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Non-implementation as a driver of circular economy evolution

A Luhmannian systems-theoretical perspective

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Abstract

The circular economy (CE) has emerged as a transformative paradigm for addressing the intertwined crises of environmental degradation and resource scarcity, grounded in the moral principles of intergenerational equity, environmental sustainability, and shared responsibility. However, in the European Union (EU), the development of the CE has been hindered by technological, economic, regulatory, and cultural barriers, leaving its compelling moral case significantly under-implemented. Drawing on Luhmann's systems theory, this forum article reconceptualizes the moral case for the CE as a normative expectation—a societal "ought" that retains its validity even when violated. These violations, we argue, function as productive irritations, catalyzing the evolution of the CE by driving innovation, societal critique, and gradual adaptation. We analyze this evolutionary trajectory by distinguishing three stages of CE development in the EU: (i) semantic articulation, (ii) structural consolidation, and (iii) emergent alignment of semantics and structures. Our argument highlights the importance of embracing the gaps between normative aspirations and practical realities as a vital resource for advancing CE development, offering valuable insights for scholarship, policymakers, and businesses.

KEYWORDS
business case, circular economy, governance, moral case, Niklas Luhmann, system theory

1 | INTRODUCTION

The circular economy (CE) has emerged as a transformative paradigm for addressing the entwined crises of environmental degradation and resource scarcity (e.g., Friant et al., 2020; Geissdoerfer et al., 2017; Kirchherr et al., 2023a; Mignacca et al., 2025; Schultz & Rhein, 2024), predicated upon the ambitious goal of decoupling economic activity from resource consumption (e.g., Kirchherr, 2022; Kjaer et al., 2019; Schultz & Pies, 2024). As a cornerstone of global sustainability efforts—particularly within the European Union (EU)—the CE envisions a departure from the conventional "take-make-dispose" linear model of economic production and consumption, advocating instead for an economic order predicated on 10Rs of CE i.a. refuse, rethink, etc. (Morseletto, 2020; Reike et al., 2018). At its heart, the CE aspires to harmonize economic growth with ecological boundaries (Schultz, 2022), emphasizing the continuous regeneration and reuse of material flows as a means of minimizing waste and mitigating environmental pollution (Kirchherr et al., 2023b). Fundamentally, the CE is underpinned by moral principles of intergenerational equity, environmental sustainability, and shared responsibility (Mies & Gold, 2021; Palm et al., 2024; Valencia et al., 2023), demanding that businesses, governments, and citizens

collectively assume an ethical duty to curtail environmental harm, safeguard finite resources, and alleviate the ecological burdens bequeathed to future generations (e.g., Corvellec et al., 2022; Valenzuela & Böhm, 2017).

In practical terms, however, the ambitious vision of the CE has consistently outpaced its implementation, which remains hampered by an array of technological, economic, regulatory, and cultural barriers (e.g., de Jesus & Mendonça, 2018; Grafström & Aasma, 2021; Kirchherr et al., 2018; Paletta et al., 2019; Schultz & Reinhardt, 2022, 2023; Tura et al., 2019). These barriers have not only slowed the operationalization of CE principles but have also generated uncertainty regarding the extent to which its ambitious objectives can realistically be achieved (e.g., Skene, 2018). For some scholars, this uncertainty has presented a conceptual ambiguity (e.g., Corvellec et al., 2022; Leipold et al., 2023) or even as a fundamental weakness in the CE theory (Mignacca et al., 2025). Such critiques have prompted pointed questions concerning CE's foundational assumptions (Skene, 2018), the legitimacy of its purported social benefits (e.g., Millar et al., 2019; Valencia et al., 2023), and its tangible contributions to environmental sustainability (e.g., Blum et al., 2020; De Man & Friege, 2016).

Yet, for other scholars, this very lack of clarity has served as fertile ground for the development of diverse CE narratives, which reflect the heterogeneity of perspectives surrounding the concept's feasibility and potential. As Leipold et al. (2023) observe, there are three major narratives in the CE discourse: (1) optimistic narrative, (2) reformist narrative, and (3) skeptical narrative. These three narratives vary significantly in tone and orientation.

(1) The optimistic narrative casts the CE as a transformative agenda, urging bold and radical measures to advance its implementation. Inspired by the optimistic narrative, a number of scholars have explored radical strategies for CE implementation (e.g., Bocken & Short, 2020; Bocken et al., 2020). However, such strategies are not without contention, as other scholars have raised concerns regarding their potentially disruptive social implications, which remain insufficiently examined in the current literature (e.g., Amorim de Oliveira, 2021; Mies & Gold, 2021; Palm et al., 2024; Repp et al., 2021; Valencia et al., 2023). (2) The reformist narrative, by contrast, adopts a more incremental and pragmatic stance, emphasizing feasible, stepwise approaches to systemic change (cf. Leipold et al., 2023). (3) Meanwhile, the skeptical narrative raises profound doubts about whether the CE, as currently conceived, can ever be implemented in a manner that aligns with its lofty moral principles (cf. Leipold et al., 2023). This skeptical narrative is primarily animated by doubts regarding the compatibility of CE development with the principles of economic efficiency and growth. Scholars advancing this perspective question whether the CE can truly align with the imperatives of capitalist economies, which are often predicated on perpetual expansion and resource-intensive production. Against this backdrop, a pivotal point of contention within the CE literature concerns the feasibility of decoupling economic growth from environmental degradation. While proponents of CE remain optimistic about the possibility of achieving such decoupling (Kirchherr, 2022; Schultz & Pies, 2024; Schultz et al., 2024a), an increasingly influential body of post-growth scholarship casts doubt on this assumption, highlighting the inherent limitations of resource efficiency as a pathway to sustainability (Siderius & Poldner, 2021; Siderius & Zink, 2023; Zink & Geyer, 2017). For instance, Zink and Geyer (2017) caution against the so-called "circular economy rebound" effect, wherein gains in resource efficiency paradoxically stimulate greater overall resource consumption, raising the prospect that, without more radical systemic change, the CE could merely serve as an iteration of the very linear economic model it seeks to replace (Blum et al., 2020; Corvellec et al., 2022). Viewed through the lens of business ethics, this debate reflects the potentially limited scope of the business case for CE. While the business case emphasizes the alignment of CE practices with profitability and operational efficiency, such a focus risks falling short of the moral case for CE, which is grounded in its broader ethical principles and aspirations (see for a detailed discussion Schultz et al., 2025a, 2025b). This divergence exposes CE's fundamental implementation difficulty, as the business case—tethered to economic imperatives—fails to fully encapsulate or operationalize CE's normative ambitions.

In this forum article, we approach this implementation difficulty through the lens of Niklas Luhmann's social systems theory (e.g., Luhmann, 2012, 2013, 2020), a perspective that remains unconventional within the existing CE literature (see, e.g., Gonser & Hinske, 2023; Neisig, 2022, 2025; Yhdego, 2021). Specifically, we frame the business case and the moral case as instances of what Luhmann termed "cognitive expectations" and "normative expectations," respectively. This theoretical lens enables a nuanced understanding of the dynamics between these two cases, reframing the perceived gap between them as a productive tension rather than a simple failure of implementation. Adopting a Luhmannian perspective allows us to illuminate several positive effects of the non-implementation of the moral case, effects that include exposing structural barriers to circularity, stimulating societal discourse and innovation, and facilitating gradual adaptation across differentiated societal systems. While this idea may initially appear counterintuitive, if our argument is valid, the failure to implement the moral case does not indicate a conceptual weakness or practical deficiency; rather, it serves as a catalyst for systemic evolution. Building upon this insight, we propose a dynamic framework of three evolutionary stages in the development of the CE within the EU, thereby enriching prior scholarship that has emphasized the evolutionary nature of CE transitions (e.g., Chedrak et al., 2023; Hartley et al., 2020). We differentiate three distinct stages of CE development: (i) semantic articulation, (ii) structural consolidation, and (iii) emergent alignment of semantics and structures.

The provocation and novelty of our argument lie in challenging the conventional interpretation of the non-implementation of the CE's moral case as a purely negative phenomenon. Instead, we contend that this non-implementation constitutes an integral component of the systemic evolution of the CE, underscoring its role in fostering innovation and enabling innovative governance. Far from being a weakness to be eradicated, the persistent gap between the CE's normative ideals and practical realities (e.g., Corvellec et al., 2022) serves as a productive force. This gap reinforces the moral case for CE, functioning as a source of flexibility and innovation that allows the CE to adapt to dynamic economic, environmental, and societal contexts. Through the generation of systemic critique, learning, adaptation, and refinement, non-implementation becomes a mechanism through

which the CE evolves in response to emerging conceptual/theoretical and empirical challenges as mentioned by, for example, Corvellec et al. (2022), Kirchherr et al. (2023a), and Mignacca et al. (2025).

We accordingly advocate for a vision of the CE not as a static framework but as a heuristic—a conceptual tool for navigating the inherent complexities of sustainable development, emphasizing the indispensable role of iterative feedback and adaptive governance in driving circular transitions. Our argument has particular relevance to ongoing debates concerning the role of public policy in advancing the CE. While policy interventions are frequently regarded as essential for scaling circular practices (Hartley et al., 2020; Milios, 2021), their potential remains a matter of contention (cf. Corvellec et al., 2022), particularly when CE initiatives prioritize a narrow focus on economic efficiency, thereby emphasizing the business case at the expense of the broader moral case (cf. Valenzuela & Böhm, 2017). We contribute to these debates by offering a critical insight: non-implementation—often dismissed as failure—may, in fact, play a functional role in the CE's development. Gaps in implementation generate feedback loops that can stimulate systemic innovation, foster stakeholder engagement, and influence policy design and development.

2 | THEORETICAL FRAMEWORK: A LUHMANNIAN PERSPECTIVE ON THE DEBATE

2.1 | Luhmann's social systems theory and the circular economy

Niklas Luhmann, an eminent German sociologist, drew extensively on contemporaneous developments in systems-theoretical scholarship to articulate a grand sociological theory that constitutes a distinct alternative to Parsons' vision of structural functionalism. Whereas Parsons posited that the preservation of social structure requires a set of predetermined systemic functions, Luhmann identified the basic function of social systems as the reduction of complexity, enabling human beings to maintain orientation in an exceedingly complex world despite their cognitive limitations (Luhmann, 2012, 2013). This complexity-reducing function is characteristic of all the function systems into which modern society is differentiated—such as the economy, law, politics, and science—each of which operates according to its own systemic logic (e.g., Roth, 2025; Valentinov et al., 2021).

Luhmann (1989) explicitly linked the complexity-reducing function of social systems, especially function systems, with the ecological crisis of modern society, prompting some scholars to articulate the notion of a "complexity–sustainability trade-off" in his conception of system–environment relations (Valentinov, 2014). This trade-off reflects the paradox that, while function systems reduce complexity to ensure operational stability, such simplification may come at the expense of long-term sustainability, particularly within the economic system, which tends to remain insensitive to ecological boundaries. Overcoming this trade-off, especially in the context of the economic function system, has been identified by Neisig (2022) as a Luhmannian rationale for the CE, which potentially involves a shift from complexity-reducing to sustainability-enhancing feedback mechanisms, thereby rendering the economic function system more responsive to its ecological environment (cf. Neisig, 2022; Valentinov, 2017). In discussing the evolutionary nature of CE development, Neisig (2022) emphasizes the co-evolution of semantics and structure—two core concepts in Luhmann's account of the evolution of modern society. In the CE context, semantics encapsulate concerns about unsustainability as well as visions of ecological regeneration, while structures represent the extent to which these semantic categories become institutionalized within function systems, particularly in the economy.

As Neisig (2022, p. 1909) acknowledged, CE semantics often carry moral connotations and thus become the object of moral communication, whereas structural change toward CE remains slow. This inertia is rooted in the complexity-reducing nature of social systems, both function systems and organizations, which inhibits direct coordination among them. These coordination challenges have also been highlighted by other scholars examining CE through a Luhmannian lens (Gonser & Hinske, 2023; Pel & Achten, 2022). However, as Neisig explains in a subsequent work, "semantics 'irritate' businesses, prompting shifts in structures toward regenerative practices" (Neisig, 2025, p. 532). She interprets these shifts through Luhmann's (2012) generic evolutionary model, which incorporates Darwinian phases of variation, selection, and stabilization. In this model, new semantics illuminate novel evolutionary possibilities, thereby stimulating variation; only some of these possibilities are selected by social systems in accordance with their complexity-reducing function, and eventually stabilized within systemic structures and operations (Neisig, 2025). This process of stabilization is exemplified by what Neisig (2025, p. 531) calls "recalibrated market mechanisms," which we interpret as corresponding to the emergence of the business case for CE (Schultz et al., 2025a).

In her broader contribution, Neisig (2025) develops a comprehensive Luhmannian conceptual transition model for regenerative societal change, incorporating elements such as strengthened sustainability-enhancing feedback, regenerative reflexivity, rearranged structural couplings among social systems, tipping points triggering phase transitions, and the retention of regeneration within the memory of social systems. This model offers a sophisticated account of how the development of CE might ultimately overcome persistent implementation barriers, particularly those stemming from the absence of direct communication and coordination among differentiated social systems. Building on Neisig's framework, our own contribution narrows the analytical lens to focus on the role of expectations, which Luhmann (2012, 2013) regarded as the primary manifestation of systemic structures. By foregrounding expectations in this way, we seek to illuminate the productive interplay between non-implementation and systemic evolution, thus offering a novel Luhmannian perspective on the developmental dynamics of the CE.

2.2 | Expectations in Luhmann's social systems theory: A brief recap

Luhmann (2012, 2013) argued that the complexity-reducing function of social systems is fulfilled by a variety of systemic structures that manifest as expectations. These expectations function to suppress possibilities, narrowing the range of potential actions within a social system relative to the broader and more indeterminate possibilities of its surrounding environment (Luhmann, 2012, 2013). In this way, expectations serve as the fundamental mechanisms by which systems reduce uncertainty, stabilize interactions, and maintain their boundaries in relation to their environments (Luhmann, 2012, 2013).

Luhmann distinguishes between two types of expectations—cognitive expectations and normative expectations—each with distinct roles in the operation of social systems (Luhmann, 2012, 2013). As Baraldi (2021) elucidates, the difference between these two forms of expectations lies in how systems react to their disappointment. Cognitive expectations are contingent and open to revision; when they are contradicted by reality, they are adjusted to better align with the new information. These expectations are central to systems that prioritize learning and adaptation, such as science and the economy. Future-oriented in nature, cognitive expectations guide systems as they seek solutions to novel problems or unexpected contingencies. Normative expectations, by contrast, are prescriptive and retain their validity even when violated (Luhmann, 2012, 2013). When such violations occur, they do not lead to the revision of normative expectations but instead trigger sanctions or mechanisms that reinforce their continued relevance (ibid). For example, the legal system responds to norm violations with penalties, while social norms are upheld through mechanisms such as shame or exclusion. Luhmann underscores that this persistence of normative expectations is crucial for maintaining the stability of systems that rely on predictable behavior (cf. Luhmann, 2020). Normative expectations, therefore, define what ought to happen in social interactions and are indispensable for systems that depend on continuity, such as law, politics, or religion, where adherence to established rules and values is paramount.

While Luhmann draws a clear conceptual distinction between cognitive and normative expectations, he emphasizes their functional interdependence in modern society (Luhmann, 2012, 2013). In many systems, these two types of expectations operate in tandem, harmonizing the need for stability with the need for adaptability. For instance, within the legal system, normative expectations, such as adherence to established legal norms, provide structural stability, ensuring that the system remains cohesive even when challenged. At the same time, cognitive expectations, such as the interpretation of ambiguous statutes or the anticipation of legal outcomes, allow the same system to adapt to novel cases and evolving societal conditions (Baraldi, 2021).

2.3 | Rethinking business case and moral case for circular economy

We argue that Luhmann's concepts of cognitive and normative expectations offer novel insights into the concepts of business case and moral case as historically employed in the corporate social responsibility, corporate sustainability, and business ethics literature, with considerable implications for the CE scholarship. These two concepts have emerged as key motivations for firms' engagement in sustainability initiatives (e.g., Kaplan, 2020; Rasche et al., 2023). The business case, rooted in economic pragmatism, posits that sustainable practices are justified when they yield tangible economic benefits for companies (e.g., Carroll & Shabana, 2010; Salzmann et al., 2005; Schaltegger & Burritt, 2018; Schaltegger et al., 2012, 2019). By contrast, the moral case asserts that firms have an intrinsic ethical responsibility to adopt sustainable practices irrespective of profitability (e.g., Hahn et al., 2010, 2014; Rasche et al., 2023). The tension between these cases, often marked by trade-offs and conceptual discord, has been widely discussed (see, e.g., Crane et al., 2019; Porter & Kramer, 2011; Schultz et al., 2025a), also in the context of the CE literature, where aligning economic and environmental objectives often proves elusive (e.g., Daddi et al., 2019; Dzhengiz et al., 2023; van Loon et al., 2018).

The moral case for the CE encompasses the ethical principles of sustainable development, intergenerational justice, and shared responsibility (e.g., Palm et al., 2024; Valencia et al., 2023). In contrast to the current linear economic model of "take-make-use-dispose," which depends on the extraction of finite resources and accelerates the depletion of non-renewable materials, the moral case envisions economic systems operating within ecological boundaries. It emphasizes regeneration over exploitation and collective responsibility over short-term gain (Kirchherr et al., 2023a). This vision translates into CE's advocacy for resource-efficient strategies aimed at decoupling economic growth from environmental degradation (cf. Kirchherr, 2022; Kjaer et al., 2019; Schultz et al., 2024a). Businesses, governments, and individuals are thus called to reduce resource depletion, minimize waste, mitigate climate impacts, and uphold intergenerational equity (Mies & Gold, 2021; Valencia et al., 2023).

From the perspective of Luhmann's systems theory, this moral case for CE can be understood as a normative expectation, retaining its validity even when not fully implemented. In contrast, the business case operates as a cognitive expectation, supporting circularity only when sustainable practices align with financial goals, such as cost savings from energy efficiency or enhanced consumer loyalty to eco-conscious brands. However, the business case often falters when circular practices entail high upfront costs, uncertain returns, and other barriers (e.g., Geissdoerfer et al., 2023; Guldmann & Huulgaard, 2020). The divergence between the moral and business cases—manifesting as the non-implementation of the moral case—performs vital functions by acting as an irritation that prompts companies and policymakers to adapt. We identify three key functional effects of this non-implementation. First, it highlights structural barriers to circularity by exposing gaps between normative expectations and practical

realities, thereby fostering targeted interventions to address these root causes. Second, it enables gradual adaptation, preventing the overburdening of systems that lack the capacity for immediate and comprehensive change. Finally, non-implementation stimulates systemic change, such as when societal critique of unsustainable practices—for example, consumer campaigns against fast fashion—exerts pressures on businesses and policymakers to adopt circular strategies.

3 | EVOLUTIONARY STAGES OF THE CIRCULAR ECONOMY IN THE EU

The non-implementation of the moral case for the CE has given rise to dynamic interactions between normative expectations and the practical challenges of implementation. Violations of circular principles have functioned as systemic irritants, catalyzing innovation, critique, and reform. These interactions illustrate that the CE transition in the EU is not a linear progression but rather an evolutionary development, shaped by societal, institutional, and technological dynamics. Focusing on the functional role of this non-implementation, we identify three analytically distinct but overlapping stages in the evolution of CE: (i) semantic articulation, (ii) structural consolidation, and (iii) emergent alignment of semantics and structures. Each of these stages is examined in detail in the following subsections, drawing on Luhmann's theory of societal evolution to illuminate the evolving relationship between CE-related semantics and institutional structures.

3.1 | Stage 1: Semantic articulation

The foundational stage of the CE in the EU was marked by the gradual emergence of sustainability-related semantics and growing recognition of the environmental and economic limitations of the linear economy across scientific, political, and public discourses. During this period, circularity was articulated primarily as a moral imperative, rooted in normative principles of waste prevention, resource conservation, and environmental protection. These ethical commitments laid the semantic groundwork for CE, expressed in a discourse that emphasized ecological responsibility and intergenerational equity. They were reinforced by a series of early policy instruments aimed at addressing systemic inefficiencies and mitigating environmental harm.

Key policy measures—such as the Thematic Strategy on Waste Prevention and Recycling (COM2005 666), the Landfill Directive (1999/31/EC), and the Packaging and Packaging Waste Directive (94/62/EC)—reflected these initial normative ambitions to shift away from the linear economic model. However, implementation lagged significantly behind these aspirations. Recycling infrastructure across many EU member states remained underdeveloped, with municipal recycling rates stagnating at around 30% in 2004 (EEA, 2024), while landfilling continued to dominate in several regions (Eurostat, 2025). Businesses and consumers had few incentives to adopt circular practices, due to a lack of regulatory and financial mechanisms. Public awareness of CE's potential benefits was similarly limited, further impeding progress.

From a Luhmannian perspective, CE communication in this phase can be understood as normatively generalized but cognitively unanchored: the semantics of CE circulated symbolically within political and societal discourse but lacked integration into functionally differentiated systems, particularly the economy. Nevertheless, this non-implementation had a productive function. The failure to meet normative expectations revealed deep-seated structural deficiencies, including infrastructural limitations and insufficient public engagement, which in turn stimulated institutional learning. These early failures helped justify later reforms, such as the Waste Framework Directive (2008), which introduced life-cycle thinking and strategic planning across EU policy frameworks.

Crucially, the visible disjunction between semantic ambition and empirical reality served to heighten public sensitivity to the environmental costs of linearity. Media coverage of landfill overflows and plastic pollution contributed to a nascent cultural shift, laying the groundwork for broader societal critique and later regulatory momentum. Thus, despite limited practical progress, the semantic articulation of CE during this stage played a formative role: it stabilized normative commitments, generated societal irritations, and triggered the initial adaptive responses of various function systems.

3.2 | Stage 2: Structural consolidation

The second stage of the CE in the EU marked a decisive shift from semantic generalization to the institutional codification of circular principles through enforceable policies and measurable targets. Yet, despite this formalization, implementation remained constrained by structural inertia. Key policy initiatives—such as the Circular Economy Action Plan (COM2015 614), the Revised Waste Framework Directive (2018/851), the Single-Use Plastics Directive (2019/904), and the Eco-Design Directive (2009/125/EC)—served to embed CE goals into EU governance structures. These measures reflected the Union's growing commitment to operationalizing CE not merely as a normative aspiration but as a practical framework for

sustainability governance. By setting enforceable targets and introducing concrete regulatory mechanisms, this phase moved beyond aspirational declarations and sought to construct the institutional foundations for systemic change.

Nevertheless, outcomes remained modest. Recycling rates improved only incrementally and remained uneven, averaging below 50% by 2020 (EEA, 2024). Consumer behaviors often resisted circular practices such as reuse and repair (Kirchherr et al., 2018), while businesses confronted substantial transition costs and market uncertainties (e.g., Schultz & Reinhardt, 2022). These obstacles underscored the inertia of entrenched operational routines and revealed the limitations of top-down regulatory efforts in achieving deep structural transformation.

From a systems-theoretic perspective, these implementation gaps stemmed from the difficulties of mutual coordination among distinct function systems. Normative expectations were now codified in law and policy, but corresponding transformations in other subsystems—particularly the economy—lagged behind. The legal system formalized semantic content, while the economic system continued to operate on cognitive expectations tied to profitability and risk minimization. This disjunction produced the inertial forces that impeded full realization of CE objectives.

However, as Luhmann's theory suggests, such gaps between semantic codification and structural transformation can serve as productive irritants. Failures to meet circularity targets revealed infrastructural and behavioral deficiencies that, in turn, stimulated targeted adaptive responses. The proliferation of plastic waste, for instance, spurred the Single-Use Plastics Directive, while challenges in meeting eco-design standards prompted phased transitions that allowed industries time to innovate. Companies such as IKEA began to integrate repairability and recyclability into product design, illustrating how semantic pressure can gradually reshape structural practices (IKEA, 2024).

These dynamics exemplify how non-implementation operates diagnostically: it exposes the misalignment between formalized normative commitments and systemic operational logic, thereby generating pressures for incremental adjustment. Technological responses, such as chemical recycling (Schultz & Reinhardt, 2023), emerged in precisely this space of friction. Thus, the consolidation of circular semantics into legal and policy structures did not immediately ensure behavioral convergence, but it created the conditions for gradual realignment across differentiated societal systems.

3.3 | Stage 3: Emergent alignment of semantics and structures

The third stage of CE development in the EU is marked by the gradual emergence of feedback loops between CE semantics and institutional structures, suggesting the incipient alignment of normative expectations with the operational logics of functionally differentiated systems. Building on the symbolic articulation of circularity and its subsequent policy institutionalization, this phase has been shaped by the integration of CE principles into strategic, cross-sectoral frameworks, most notably the European Green Deal (2019) and the Revised Circular Economy Action Plan (2020). These initiatives elevated CE to a central role in Europe's broader sustainability strategy, coupling circularity with objectives related to climate resilience, resource security, and economic transformation.

This stage reflects a shift from isolated, sector-specific interventions to systemic integration strategies. Structural mechanisms within various function systems now increasingly reflect normative aspirations articulated in earlier stages. This is evident in innovations such as digital tools for waste tracking, expanded extended producer responsibility (EPR) schemes, and sectoral circularity mandates in textiles, construction, and electronics. Although implementation continues to be uneven, these developments indicate that semantic commitments to circularity are now beginning to reverberate within policy instruments, market logics, and organizational design. For instance, e-waste recycling remains limited, and small and medium-sized enterprises (SMEs) continue to face disproportionate burdens, while consumer resistance to repair and reuse persists (Kirchherr et al., 2018; Sundar et al., 2023). Similarly, technological constraints, such as the challenge of recycling composite materials or hazardous waste (Paletta et al., 2019), still inhibit the operationalization of CE goals. Nevertheless, the appearance of new organizational forms, regulatory standards, and economic models grounded in CE semantics indicates a transition toward semantic–structural co-evolution, as also noted by Neisig (2022, 2025).

From a Luhmannian perspective, this co-evolution signals a partial resolution of the prior disjunction between normative and cognitive expectations within the functionally differentiated setting. Function systems such as law, politics, and the economy now selectively absorb and codify circularity semantics according to their internal codes. The law translates normative CE claims into justiciable standards, such as those embedded in the Right to Repair framework. Economic actors respond by incorporating design for longevity, repairability, and material reuse into business models (cf. Pies & Schultz, 2023), revealing that semantic expectations are beginning to shape cognitive operational programs.

Crucially, non-implementation remains a key irritant in this stage, but it now operates within a more reflexive feedback architecture. First, implementation gaps continue to reveal systemic inefficiencies, prompting focused regulatory responses. The persistence of e-waste, for example, has reinforced the legal prioritization of durability and repair rights, directly aligning legal codification with earlier semantic critiques. Second, market innovation is increasingly semantically driven. Barriers to traditional recycling have accelerated the diffusion of leasing models and product-as-a-service systems (Kjaer et al., 2019), while secondary materials markets continue to grow, aiming to reduce dependence on virgin resources (Geissdoerfer et al., 2023). Third, societal critique remains vital in reinforcing CE semantics through public pressure. High-profile failures—such as persistent plastic waste pollution—have spurred civic advocacy campaigns, notably the European Environmental Bureau's "Right to Repair" initiative (EEB, 2025), which transforms normative discontent into structural reform momentum.

TABLE 1 Overview of the three stages of the CE evolution in the EU.

Stage	Characteristics	Key developments	Examples of non-implementation	Functional role of non-implementation
1. Semantic articulation	- Normative ideals without structural anchoring. - Foundational stage for CE principles. - Circularity framed as a moral imperative tied to sustainability. - Early policies focus on waste prevention and resource efficiency. - Emerging in the late 1990s and gaining prominence through the 2000s.	- **Thematic Strategy on Waste Prevention and Recycling (2005)**: Established waste hierarchy. - **Landfill Directive (1999)**: Set targets for reducing biodegradable waste. - **Packaging and Packaging Waste Directive (1994)**: Addressed recycling and reuse in packaging.	- Low recycling rates across the EU. - Continued reliance on landfills exceeding 50% in many member states. - Minimal incentives for businesses to adopt circular practices.	- Highlighted systemic barriers such as inadequate waste infrastructure. - Stimulated policy reform, leading to stronger directives like the Waste Framework Directive (2008). - Raised public awareness about the environmental impact of the linear economy.
2. Structural consolidation	-Formal codification of CE semantics - CE becomes a formalized policy objective. - Binding targets and measurable goals introduced. -Institutionalization through EU-wide governance mechanisms - Developing primarily from the mid-2010s onward	- **Circular Economy Action Plan (2015)**: Established CE as a central EU goal. - **Revised Waste Framework Directive (2018)**: Increased recycling targets and mandated bio-waste collection. - **Single-Use Plastics Directive (2019)**: Addressed plastic pollution and recycling.	- Recycling rates plateaued in some countries, with lagging states like Romania and Greece. - Continued reliance on incineration and landfill in certain regions. - Consumer behaviors still favor disposable products.	-Revealed disjunctions between policy design and subsystem behavior. -Triggered targeted reforms (e.g., phased standards and eco-design). -Encouraged innovation through systemic irritation and compliance adaptation.
3. Emergent alignment of semantics and structures	- Feedback loops between CE semantics and systemic structures. - CE becomes integrated into broader sustainability strategy. - Sectoral alignment in law, markets, and technology begins. - Emphasis on adaptive governance and structural reflexivity. - Become visible in the early 2020s.	- **European Green Deal (2019)**: Positioned CE as a pillar of sustainability. - **Revised Circular Economy Action Plan (2020)**: Focused on sectors like textiles, construction, and electronics. - **Right to Repair Framework**: Introduced repairability standards for electronics.	- Low formal recycling rates for e-waste. - Persistent consumer resistance to repair and reuse. - SMEs face high costs and logistical barriers to adopting circular practices.	- Reinforced CE norms through legal codification and civic advocacy. - Catalyzed market innovation (e.g., leasing and product-as-a-service). - Signaled recursive coupling of semantics and structures across systems.

While full alignment remains aspirational, what emerges in this stage is a pattern of recursive coupling between CE-related semantics and differentiated social structures (cf. de Ridder et al., 2023). Systems continue to interpret and implement circularity in divergent ways, but they increasingly stabilize selected semantic expectations within their operational logics. Law, politics, and economy no longer merely receive circularity discourse—they institutionalize, adapt, and iterate it. What was once a generalized normative call becomes a structured site of governance innovation and market restructuring.

Thus, this stage reflects the emergent alignment of semantics and structures: a dynamic interplay where non-implementation acts not as an obstacle, but as an integral part of evolutionary learning. Through targeted adaptation, semantic stabilization, and systemic reflexivity, the CE continues to evolve not as a fully harmonized program, but as an increasingly embedded set of expectations and operational routines across the functional architecture of the EU. In this way, circular principles are no longer external moral pressures, they become internalized references that guide the selective stabilization of both policies and practices across Europe's economic and environmental landscape.

Table 1 summarizes the three stages of CE evolution in the EU.

4 | DISCUSSION AND IMPLICATIONS

The functional role of non-implementation in the CE offers a profound rethinking of how scholarship, policymakers, and managers might approach the persistent gap between normative aspirations and practical realities. Most importantly, the transition to a CE demands flexibility from scholars, policymakers, and managers, allowing dynamically developing adaptive frameworks to replace static directives to evolve in response to emerging feedback. Drawing on Luhmann's systems theory, our analysis emphasizes that non-implementation is not merely a transitional failure to be rectified but a recurring and structurally embedded feature of modern, functionally differentiated societies. In this context, normative expectations—such as the moral case for the CE—retain their validity even when violated, and such violations operate as systemic irritants, catalyzing processes of learning, critique, and adaptation across social subsystems. This perspective builds upon, and extends, the important work of Neisig (2022, 2025), who conceptualizes the CE as a process of co-evolution between semantics and structures. We argue that this relationship is mediated by expectation dynamics, which place non-implementation at the very center of CE evolution. By zooming in on the Luhmannian distinction between cognitive and normative expectations, we are able to trace the evolutionary trajectory of the CE as one in which violations of normative expectations stimulate the emergence—and eventual stabilization—of revised cognitive expectations, for instance through "recalibrated market mechanisms" (Neisig, 2025, p. 531). On this basis, we enrich Neisig's (2022) evolutionary model by emphasizing the functional effects of discrepancies between semantics and structure, effects that operate as diagnostic tools and innovation stimuli, generating differentiated learning trajectories across the economy, politics, and civil society.

For scholarship, our study offers three key contributions to the CE debate. First, it reframes the non-implementation of CE principles not as a failure but as a functional process that drives systemic learning, adaptation, and innovation. By positioning non-implementation as a catalyst for change, this perspective challenges dominant narratives in sustainability transitions (cf. Leipold et al., 2023) and invites future research on the productive role of institutional gaps and policy inefficiencies. Second, by integrating Luhmann's social systems theory, this study introduces a novel lens to CE scholarship, distinguishing between cognitive (business case) and normative (moral case) expectations. This theoretical contribution provides a foundation for further inquiry into how organizations navigate tensions between economic imperatives and ethical obligations (cf. Daddi et al., 2019). Third, this study elaborates on the persistent misalignment between the business case for CE, which emphasizes profitability and operational efficiency, and the moral case, which is rooted in broader ethical responsibilities (cf. Kirchherr, 2022; Schultz et al., 2024a; Siderius & Zink, 2023). Addressing this persistent divide is critical, as it underscores the challenges of embedding normative aspirations within market-driven systems. Thus, future research should explore mechanisms for integrating moral considerations into CE strategies without compromising economic viability.

The Luhmannian perspective diverges in important ways from more conventional explanations of non-implementation. For instance, organizational learning approaches typically interpret implementation gaps as temporary capability deficits: organizations may endorse sustainability goals but lack the knowledge, resources, or competencies to implement them effectively (e.g., Subramanian & Suresh, 2022). Similarly, institutionalist perspectives often emphasize competing institutional logics, suggesting that actors strategically navigate tensions—such as those between profit and legitimacy—to advance particular objectives over time (e.g., Dagilienė et al., 2024). While both perspectives yield valuable insights, they generally presume that non-implementation is a problem to be overcome, a transitory deviation on the path toward goal fulfillment. Complementary to these approaches, our proposed Luhmannian framework reconceptualizes non-implementation as a persistent and productive force. It does not arise from deficits in knowledge or agency, but from the way autonomous, functionally differentiated social subsystems operate according to distinct, self-referential logics.

For example, while legal and political systems may codify the normative expectations of circularity, the economic system continues to respond predominantly to cognitive expectations tied to profitability, cost-efficiency, or innovation potential. From this vantage point, the task is not to eliminate non-implementation, but to understand how it may function as a generative mechanism that facilitates systemic feedback, structural reflection, and co-evolution across subsystems. Rather than prescribing one-size-fits-all solutions, this view calls for reflexive and adaptive governance capable of operating across differentiated systemic logics, inviting future research on how expectations are stabilized or contested within and across subsystems, and how irritations generated by non-compliance are translated into functional innovation, policy reform, or institutional adaptation.

For policymakers, this article proposes to design adaptive regulations as iterative platforms for experimentation and refinement. For example, the Circular Economy Action Plan could incorporate phased milestones, encouraging member states and industries to pilot circular practices, identify challenges, and co-develop tailored solutions. Similarly, managers must adopt iterative approaches to CE implementation, treating sustainability as an evolving process rather than a fixed goal. Phased adoption of circular practices, such as piloting modular product designs or circular supply chains, allows companies to adapt incrementally while mitigating risks.

Second, both policymakers and managers can use instances of non-implementation as diagnostic tools for uncovering structural barriers—whether technological, regulatory, or cultural—that hinder the transition to circularity. For policymakers, this means transforming non-implementation data into actionable insights. For instance, EU member states with high landfill rates, such as Romania or Bulgaria, could receive targeted funding and technical assistance to develop advanced recycling infrastructure. Similarly, underperforming industries, such as electronics and e-waste management, could benefit from innovation grants to scale emerging technologies like chemical recycling. At the managerial level,

organizations can implement circularity audits to evaluate where their operations fall short of CE principles. These audits should identify bottlenecks, such as misaligned incentives across value chains or insufficient supplier engagement, and inform targeted interventions to resolve them. In doing so, managers can create a feedback loop that not only improves performance but also strengthens alignment with broader policy objectives.

Third, the functional effects of the non-implementation of the moral case for CE make transparency essential for fostering stakeholder trust (cf. Schultz et al., 2024c) and sustaining momentum for the circular transition. Policymakers and managers alike must communicate both successes and challenges openly, reframing non-implementation as a natural and necessary part of systemic evolution. Policymakers could create tools such as an EU Circular Economy Dashboard to provide real-time updates on progress, gaps, and corrective measures. This dashboard would not only showcase advancements in waste reduction or recycling rates but also highlight ongoing challenges, such as delays in infrastructure development. By acknowledging these hurdles, policymakers can demonstrate accountability and reinforce public confidence in the circular transition. For managers, transparency involves engaging stakeholders—employees, customers, and investors—in the organization's circular journey. Circularity dashboards within companies could track metrics such as resource efficiency, waste reduction, and adoption of circular business models. Beyond celebrating successes, these dashboards should also address areas where progress is lagging, fostering a collaborative approach to overcoming obstacles.

Fourth, and related, the non-implementation of the moral case for CE reinforces the need for cross-sectoral collaboration among CE stakeholders (cf. Jaeger-Erben et al., 2025). Policymakers can foster collaboration through public–private partnerships and industry consortia focused on scaling circular solutions. For instance, joint initiatives to develop advanced recycling technologies or shared platforms for material tracking can address systemic barriers that individual entities cannot overcome alone. Similarly, managers should actively seek collaborative opportunities within their industries and beyond. Partnering with suppliers, competitors, and research institutions can accelerate the development and deployment of circular practices. Collaboration not only shares the burden of systemic change but also enhances collective learning, enabling more effective and scalable solutions.

By foregrounding the structural dynamics of non-implementation, the Luhmannian approach we propose moves beyond the treatment of implementation gaps as anomalies, interpreting them instead as constitutive elements of systemic transformation—forces that, when engaged with productively, can drive the CE forward in ways that are context sensitive, adaptively governed, and socially embedded.

While our systems-theoretic lens emphasizes the productive potential of non-implementation, it is essential to acknowledge its limitations and risks. Not all instances of non-compliance result in positive systemic adaptation. In politically sensitive or economically marginalized contexts—such as the continued reliance on landfilling in parts of Eastern Europe—non-implementation may entrench structural inertia, undermine the credibility of normative commitments, and contribute to public disillusionment. In such cases, violations of normative expectations may not function as productive irritants but instead reinforce existing dysfunctions or trigger disengagement. These risks highlight the need for careful contextual analysis and underscore the importance of participatory governance mechanisms that can translate normative commitments into locally resonant, socially legitimate strategies for circular transition (e.g., Jaeger-Erben et al., 2025; Schultz, 2021; Schultz et al., 2021, 2024b). In this regard, responsive and inclusive governance is not only a complement to system differentiation—it is a precondition for ensuring that non-implementation serves as a catalyst for transformation rather than a vector of stagnation.

5 | CONCLUSION

The CE in the EU, while grounded in the compelling moral case for harmonizing economic growth with ecological aspirations, continues to face significant implementation challenges that leave this moral case unrealized. Yet, as we argue in this forum article, the non-implementation of the moral case for circularity is not merely a failure but a catalyst for systemic evolution. Through the lens of Luhmann's systems theory, the moral case operates as a normative expectation—an enduring societal "ought" that retains its validity even when it is not fully realized in practice. The Luhmannian perspective makes clear that violations of this expectation, rather than undermining its legitimacy, reinforce its necessity and influence the trajectory of the EU's transition toward sustainability. Thus, paradoxically, it is within the gaps between aspiration and reality that the moral case exerts its greatest force. These gaps act as irritations, challenging entrenched practices, exposing systemic barriers, and generating the creative tension essential for innovation and reform.

Further, they drive the evolutionary trajectory of the European CE, which we characterize through distinct stages: emergence, institutionalization, and acceleration. These stages underscore that the path to circularity is not linear but iterative, shaped by feedback loops in which failures and non-compliance serve as critical learning opportunities. Like a compass, the moral case for the CE provides direction even as the terrain beneath our feet shifts. Ultimately, the CE's greatest lesson may be this: *progress is not defined by the absence of failure but by the capacity to transform failure into momentum*. In the tension between what is and what ought to be, the moral case for circularity endures, fueling the evolution of a system that, much like nature itself, thrives not in perfection but in adaptation.

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