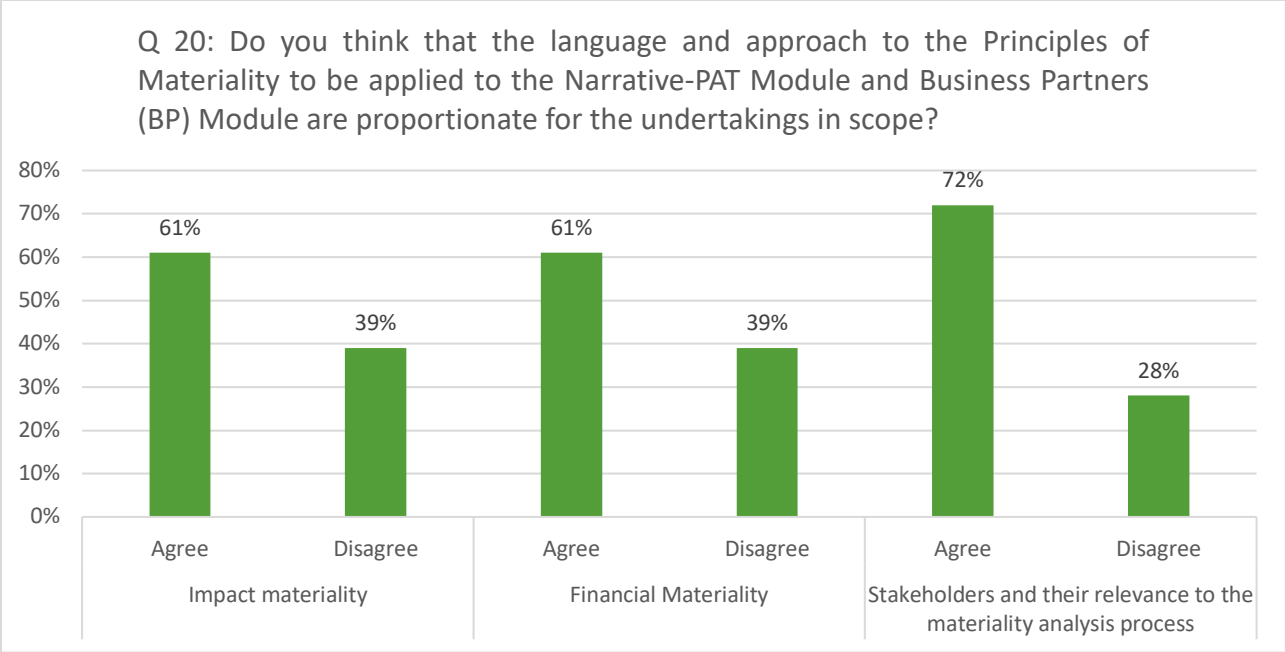
> "Support is necessary for stakeholder involvement, as many SMEs find this aspect challenging. Practical suggestions, like utilising newsletters to engage certain stakeholder groups or implementing complaints mechanisms and feedback channels, could greatly assist SMEs in this regard." [3]

Table 5 summarises the percentages of agreement/disagreement of respondents about Q20.

[1] Regarding the other answers: 1% did not specifically explained their answer by referring to responses provided in previous point while the remaining 9% provided heterogeneous answers.
[2] The remaining 9% provided heterogeneous answers.
[3] Regarding the other answers: 15% did not specifically explained their answer by referring to responses provided in previous point while the remaining 5% provided heterogeneous answers.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Table 4. Results in % for question 20



Source: Authors' elaboration

4.3 Question 21 – Requirement to Perform a Materiality Analysis

Question 21 states that "The VSME ED requires performing a materiality analysis to disclose which of the sustainability matters listed in Annexe B of VSME ED[4] (which is the same as AR 16 of ESRS 1 General requirements) are material to the undertaking. Therefore, users will understand for which material matters the undertaking does not have Policies, Actions and Targets (PAT) in place. This approach (like for ESRS Set 1) is designed to have a reliable depiction of what the undertaking is doing to address sustainability matters, avoiding greenwashing. At the same time, this approach only requires reporting the PAT (Policies, Actions and Targets) that the undertaking has in place. No information is required when they have no PAT in place for a material matter (in addition to the list of material matters itself)" and asks respondents if they agree with this approach.

Out of 251 respondents, 78% agreed with the approach (as shown in table 6). 46% of those who agreed provided explanations. Within this group: 40% agreed conditionally, requesting clearer terminology and a simplified process; 34% expressed strong support, describing materiality as essential for strategic planning and credible sustainability reporting:

> "This approach requires a useful analysis by the undertakings. This analysis serves as the basis for any future improvements. In conclusion, this approach is likely to generate new positive behaviours and policies."
>
> "It helps to focus on the relevant topics and reduce the time needed to make the disclosure."
>
> "Materiality is a good tool to develop strategies."

[4] For List of sustainability matters, see Appendix B in https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/VSME%20ED%20January%202024.pdf

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

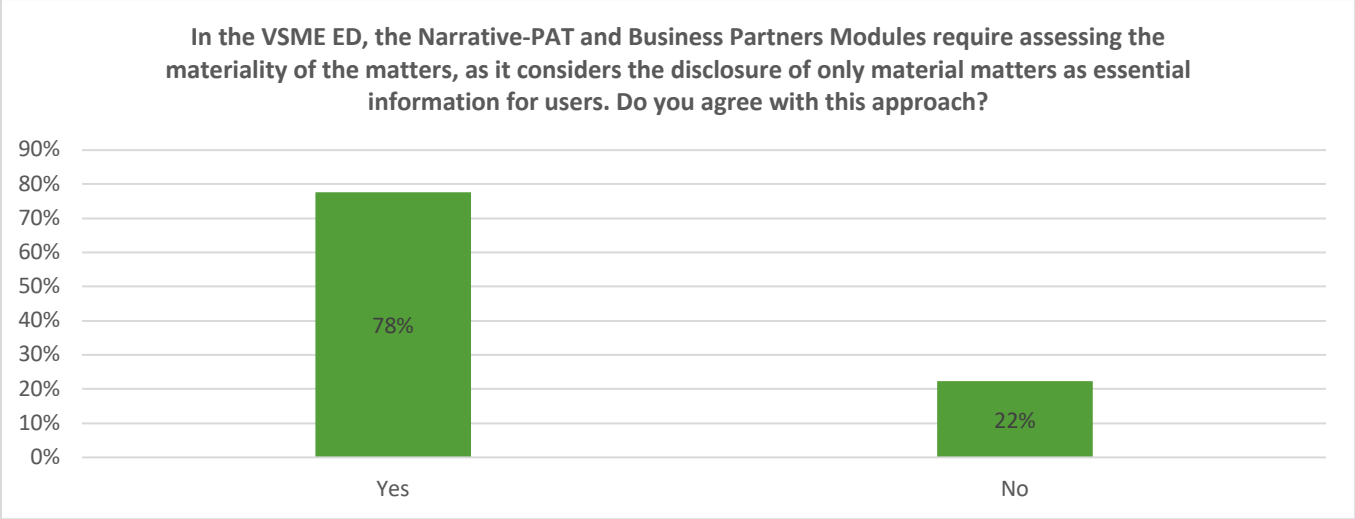
"Yes, this will give the organisation insights on what topics are important for them in their current strategy to maybe focus on in the upcoming years. This also gives the market and information users insights on what topics are really pertinent for the sector."

9% explicitly noted the role of this method in preventing greenwashing [5]. Among the 22% who disagreed, 60% argued that the analysis is too abstract and complex for SMEs, citing high time and resource demands:

"It will be a complicated and costly exercise and will discourage SMEs from using the VSME.",

while 16% highlighted the lack of clarity, particularly in terminology and implementation steps [6].

Table 5. Results in % for question 21



Source: Authors' elaboration

4.4 Question 22 – Simplified "If Applicable" Approach

Question 22 states that "*As a way to simplify the materiality approach, whenever possible, the notion of "report only if applicable" has been introduced. This filters information to be reported by undertakings based on relevance. No disclosure is expected for a specific datapoint, when the undertaking's circumstances are different from those that would trigger disclosure of that specific datapoint, as described by the relevant provision in VSME ED. This is particularly important for the Basic Module, where no materiality analysis is foreseen and all the disclosures are to be reported, if applicable. Disclosures in the Business Partners module are to be reported are to be reported if they are applicable and for BP 5,7, 8, 9, 10 (for which the*

[5] Regarding the other answers: 6% did not specifically explained their answer by referring to responses provided in previous point while the remaining 11% provided heterogeneous answers.

[6] Regarding the other answers: 6% did not specifically explained their answer by referring to responses provided in previous point while the remaining 10% provided heterogeneous answers.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

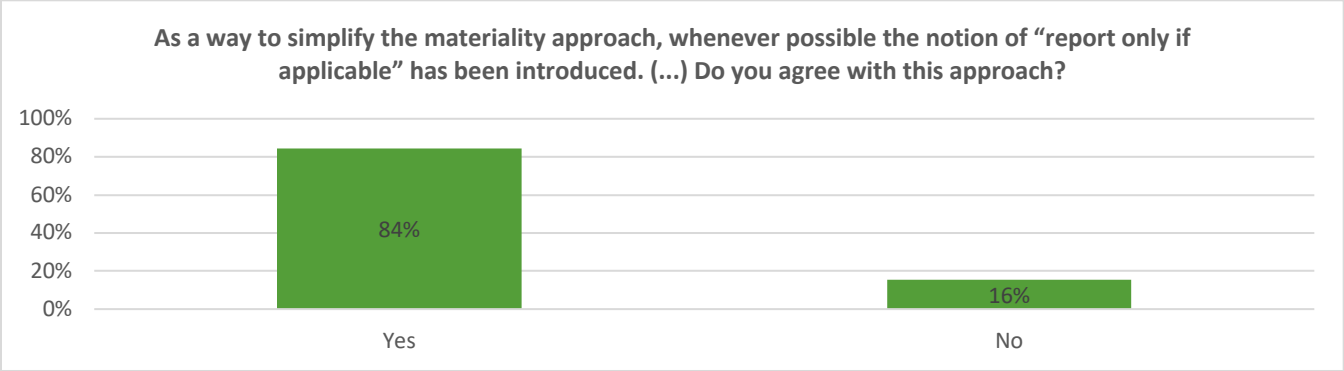
"if applicable" approach would not work) if they are relevant to the undertaking's business and organisation" and asks respondents if they agree with this approach.

Out of 250 respondents, 84% agreed with the approach (as shown in table 7). Among those, 50% provided explanations: 14% noted that the approach simplifies disclosure;15% simply stated "Yes" without elaboration; 22% called for a clearer definition of "if applicable"; 37% offered conditional agreement, raising concerns or suggestions:

> "Yes, but the 'if-applicable' concept also raises questions among potential users and requires explanation."
>
> "We agree with this approach as long as it is complied with by the value chain participants."
>
> "We agree with the general approach. But we note that some data points are impossible for SMEs to capture." [7]

Among the 16% who disagreed, 62% cited a lack of clarity in terms such as "applicable," "relevant," and "material," and emphasised the need for clearer definitions ("It would be preferable to better define what "applicable" means ", "I don't really understand the distinction between "if applicable" and "if relevant"", "The relation between "not applicable" and "material" is not clear. Guidance on order and content of both is absolutely necessary") and structured guidance. At the same time, 15% argued that the approach introduces unnecessary complexity, particularly due to references to international legal instruments ("Mixing the 'if-applicable' approach and the materiality analysis is incomprehensible and overburdens SMEs.") [8].

Table 6. Results in % for question 22



Source: Authors' elaboration

5. Discussions

The results of the qualitative analysis show substantial agreement among respondents regarding the approach proposed by EFRAG, confirming affirmative answers to all three research questions:

- RQ1: The majority of respondents believe that the language and approach to the principles of materiality are proportionate to the target companies involved.

[7] Regarding the other answers: 2% did not specifically explained their answer by referring to responses provided in previous point while the remaining 10% provided heterogeneous answers.

[8] Regarding the other answers: 6% did not specifically explained their answer by referring to responses provided in previous point while the remaining 18% provided heterogeneous answers.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

- RQ2: There is broad consensus on the obligation to conduct a materiality analysis to identify relevant topics and make sustainability information more credible and strategic.
- RQ3: The simplified approach based on the "if applicable" principle was widely approved, although with requests for terminological clarification.

In particular, among those in favour, there was strong support for carrying out a materiality analysis (Q21) as materiality is considered fundamental for the credibility of the company itself, a concept that is in line with what is recognised in the literature for sustainability reporting, which can contribute to improving the reputation of SMEs (Williams & Schaefer, 2013). However, a more in-depth analysis of the qualitative responses reveals a more nuanced picture.

In fact, despite the overall strong support, a clear and repeated request emerges across the board: the need for greater clarity and simplification of the language, especially in defining the concepts of "materiality," "applicability," and "relevance."

Indeed, the perception of a lack of clarity, usability and accessibility of materiality provisions emerged strongly among both supportive and opposing respondents; even many supportive respondents raised concerns about the complex language, the need for practical guidelines and the resource constraints faced by SMEs. For example, it was highlighted that the language used on materiality, particularly in the context of stakeholder engagement and impact assessment, was often too abstract or technical for SMEs.

This aligns with the long-standing literature emphasis on the limited capacity (both in terms of resources and manpower) of smaller entities to adopt systems for reporting on sustainability practices (Bos-Brouwers, 2010).

Many respondents called for simpler tools, concrete examples, templates and sector-specific illustrations to make the concept of materiality more applicable. The need to consider not only negative impacts but also positive contributions, which could increase the motivation of SMEs to voluntarily report, was also often highlighted.

In the authors' opinion, the regulatory decision to remove the requirement of double materiality in the final version of the VSME standard appears only partially consistent with the feedback received from participants.

While many respondents conditionally expressed support for materiality—linking their agreement to the need for simplification and clearer terminology—the survey results nonetheless reveal a predominantly positive perception of materiality and its relevance for SMEs.

The choice to abandon mandatory double materiality was thus motivated less by the binary (largely favourable) responses and more by recognition of the practical barriers that SMEs still face, which remain significant and, in many cases, insurmountable. Instead of addressing respondents' calls for clearer definitions, operational tools (guidelines, models, templates), and simplified language, the standard opted for the renunciation of the principle itself. This raises questions about whether the decision fully captured the spirit of the survey responses, as many of the expressed requests for clarification were in fact the main motivation behind unfavourable positions.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

6. Conclusions

This study aimed to analyse the responses to the online survey on the ED of the VSME, as proposed by EFRAG, with a specific focus on how the concept of materiality is perceived and interpreted in the context of non-listed SMEs.

The results confirm broad support for the EFRAG proposal on materiality in the VSME context, albeit accompanied by significant concerns regarding complexity, terminology, and resource constraints. The findings highlight a tension between recognising materiality as a fundamental principle and the operational challenges that SMEs encounter in applying it effectively.

A crucial element of the original VSME Exposure Draft was its three-module architecture (Basic, PAT, and Business Partner modules), which allowed a progressive and proportional approach to sustainability reporting.

The survey results demonstrated that, while respondents asked for simplification and clearer definitions, the principle of materiality itself was considered both relevant and essential for SMEs, particularly within the PAT and BP modules.

The final VSME standard, however, abandoned this three-module structure along with the requirement of double materiality in the name of simplifying the framework.

This outcome underscores a central paradox: while the survey highlighted the obstacles faced by SMEs in applying materiality (e.g., lack of resources, technical complexity), it also confirmed the broad perception of its indispensability. The regulatory response, however, has been to eliminate materiality instead of making it more accessible, thus weakening the potential of the VSME standard to foster credible and decision-useful sustainability reporting.

While this decision addresses feasibility concerns for smaller entities, it also represents a missed opportunity to implement a flexible and proportionate framework that many respondents supported in principle. The removal of the modular structure risks undermining the possibility of a stepwise adoption path, tailored to the varying levels of SMEs' sustainability maturity and external demands.

The study is not without limitations. First, many participants did not provide explanations for their answers, thereby reducing the depth of the analysis. Second, since the geographical origin of the respondents is concentrated in a few countries (e.g. Italy, Germany), the conclusions of this work are not widely generalisable. Third, the analysis was based exclusively on the examination of the survey and was not integrated with additional tools (e.g. interviews), which could have been useful to complete the collected data.

Looking ahead, this research underlines the need for sustainability standards that are not only conceptually robust but also operationally feasible. If SMEs are to be meaningfully engaged in sustainability reporting, future revisions will need to reintroduce materiality, possibly through a modular, stepwise approach, while ensuring that simplified language, practical tools, and sector-specific guidance make it realistically implementable. Only in this way can the VSME framework strike a balance between accessibility and credibility, thereby avoiding the risk of reducing sustainability disclosures to a mere compliance exercise.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

References

Abhayawansa, S. (2022). Swimming against the tide: back to single materiality for sustainability reporting. *Sustainability Accounting, Management and Policy Journal*, *13*(6), 1361-1385. https://doi.org/10.1108/SAMPJ-07-2022-0378

Adams, C. A., Alhamood, A., He, X., Tian, J., Wang, L., & Wang, Y. (2021). *The double-materiality concept. Application and issues*, published by the Global Reporting Initiative.

Allgeier, S., & Feldmann, R. (2023). CSRD sustainability reporting for non-listed SMEs: European regulators remain challenged. *European Company and Financial Law Review*, *20*(3), 438-446.

Alshawi, S., Missi, F., & Irani, Z. (2011). Organisational, technical and data quality factors in CRM adoption—SMEs perspective. *Industrial Marketing Management*, *40*(3), 376-383.

Appiah-Kubi, E. (2024). Management knowledge and sustainability reporting in SMEs: The role of perceived benefit and stakeholder pressure. *Journal of Cleaner Production*, 434, 140067.

Baumann-Pauly, D., Wickert, C., Spence, L. J., & Scherer, A. G. (2013). Organizing corporate social responsibility in small and large firms: Size matters. Journal of Business Ethics, 115(4), 693–705. https:// doi.org/ 10. 1007/ s1055 1-013-1827-7

Baumüller, J., & Sopp, K. (2021). Double materiality and the shift from non-financial to European sustainability reporting: review, outlook and implications. *Journal of applied accounting research*, *23*(1), 8-28.

Beck, C., Frost, G., & Jones, S. (2018). CSR disclosure and financial performance revisited: A cross-country analysis. *Australian Journal of Management*, 43(4), 517-537. https://doi.org/10.1177/0312896218771438

Bisogno, M., Santis, S., & Tommasetti, A. (2015). Public-Sector consolidated financial statements: An analysis of the comment letters on IPSASB's exposure draft no. 49. *International Journal of Public Administration*, *38*(4), 311-324. https://doi.org/10.1080/01900692.2015.999605

Bos-Brouwers, H. E. J. (2010). Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice. *Business strategy and the environment*, *19*(7), 417-435. https://doi.org/10.1002/bse.652

Burke, S., & Gaughran, W. F. (2007). Developing a framework for sustainability management in engineering SMEs. *Robotics and Computer-Integrated Manufacturing*, 23(6), 696-703.

Carvajal, M., Nadeem, M., & Zaman, R. (2022). Biodiversity disclosure, sustainable development and environmental initiatives: does board gender diversity matter?. *Business Strategy and the Environment*, *31*(3), 969-987. https://doi.org/10.1002/bse.2929

Ciliberti, F., De Haan, J., De Groot, G., & Pontrandolfo, P. (2011). CSR codes and the principal-agent problem in supply chains: four case studies. *Journal of Cleaner Production*, *19*(8), 885-894.

Corazza, L. (2018). Small business social responsibility: the CSR4UTOOL web application. *Journal of Applied Accounting Research*, *19*(3), 383-400.

Das, M., Rangarajan, K., & Dutta, G. (2020). Corporate sustainability in small and medium-sized enterprises: A literature analysis and road ahead. *Journal of Indian Business Research*, *12*(2), 271-300.

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

De Villiers, C., & Dimes, R. (2023). Will the formation of the international sustainability standards board result in the death of integrated reporting?. *Journal of Accounting & Organizational Change*, *19*(2), 279-295. https://doi.org/10.1108/JAOC-05-2022-0084

Deloitte. (2021). *Reporting of non-financial information* (p. 4). Deloitte. https://www2.deloitte.com/content/dam/Deloitte/be/Documents/audit/DT-BE-reporting-of-non-financial-info.pdf

Dinh, T., Husmann, A., & Melloni, G. (2023). Corporate sustainability reporting in Europe: A scoping review. *Accounting in Europe*, *20*(1), 1-29. Dinh, T., Husmann, A., & Melloni, G. (2023). Corporate sustainability reporting in Europe: A scoping review. *Accounting in Europe*, *20*(1), 1-29.

Eccles, R.G., Krzus, M.P., Rogers, J. & Serafeim, G. (2012). The need for sector-specific materiality and sustainability reporting standards, *Journal of Applied Corporate Finance*, *24*(2), 65-71, doi: 10.1111/j.1745-6622.2012.00380.x.

EFRAG (2024). EFRAG IG 1: materiality assessment implementation guidance, available at: https://www.efrag.org/Assets/Download?assetUrl5/sites/webpublishing/SiteAssets/

Erin, O. A., Bamigboye, O. A., & Oyewo, B. (2022). Sustainable development goals (SDG) reporting: an analysis of disclosure. *Journal of Accounting in Emerging Economies*, *12*(5), 761-789. https://doi.org/10.1108/JAEE-02-2020-0037

European Commission (2024). Annual report on European SMEs 2024/2025.

Galli, D., Torelli, R., & Caccialanza, A. (2024). Sustainability performance and sustainability reporting in SMEs: A love affair or a fight? *Journal of Management & Organization*, *30*(3), 574–599.

Giner, B. & Luque-Vílchez, M. (2022). A commentary on the 'new' institutional actors in sustainability reporting standard-setting: a European perspective, *Sustainability Accounting, Management and Policy Journal*, *13*(6), 1284-1309. https://doi.org/10.1108/SAMPJ-06-2021-0222

Global Reporting Initiative (2020). *A short introduction to the GRI Standards*. Amsterdam: GRI. Retrieved September 16, 2025, from https://www.globalreporting.org/media/wtaf14tw/a-short-introduction-to-the-gri-standards.pdf

Jenkins, H. (2004). Corporate social responsibility and the mining industry: Conflicts and constructs. *Corporate Social Responsibility and Environmental Management, 11*(1), 23–34. https:// doi. org/ 10. 1002/csr. 50

Jenkins, H. (2006). Small business champions for corporate social responsibility. *Journal of business ethics*, *67*, 241-256.

Jørgensen, S., Mjøs, A., & Pedersen, L. J. T. (2022). Sustainability reporting and approaches to materiality: tensions and potential resolutions. *Sustainability Accounting, Management and Policy Journal*, *13*(2), 341-361. https://doi.org/10.1108/SAMPJ-01-2021-0009

KPMG (2024). Survey on sustainability reporting. https://kpmg.com/xx/en/our-insights/esg/the-move-to-mandatory-reporting.html

La Torre, M., Sabelfeld, S., Blomkvist, M. & Dumay, J. (2020). Rebuilding trust: sustainability and non-financial reporting and the European union regulation, *Meditari Accountancy Research*, *28*(5), 701-725. https://doi.org/10.1108/MEDAR-06-2020-0914

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Lima Jr, O., Fernandes, G., & Tereso, A. (2023). Benefits of adopting innovation and sustainability practices in project management within the SME context. *Sustainability*, *15*(18), 13411.

Martins, A., Branco, M. C., Melo, P. N., & Machado, C. (2022). Sustainability in small and medium-sized enterprises: A systematic literature review and future research agenda. *Sustainability*, *14*(11), 6493.

McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal*, 21(5), 603–609.

Neuendorf, K. A. (2018). Content analysis and thematic analysis. In *Advanced research methods for applied psychology* (pp. 211-223). Routledge.

O'Reilly, S., Mac An Bhaird, C., Gorman, L., & Brennan, N. M. (2024). Accounting practitioners' perspectives on small-and medium-sized enterprises' environmental sustainability reporting. *Journal of Applied Accounting Research*, *26*(6), 26-46. https://doi.org/10.1108/JAAR-08-2023-0250

O'Reilly, S., Mac An Bhaird, C., Gorman, L., & Brennan, N. M. (2025). Accounting practitioners' perspectives on small-and medium-sized enterprises' environmental sustainability reporting. *Journal of Applied Accounting Research*, *26*(6), 26-46.

Oduro, S., & Haylemariam, L. G. (2025). Effect of social and environmental sustainability on SME competitiveness: a meta-analytic review. *Management Review Quarterly*, 1-32.

Oll, J., Spandel, T., Schiemann, F., & Akkermann, J. (2025). The concept of materiality in sustainability reporting: from essential contestation to research opportunities. *Sustainability Accounting, Management and Policy Journal*, *16*(2), 321-350. https://doi.org/10.1108/SAMPJ-03-2024-0296

Ortiz-Martínez, E., & Marín-Hernández, S. (2021). European SMEs and non-financial information on sustainability. *International Journal of Sustainable Development & World Ecology, 29*(2), 112–124. https://doi.org/10.1080/13504509.2021.1929548

Ortiz-Martínez, E., & Marín-Hernández, S. (2024). Sustainability information in European small-and medium-sized enterprises. *Journal of the Knowledge Economy*, *15(*2), 7497-7522.

Ortiz, E., Marín, S., & Thompson, P. (2024). The role of small- and medium-sized practices in the sustainable transition of SMEs: Sustainable transition and professionals. *Environment, Development and Sustainability*, 26(8), 19299–19323.

Pigatto, G., Cinquini, L., Tenucci, A., & Dumay, J. (2023). Disclosing value creation in integrated reports according to the six capitals: a holistic approach for a holistic instrument. *Sustainability Accounting, Management and Policy Journal*, *14*(7), 90-123. https://doi.org/10.1108/SAMPJ-11-2021-0493

Pizzi, S., & Coronella, L. (2024). Are listed SMEs ready for the corporate sustainability reporting directive? Evidence from Italy. *Business Ethics, the Environment & Responsibility*. https://doi.org/10.1111/beer.12736

Pizzi, S., Principale, S. & Nuccio, E. D (2023). Material sustainability information and reporting standards. Exploring the differences between GRI and SASB, *Meditari Accountancy Research*, *31*(6), 1654-1674. https://doi.org/10.1108/MEDAR-11-2021-1486

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index

Pozzoli, M., Paolone, F., De Nuccio, E., & Tiscini, R. (2024). Does financial materiality judgement matter in reporting intellectual capital? A systematic literature review and future research trends. *Journal of Intellectual Capital*, *25*(7), 87-108. https://doi.org/10.1108/JIC-03-2024-0083

Raith, D. (2023). The contest for materiality. What counts as CSR?, *Journal of Applied Accounting Research*, *24* (1), 134-148. https://doi.org/10.1108/JAAR-04-2022-0093

Saldaña, J., & Omasta, M. (2016). Qualitative research: Analyzing life. *Sage Publications*.

Setia, N., Abhayawansa, S., Joshi, M., & Wasantha Pathiranage, N. (2024). Shifting perspectives: unveiling the dual nature of sustainability materiality in integrated reports. *Meditari Accountancy Research*, *32*(4), 1291-1323. https://doi.org/10.1108/MEDAR-08-2023-2128

Setyaningsih, S., Widjojo, R., & Kelle, P. (2024). Challenges and opportunities in sustainability reporting: A focus on small and medium enterprises (SMEs). *Cogent Business & Management*, 11(1), 2298215.

Steidle, C., Ostojic, S., Achterfeldt, S., & Traverso, M. (2025). Small players, big impact? Unveiling practices and challenges of sustainability reporting by German SMEs. *Discover Sustainability*, *6*(1), 1-21.

U.S. Supreme Court (1988). Basic, inc. v. Levinson: 485 U.S. 224.

Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis. Journal of Nursing Education and Practice, 6(5), 100-110. doi.org/10.5430/jnep.v6n5p100

Williams, S., & Schaefer, A. (2013). Small and medium-sized enterprises and sustainability: Managers' values and engagement with environmental and climate change issues. *Business Strategy and the environment*, *22*(3), 173-186. https://doi.org/10.1002/bse.1740

Williamson, D., Lynch-Wood, G., & Ramsay, J. (2006). Drivers of environmental behaviour in manufacturing SMEs and the implications for CSR. *Journal of business ethics*, *67*, 317-330.

Yen, A. C., Hirst, D. E., & Hopkins, P. E. (2007). A content analysis of the comprehensive income exposure draft comment letters. *Research in Accounting Regulation*, *19*, 53-79. https://doi.org/10.1016/S1052-0457(06)19003-7

European Journal of Social Impact and Circular Economy - ISSN: 2704-9906
DOI: 10.13135/2704-9906/12283 Published by University of Turin http://www.ojs.unito.it/index.php/ejsice/index