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ORIGINAL PAPER

The difficulties in finding value in waste: linking institutional dynamics and circular business model development

Cornelia Huis[1] · **Christine Vallaster**[1] · **Julian M. Müller**[2]

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Abstract

This paper explores how institutional forces, such as regulations, industry standards, and market expectations, interact and shape circular business models. It examines the dynamic interplay of coercive, normative and mimetic pressures and their influence on circular business models, i.e., value that is created, offered, and captured. To do so, we analyze both the organizational field (including actor roles, perceptions of waste, collaboration, circular activities, and strategies) and the material field (such as material availability, data flows, and product norm development). Following a qualitative research approach over a time span of one year in the construction industry in Austria, we identify three distinct pathways through which institutional pressures influence circular value creation, offer, and capture. Each pathway varies in its ability to steer institutional field development for circular business models, shaping organizational and material fields. Our findings provide insights for managers and policymakers on how to foster circular business models, ultimately enhancing waste valorization in the construction sector.

Keywords Waste valorization · Circular economy · Business model · Institutional theory · Construction industry · Qualitative research

JEL Classification M10

✉ Cornelia Huis
cornelia.huis@plus.ac.at

Christine Vallaster
christine.vallaster@plus.ac.at

Julian M. Müller
julian.mueller@fau.de

[1] Paris Lodron University of Salzburg, Salzburg, Austria

[2] Friedrich-Alexander-University Erlangen-Nürnberg (Germany), Erlangen, Germany

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1 Introduction

Waste valorization refers to the extraction of value from discarded materials through recycling, reuse, and recovery. This approach signifies a fundamental shift toward a circular economy, in which resources are not consumed and discarded but continually cycled. From a business model perspective, waste valorization is not merely a technical or operational challenge but a strategic opportunity to reconfigure value creation, delivery, and capture. Drawing on Mulvaney et al. (2021) and Nayak and Bhushan (2019), it becomes evident that while the physical availability of secondary raw materials is a prerequisite, the successful integration of waste valorization into business models hinges on firms' internal capacities, such as technical expertise, robust data infrastructures, and adaptive processes. Moreover, it requires positioning within a circular organizational field through active stakeholder engagement with regulators, suppliers, and customers (Nodehi and Taghvaee 2022; Oberholzer and Sachs 2023), thereby embedding circularity into circular business models (CBMs). CBMs can be subsumed by three dimensions: (1) Value proposition: A credible promise that a product or service delivers utility and retains material value (Mulvaney et al. 2021; Nodehi and Taghvaee 2022); (2) Value creation: The activities, technologies, and partnerships that transform residuals into marketable outputs and bring them to customers (Nayak and Bhushan 2019; Oberholzer and Sachs 2023); (3) Value capture: The mechanisms through which economic and sustainability returns are appropriated, e.g., cost savings, green-premium pricing, or compliance credits (Parida et al. 2019; Simpson 2012). Existing research emphasizes that successful CBMs rely not only on access to secondary raw materials but also on firm-level capabilities such as technical expertise, digital traceability, and adaptive routines (Mulvaney et al. 2021; Nayak and Bhushan 2019). Moreover, companies must navigate complex institutional environments filled with/including regulations, industry norms, and stakeholder expectations (Lebelhuber and Greiling 2022), shaping what counts as valuable, feasible, or legitimate in circular transitions (Nodehi and Taghvaee 2022; Oberholzer and Sachs 2023). Thus, CBMs are embedded in and shaped by broader institutional dynamics. To better understand these dynamics, we build on institutional theory, particularly the concept of the organizational field as introduced by DiMaggio and Powell (1983), which highlights how actors adapt to coercive (e.g., compliance with EU regulations), normative (e.g., aligning with industry expectations for circular business practices), and mimetic pressures (e.g., imitating a competitor's successful refurbished equipment).

However, institutional theory has often paid limited attention to technologies and materiality as analytical categories (de Vaujany et al. 2019; Svensson and Gluch 2022). Especially in material-intensive sectors such as construction, where physical infrastructures and spatial embeddedness are fundamental, organizational changes cannot be fully understood without considering the interaction between institutional logics and material conditions. In response, we propose a dual-field framework that analytically distinguishes between two interdependent domains: The circular organizational field refers to the relational space in which actors (firms, regulators, civil society) negotiate meanings, establish norms, and mobilize resources for circular practices. The circular material field, by contrast, encompasses the physical stocks

of secondary materials, the recovery and processing technologies that enable valorization, and the standards and infrastructures that govern material circulation. While the fields are conceptually distinct, we emphasize their co-evolution, as institutional pressures shape material flows, and material constraints and influence what becomes institutionalized.

To explore how firms operate at the intersection of these fields, we turn to business model theory as a bridging concept. Business models are increasingly conceptualized as representations of value as they serve as structuring devices that connect strategy with technology, regulation, and materiality (Geissdoerfer et al. 2018; Teece 2010; Wells 2013). In this view, CBMs translate institutional demands and market signals into concrete organizational and technological arrangements that enable circularity (Da Silva et al. 2025). This underscores the need for integrated field-level analyses to bridge CBM practices with institutional contexts and addresses the following research question:

> *How does the interplay of coercive, mimetic, and normative pressures within material and organizational fields unfold to shape the processes of value creation, value proposition, and value capture in circular business models?*

In doing so, we contribute to extant literature in three ways:

First, we advance the integration of institutional theory with circular business model research by illuminating how fragmented understandings of circularity, particularly the definition of waste versus resource—hindering progress in circular material and organizational field development. Our findings reveal that the absence of a shared vocabulary among institutional actors creates barriers for the alignment across value chains. Diverging positions between progressive front-runners and more cautious incumbents lead to tensions, while lobbying activities are often used to influence the regulatory environment.

Second, we extend institutional theory by unpacking how coercive, normative, and mimetic pressures are not merely adopted passively but are actively negotiated by organizations as suggested by Arranz et al. (2022), Calzolari et al. (2023, 2025), Kauppi and Luzzini (2022). Through iterative interactions among stakeholders, institutional pressures evolve and reshape both organizational practices and the material field (Bocken and Shirahada 2025; Borrero and Yousafzai 2024; Ingstrup et al. 2021; Lawrence and Suddaby 2006). Our study shows how firms respond strategically to policy uncertainty, technical constraints, and shifting market signals, leveraging institutional work, advocacy, and lobbying (Lawrence and Suddaby 2006; Scott 1995), highlighting the dynamic and contested nature of institutional influence in circular transitions.

Third, we contribute to the empirical depth of circular business models in the fragmented construction sector (e.g. Hartwell et al. 2021; Hossain et al. 2020). The sectoral lens on ancillary building products (e.g., insulation, plaster, windows, paint, gypsum, wood), enables a better understanding of how specific product categories undergo the transition toward circularity, offering actionable knowledge for both scholars and practitioners navigating similar industry contexts.

2 Theoretical background

2.1 Circular business model development for material residuals from an institutional theory perspective

Recent literature on CBMs highlights a shift away from linear "take–make–dispose" systems toward strategies that retain value through reuse, remanufacturing, recovery, and service-based approaches. Lüdeke-Freund et al. (2019) identify four archetypes of CBMs, i.e. Circulation, Resource Recovery, Product-as-a-Service, and Sharing Platforms, which provide a useful lens for cross-sectoral comparison (Bocken and Short 2021; Geissdoerfer et al. 2017). Key enablers of CBM implementation include partnerships with reverse logistics providers, digital traceability tools (e.g., IoT, blockchain), and supportive policy frameworks that standardize material quality (González-Moreno et al. 2024; Van Capelleveen et al. 2021).

Despite growing interest and several promising pilot initiatives, the large-scale adoption of CBMs remains limited. Entrenched linear value chains, the absence of unified circularity metrics, and weak market support for secondary materials continue to constrain systemic transition (Pomponi and Moncaster 2017; Urbinati et al. 2017). Barriers also persist on the demand side, including consumer reluctance toward refurbished products, regulatory fragmentation, and misaligned incentives in extended supply chains (De Jesus and Mendonça 2018; Kalmykova et al. 2018; Kirchherr et al. 2018). While hybrid models combining service logic and resource recovery show potential, adoption still varies widely across sectors and material types (Hartwell et al. 2021; Hossain et al. 2020).

To better understand these implementation challenges, we draw on institutional theory, which posits that organizations respond to coercive, normative, and mimetic pressures in order to maintain legitimacy and survive within their socio-economic environments (DiMaggio and Powell 1983). These institutional forces, emanating from laws, industry norms, certifications, and stakeholder expectations, play a crucial role in shaping firms' strategic orientations and their ability to develop and sustain CBMs (Parida et al. 2019; Simpson 2012). In CBM development, coercive pressures such as mandatory recycling quotas, compliance penalties, or fiscal incentives compel organizations to reintegrate waste into the material field (Arranz et al. 2022; Calzolari et al. 2023, 2025). When these regulatory frameworks are absent or unclear, the viability of circular value propositions suffers. At the same time, normative pressures—emanating from professional associations, standards bodies, and civil society—drive the creation of shared sorting and quality rules (for example, single-origin separation in construction materials) that legitimize secondary resources use within the organizational field (Ahn et al. 2022; Lüdeke-Freund et al. 2019). Without such consensus, the efficient implementation of circular value chains is hindered. Finally, mimetic pressures lead firms to imitate successful competitors (e.g. recyclers and reuse pioneers) to reduce uncertainty about what constitutes viable, legitimate, and profitable circular practices, thereby reinforcing emerging norms and standards across both fields (Arranz et al. 2022; DiMaggio and Powell 1983).

The construction sector, in particular, offers a revealing context to examine how institutional dynamics affect CBM development. Despite being a highly material-

intensive industry with significant circular potential, construction remains underexplored in CBM research (Hartwell et al. 2021). Coercive pressures are unusually dense and multilayered: building codes, zoning laws, and demolition waste regulations operate across municipal, national, and supranational levels, creating overlapping and sometimes conflicting compliance regimes (Simpson 2012). These are further complicated by long asset lifetimes, which lock firms into uncertain regulatory futures based on today's design decisions (Pomponi and Moncaster 2017).

Normative pressures are equally distinctive. Given that buildings are safety-critical and capital-intensive, professional associations have established rigid material standards. While sustainability certifications are beginning to incorporate circularity criteria, market uptake remains strongly dependent on public incentives rather than voluntary demand (Kalmykova et al. 2018; Lüdeke-Freund et al. 2019). Mimetic forces, by contrast, remain weak. The uniqueness of construction projects and the fragmented nature of contractor networks limit the transferability of pilot practices and slow the diffusion of circular innovations (Hartwell et al. 2021; Hossain et al. 2020).

As a result, the main circularity challenges in construction revolve around aligning long-term regulatory signals with near-term investment decisions, coordinating a multitude of actors, and building traceability systems robust enough to handle heterogeneous, safety-critical materials (Calzolari et al. 2025; de Vaujany et al. 2019).

2.2 Monetizing value in waste: effects of institutional pressures on linear organizational and material fields

In a linear economy, residuals typically flow into disposal channels. In contrast, in a circular economy, by-products re-enter production loops as valuable inputs (Johansen et al. 2022; Kirchherr et al. 2023). To extend the institutional perspective beyond its social and normative focus, we introduce a material-extended view, which provides a conceptual foundation for the development and implementation of technologies, business models, and policy interventions aimed at enabling a circular economy for waste valorization (Velenturf et al. 2019). According to this analytical distinction, the organizational field captures the network of interdependent actors (e.g. suppliers, consumers, regulatory bodies) embedded within a shared institutional context (DiMaggio and Powell 1983; Scott and Meyer 1994).

In contrast to the institutional logic of the organizational field, the material field refers to physical infrastructures, resource flows, and material interdependencies and thus provides the physical framework or possibility space for what can occur within the organizational field. A material field becomes circular when waste is reused or recovered, opening new forms of value creation. But such value creation can be complex, as actors may operate within diverse institutional settings shaped by regional, sector-specific, or customer-related norms. As a result, they rarely form a uniform organizational field; instead, organizations at different levels are subject to overlapping and sometimes conflicting institutional logics (Busse et al. 2016). This shift facilitates the emergence of circular supply ecosystems, in which traditional industry boundaries are dissolved. Instead of sector-specific supply chains, activities increasingly cluster around shared materials—such as wood—enabling cross-

sectoral reuse in construction, furniture, and paper industries. As a result, firms are no longer defined by their position within an organizational field, but by their role within broader material cycles (Fischer and Pascucci 2017). Thus, while the material field is concerned with value creation through the transformation and movement of materials, the organizational field coordinates actors and aligns institutional expectations around material reuse (Kanda et al. 2021). Research shows that organizational interests and driving forces to move towards more circular and sustainable strategies, activities, and CBMs do not always align, and tensions can arise (Florez-Jimenez et al. 2024).

Rather than resolving this tension in favor of one side, we treat it as a productive ambiguity. In some cases, material infrastructures and properties may impose constraints or affordances that appear to operate according to a logic different from that of the organizational field, for instance when technical feasibility collides with regulatory or normative expectations. In other cases, both fields may represent complementary expressions of the same underlying institutional logic, such as "circularity," which materializes simultaneously in organizational policies and in infrastructures for material recovery. By conceptualizing organizational and material fields as analytically distinct yet mutually constitutive domains, our framework allows us to capture both differentiation and overlap, as well as the dialectical tensions that drive circular economy transitions.

Monetizing waste, therefore, depends on aligning institutional pressures, such as certifications or regulatory frameworks, to both secure legitimacy and ensure technical standards within the material field. Yet, such monetization is also limited by the physical properties of materials and infrastructures, which define what forms of reuse are technically feasible. When actors from different organizational fields draw on the same material field, they must negotiate cooperation and competition under shared institutional conditions for the monetization of waste (Kanda et al. 2021; Scott 1995).

This dynamic interplay, in which material-field characteristics shape organizational behavior, and organizational-field negotiations influence material flows, has been largely overlooked in existing research (Fehrer and Wieland 2021; Velenturf et al. 2019). Table 1 below summarizes our conceptual model, highlighting how coercive, normative, and mimetic pressures impact material and organizational fields as well as CBM dimensions (circular value creation, value proposition, and value capture).

3 Method

3.1 Data collection and sample

In Europe, the construction industry generates 35% of total waste, while only 8.6% is circular (DGNB et al. 2023). While Austria shows a significant alignment with circular economy principles compared to other European countries, there is considerable room for improvement, particularly in dismantling and recycling external building envelope components like windows, mineral wool, and EPS insulation systems. Our study provides insights into current practices in this sector.

Table 1 Summary of conceptual model

	Material field (tangible domain)	Organizational field (relational domain)	Business model implications
Coercive pressures	• Mandates recycled content thresholds and landfill bans, altering material flows and stimulating recovery infrastructure. • Establishes technical standards for secondary-material quality and traceability. • Creates legal certainty that derisks capital investment in sorting and reprocessing.	• Compels firms to comply, lobby, or form joint ventures to meet statutory targets. • Reallocates power among actors as regulators influence access to residual streams. • Accelerates formation of governance mechanisms (e.g., takeback schemes).	• Shapes the value proposition by legitimizing circular claims under clearly defined rules. • Drives early value creation investments (plants, data systems) to secure compliant raw materials. • Enables value capture when subsidies/tax relief close price gaps with virgin material, though dependency risk remains.
Normative pressures	• Introduces consensus-based grading, sorting, and testing protocols that define what qualifies as a recyclable input. • Enhances transparency of secondary material stocks via reporting and audit schemes.	• Facilitates trust and coordination through shared labels and industry guidelines. • Encourages multi-actor platforms for data exchange and collective learning. • Reduces information asymmetries across the value chain.	• Supports a credible value proposition by signaling quality and sustainability to buyers. • Streamlines value creation through harmonized processes and reduced transaction costs. • Strengthens value capture by differentiating certified products and unlocking green procurement premiums.
Mimetic pressures	• Diffuses proven recovery technologies and design for disassembly practices across material streams. • Promotes incremental upgrading of infrastructure as firms replicate frontrunner solutions.	• Spurs emulation of successful circular alliances, accelerating network formation. • Lowers perceived uncertainty for late adopters, encouraging entry into secondary material markets. • Reinforces emerging norms by validating early models.	• Enhances the persuasiveness of the value proposition as reference cases accumulate. • Accelerates value creation scaling through learned efficiencies and shared templates. • Expands value capture potential via larger market acceptance and learning curve cost reductions.

To achieve this, we chose Austria's construction sector as it offers an ideal setting for our research due to several reasons. First, Austria was among the first EU members to impose a landfill ban on recyclable construction and demolition waste (2004) and to embed mandatory recycling quotas. This is only mandatory EU-wide from 2030 on (Directive (EU) 2018/850). This early legislation, combined with voluntary certification schemes such as those promoted by the Austrian Sustainable Building Council (ÖGNI 2023) creates a dense mix of institutional pressures. Further, Austria has a strong construction sector with many small and medium sized firms in the crafts and trades, while the production of building materials is often dominated by large manufacturers. Further, it possesses many relevant current and alternative resources for construction, such as wood. Its requirements for structure and insulation have high standards which are typically resource-intensive due to strong winters. Finally, it is embedded in construction supply chains from its neighboring countries such as Germany or Italy, among others.

Given limited theoretical and empirical evidence on the dynamics of the emergence of CBMs and their relevant material and organizational fields via institutional pressures, we adopted an abductive, multiple-case research design. Each case contributes to validating or refuting findings derived from others (Eisenhardt and Graebner 2007; Yin 2009). This approach typically leads to more robust and broadly applicable theories in comparison to single case studies (Eisenhardt and Graebner 2007). Following the methodology outlined by Yin (2009), we identified relevant companies, gathered case data, and conducted respective analyses. As DiMaggio and Powell (1983) point out, the actors of an organizational field "cannot be determined a priori" (p. 148).

To identify relevant actors embedded in circular value creation, we applied a theory- and quota-driven snowball sampling strategy (Patton 2015), starting from companies initiating or coordinating take-back systems for insulation materials, since these actors constitute central nodes in emerging circular practices and circular business development. Our sampling logic was guided by theoretical considerations and deliberately targeted the full sequence of roles within a circular value chain. We included actors in "typical" positions (e.g., processors and disposal firms) to ensure coverage of the operational handovers that determine whether materials actually return, and we added "hybrid" actors whose activities span multiple functions because these cases reveal where coordination succeeds or fails. In construction, wholesalers frequently manufacture own-brand building materials like plasters or gypsum. Owing to the system logic of modern wall assemblies, they also distribute insulation products to processors: insulation layers are functionally coupled with plaster/gypsum systems and therefore move through the same commercial channels. This coupling matters for circularity, because insulation is rarely sold directly by the producers, so they often lose visibility of material flows once products leave the factory, while intermediaries (especially wholesalers) hold crucial information about where materials go and how they might be returned. This design enables us to trace, how dynamics in the material field (e.g., wall-assembly requirements, bundling of products) interact with organizational coordination to condition the emergence of circular business models. To enable field-level observation, we also included research institutions and public business development agencies in our sample.

While snowball sampling is valuable for accessing hard-to-reach or specialized actors, it carries the risk of bias due to homogeneity among respondents stemming from the initial network. To address this, we deliberately initiated multiple, independent snowballing paths from diverse entry points of the material flows (Patton 2015). We continuously monitored the diversity of the sample during the data collection process to avoid overrepresentation of any particular group or affiliation. The case selection combined theoretical sampling and snowballing in a sequential and complementary manner. Initially, we selected five organizations through theoretical sampling based on their strategic position in circular initiatives (e.g., initiators of take-back systems) and their role in the construction material value chain. These cases were identified through desk research and expert recommendations, using predefined criteria such as demonstrated involvement in circular practices (e.g., material recovery, reuse, or digital tracking systems), sectoral relevance (e.g., insulation, window components, paints), and geographical location within Austria and southern Germany. "Circularity" was assessed through a combination of indicators, including

the presence of closed-loop practices, product-service systems, engagement in secondary materials markets, or R&D in enabling technologies.

The diversity of companies operating in various sectors helped achieve the goal of inducting accurate, concise, and generalizable theories (Eisenhardt and Graebner 2007). We carried out 17 semi-structured, in-depth interviews and two group discussions and participated in one workshop (see Table 3 in the appendix for detailed information regarding the participants).

The sample consisted of 19 organizations representing a broad range of stakeholders relevant to closing loop practices in the construction sector. It included four manufacturing companies involved in the production and trade of window components, insulation boards, and EPS materials. Five craft businesses specialized in timber construction, facade and roof systems, and insulation for industrial buildings. Three companies operated as both retailers and manufacturers, offering facade systems, paints, plasters, and insulation products. In addition, two research institutions were included—one with leading an EU-funded project for the implementation of a national take-back-system, and the other on knowledge transfer between academia and industry in the field of timber construction. The sample also involved a cooperative dedicated to use-oriented dismantling and social urban mining and two disposal companies engaged in recycling and digital waste management solutions. Further, a chamber of commerce representing energy-efficient construction interests, and a public business support agency connecting economic, political, and innovation actors. In addition, two of the authors participated in an industry workshop on "Alpine Construction: Shifting Towards a Circular Economy" by the federal state of Salzburg as part of the European Alpine Strategy. The workshop brought together 15 participants from the fields of education, politics, and the economy and the paper's results were discussed and validated.

Drawing on the institutional-pressures literature, in particular DiMaggio and Powell (1983) distinction between coercive, normative and mimetic forces, we first mapped these three pressure types onto the classic business-model pillars of value proposition, value creation and value capture. A draft guideline was pilot tested with two companies. Their feedback led us to simplify legal terminology for small and medium-sized enterprises in the construction sector. The interview guideline addressed challenges and benefits associated with introducing circular activities and processes, CBMs, and material and/or organizational field-related topics. Further, it included the perceived pressures (hinting at institutionalized values and external and internal norms) that organizations experience when shifting towards circular business models. We followed an abductive approach, using these theoretically informed themes as a starting point while remaining open to inductively emerging categories, thereby allowing for iterative refinement of our analytical framework in light of the empirical material. The semi-structured interview guideline covered several thematic blocks: (1) introductory questions on the respondent's role and the company's understanding of circular economy, (2) perceptions of networks and ecosystems relevant to circular value creation, (3) organizational practices and challenges of implementing circular activities and business models, and (4) institutional pressures, including norms, regulations, and societal expectations. While the wording of questions was open to allow narrative responses, each block was linked to theoretical concepts such

as institutional theory and ecosystem/network perspectives. The in-depth interviews were conducted via MS Teams from September 2023 to October 2024 and lasted an average of 45 min. Subsequently, they were transcribed based on audio recordings (Gioia et al. 2013).

To enhance research quality and ensure rigor, we triangulate our interview data (Yin 2009) by an analysis of current and future changes in legislation while screening the internet for information regarding the respective organizations and their circular activities. We collected information randomly, which we considered as facts that manifest their circular value creation, delivery, and capturing practices, and we used these additional insights to corroborate our interpretation.

3.2 Data analysis

Below, we outline the four steps undertaken for data analysis:

Step 1—Initial identification of themes and topics.

Building on the dataset of 17 semi-structured interviews, two focus-group discussions, and one industry workshop, each author first produced an analytic memo that summarized key ideas, verbatim expressions, and non-verbal cues. These memos informed an open-coding round in which all interview transcripts were read line-by-line. Guided by our research question, we flagged segments that spoke to (a) institutional pressures (coercive, normative, mimetic), (b) their impact on the emergence or jeopardization of material and organizational fields, and (c) the three CBM elements—value creation, proposition, and capture. We relied on in-vivo codes wherever possible to preserve informant meaning (Gioia et al. 2013). Coding was performed independently using MAXQDA. Discrepancies were discussed in weekly meetings until consensus was reached, and a shared provisional codebook was finalized.

Step 2—Grouping first-order concepts into preliminary themes.

Following Gioia's second cycle, we iteratively collapsed synonymous or closely related first-order codes into first-order themes. Drawing on Trevisan et al. (2022), we organized these themes within an abductive template: coercive, normative, and mimetic responses, each tagged as relating primarily to the material or organizational field. Constant comparison across cases ensured that themes were not idiosyncratic but recurred in multiple interviews or focus-group exchanges. At this stage, analytic memos were enriched by short literature "mini-reviews" to probe whether emerging patterns resonated with, or diverged from, extant theory—maintaining an abductive dialogue between data and scholarship.

Step 3—Development of second-order themes and aggregate dimensions.

We then asked how each first-order theme enabled or hindered field-level transformation. For the organizational field we traced issues such as actor role definition, lobbying coalitions, and data-sharing agreements; for the material field we examined product-norm formation, feedstock traceability, and technology readiness (DiMaggio and Powell 1983). Through axial coding, convergent first-order themes were elevated to second-order themes. Finally, we integrated these second-order themes into aggregated dimensions representing systemic mechanisms.

Step 4—Mapping enablers and challenges onto CBM components.

In the last step, we linked each aggregate dimension to the CBM triad. Themes that described how actors physically re-process waste were coded as value creation; those that referred to customer promises and legitimacy claims as value proposition; and those dealing with revenue logic, subsidies, or cost structures as value capture. This mapping produced a matrix that juxtaposes institutional pressure type, field locus (material vs. organizational), and CBM component, allowing us to visualize where enablers to cluster and frictions persist. The final data structure—first-order concepts, second-order themes, aggregate dimensions, and CBM mapping—was vetted in a researcher-practitioner workshop for face validity and forms the backbone of our findings and discussion sections (Fig. 1).

4 Results

We analyze coercive, normative, and mimetic pressures and describe how these forces influence circular value creation, proposition, and capturing. We zoom in on illustrative focal interactions regarding how residual material is defined or perceived, e.g., as a resource vs. waste to be disposed of, and investigate how circular material and organizational fields are developed or jeopardized. Our findings document the complexity of finding value in waste streams. The backdrop of this analysis is upcoming regulations in different material fields. We summarize our findings in three trajectories in Sects. 4.1 Coercive pressures, 4.2 Normative pressures, and 4.3 Mimetic pressures.

4.1 Coercive pressures to support circular business model development

Well-designed regulations and subsidies can accelerate circular business models when they offer legal certainty and reward early investment, enabling pioneers to co-develop both infrastructure and policy. Yet reliance on public funding and disputed

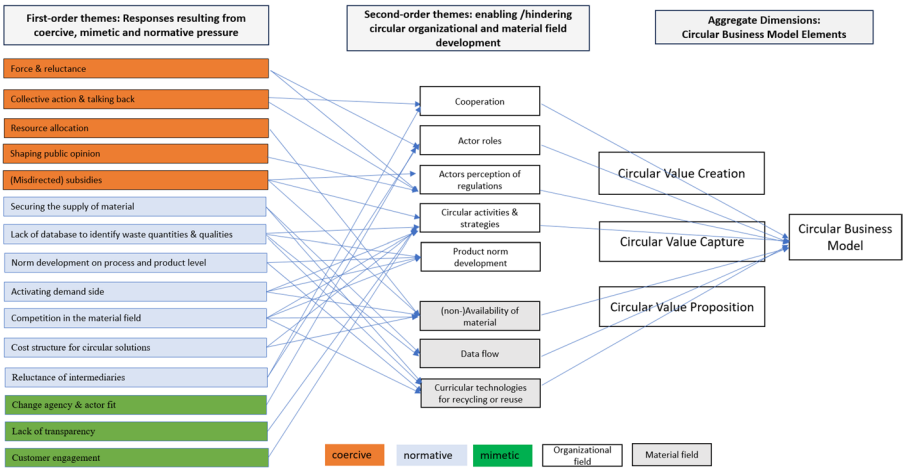

Fig. 1 Illustrative framework for analysis

definitions of "circular" risk creating dependency and uneven competition, impeding the long-term effectiveness of coercive incentives.

Coercive pressures shaping value proposition

Literature suggests that coercive regulatory pressures—combined with financial incentives (e.g. Alonso-Almeida et al. 2021; Arranz and Arroyabe 2023; Esposito et al. 2018; Hossain et al. 2020; Maeder and Fröhling 2024; Pomponi and Moncaster 2017; Wuni 2022), can serve as key drivers for this transition. The following statement of IP3 reflects that the desire for legal certainty and the demand for financing of innovations in the field of material return go hand in hand.

> I think we need early and comprehensive funding for innovation so that we can say early on how we can deal with products that are being returned.

IP7 also explains that establishing effective recycling and reprocessing of products will take a long and joint effort. This requires close cooperation between politics and indust ry as well as long-term investment and technology development. Immediate and drastic measures cannot be implemented, as the necessary infrastructures and technologies need time to develop. However, our data reveal that these frameworks gain acceptance only when they are legitimized by successful circular business models. In this regard, the actors' perception of regulations is fundamentally shaped by the need for legal certainty. As one respondent (IP9) explained,

> […] such a plant […] costs a few million euros. Of course, I only dare to invest if I have the appropriate legal situation to ensure I can get this material for the next few years.

This concern aligns with regulatory precedents such as the Stockholm Convention's ban on hexabromocyclododecane (HBCD) in insulation materials (Stockholm Convention on POPs / UNEP 2013). Boards produced before the ban are excluded from mechanical recycling, while most post-2013 boards are still installed in buildings, leaving no significant stock for safe recycling. This underscores the need to synchronize material field conditions with organizational field dynamics to ensure contextual fit.

Coercive pressures shaping value creation

The value creation and delivery system of a circular business model is critically influenced by how organizations and collective actors respond to regulatory challenges. Front-running firms that invest early in circular practices not only adapt to but also help shape regulatory norms. For instance, in Austria, a disposal company, a gypsum producer, and a construction company established a joint venture for a gypsum recycling plant. As one actor (IP2) remarked:

> […] of course, we try to be faster than the market, faster than legislation—that's why we engage in these research projects. We'd rather work on something ourselves before regulations come into force […].

This proactive stance contrasts with the wait-and-see tactics of other firms, which prefer to observe the success of early adopters before committing significant resources. Our data reveal that actor roles in this context are diverse—ranging from individual companies to professional associations and NPOs—which actively negotiate with policymakers during transition periods accompanying new regulations (e.g., landfill bans, emission limits, recycling quotas). As IP3 quotes:

> […] we are in a dialogue with the Federal Environment Agency regarding new regulations and the feasibility of our systems.

These negotiations underscore the importance of robust data flow across the organizational field. Sharing information on technological infrastructures, waste streams, and resource availability is essential for ensuring that investments in recycling technologies are not jeopardized by regulatory changes. In essence, a stable flow of data (organizational field) is necessary to guarantee the availability of resources (material field), which is a critical input for maintaining continuous operations in a circular system.

Coercive pressures shaping value capture

Within value capture, regulatory measures, such as subsidies and grants, are pivotal in incentivizing circular activities and strategies. These financial supports are intended to make the use of secondary raw materials economically viable and to drive the innovation necessary for circular practices. However, our findings indicate that the long-term impact of such subsidies is uncertain. For example, the scaling back of funding has exposed companies' dependency on continuous governmental support, suggesting that without sustained incentives, there is a risk of reverting to linear business models. IP2 illustrates this for a subsidy for recycled panels in Italy, which led to Austrian construction companies artificially engaging in the Italian market to receive subsidies:

> 110% subsidy, which means he [the owner] renovates his house for €50,000 and gets €55,000 back. It was an absolutely absurd system, which meant that everyone throughout Europe put every recycled material they had into the product and went there [to the Italian market] […] we drove all the way to Naples. We normally drive 100 km with our EPS products, maybe 150. […] You could say that recycled material has been artificially generated to meet these requirements.

Another critical issue pertains to circular product norm development. The definition of what constitutes "circular" remains contested among various stakeholders, including manufacturers, processors, and regulatory bodies. Such disagreements can lead to market distortions, as illustrated by the "Austria is not quite tight" subsidy program, where insulation materials made from renewable resources received higher subsidies than those derived from non-renewable sources. This divergence in actor's perception of circularity complicates the process of establishing consistent circular product norms. In IP18 opinion, this results in unfair competition between different materials:

> What I think would have an extremely positive effect in the discussion is […] [when] materials are considered with the same care and […] accuracy […] The argument is often that an insulating material made from renewable raw materials is great because if I dismantle it, I can compost it. 100% nonsense […].

Here, the successful implementation of frontrunner business models that adhere to regulatory requirements can serve as a benchmark for normative development, fostering isomorphism among imitators, yet only when these models prove to be both viable and replicable.

4.2 Normative pressures to support circular business model development

Standards, certifications and public-tender criteria articulate clear circular benchmarks, but weak end-market demand, fragmented actor networks and poor waste data still impede large-scale material return and reuse. High reverse logistics costs and tensions between product differentiation and calls for harmonized material norms further constrain the economic viability of circular strategies.

Normative pressures shaping value proposition

Normative pressure shapes the value proposition by establishing circular benchmarks that organizations are expected to meet. In public tenders for projects such as schools and hospitals, circular standards tied to quality seals and certifications (e.g. ÖGNI 2023) are becoming increasingly common. However, despite the Recycling Construction Materials Regulation being in effect since January 2016, a gap remains between normative pressure and actual market demand. This tension is reflected in the construction industry's current landscape, where the pressure to comply with circularity standards is rising, yet demand in the material field for recycled or circular products remains moderate. Moreover, while property developers are beginning to use circular materials, their decisions to define an attractive circular value proposition often hinge on financial incentives rather than a fundamental commitment to sustainability. As one interviewee (IP15) explained:

> […] there are very attractive subsidies for renewable insulation materials. […] this […] housing developer is now switching from insulation material to a renewable insulation material. Not with the motivation to build green, I'm implying, but because it simply pays off more.

The case reveals how sustainability logics are subordinated to economic logics, as regulatory incentives transform green practices into financially motivated strategies, thereby exposing the symbolic rather than substantive role of sustainability within the organizational field.

There is also limited pressure from private consumers, particularly in the residential construction sector. Homeowners, typically constrained by budget considerations, tend to prioritize cost over sustainability and circularity. Moreover, sustainability constitutes a complex domain requiring expertise that most homeowners, who often build only once in their lifetime, do not possess. Consequently, quality seals and

certifications may serve as important tools to guide decision-making by providing recognizable indicators of sustainable practices.

These statements and insights encapsulate the inherent chicken-and-egg problem: without sufficient market demand, organizations hesitate to invest in circular practices and strategies, which in turn dampens the supply of circular products. This weakens the development of the material field conditions.

Normative pressures shaping value creation

The construction sector's value creation and delivery system are complex, involving a wide array of actors, from general contractors and subcontractors to dealers and individual homeowners. This complexity poses significant challenges to the return and reuse of materials. For instance, initiatives to implement return systems for materials like mineral wool hinge on the coordinated efforts of dealers and construction companies. One participant (IP6), working on introducing a return system for mineral wool, described the situation:

> Products are ordered through dealers and delivered to construction sites, with awareness of the return system spread by the sales team, though not effectively.

The main reasons for the reluctance of dealers are that acting as an intermediary in the return process would require them to take on a coordinating role between producers and construction companies, which involves additional administrative effort and logistical complexity. They do not want to function as subcontractors who are responsible for ensuring that materials are returned properly. Instead, they see their main responsibility as supplying materials to construction projects rather than managing what happens afterward. This reflects the dominance of market and professional logics, as they prioritize their role as material suppliers and reject the additional costs and responsibilities of return systems, thereby sidelining sustainability logics as secondary or symbolic. As interviewee IP16 continued to note:

> The return system is 'nice to have' but not a priority due to the low level of acceptance and interest from processing companies and customers.

This reluctance is compounded by the fragmented procurement channels in the industry. General contractors, subcontractors, and individual homeowners create a dispersed network where ensuring a reliable flow of information and materials is challenging. Indeed, a lack of accurate data on waste quantities and material quality further complicates investment and operational planning. As IP9 observed:

> Many companies don't even know exactly how much waste they dispose of. They don't know what fractions, qualities, and quantities, although quantity is a relatively trivial matter from my point of view.

Furthermore, the grouping of materials into overly broad categories exacerbates the data issue. For example, IP2 explained:

> […] there are exactly two waste identification codes. There is no distinction between building materials and packaging, and there is no distinction between XPS and EPS […].

Such information deficits undermine the reliability of secondary raw material streams, making it difficult to ensure that sufficient and consistent material is available for recycling. Our data show that these factors are the major reason why value creation and delivery systems still remain in linear logic, with organizations mainly using virgin materials. Concerns persist regarding the sufficiency or non-toxicity (e.g. free of HBCD) of secondary raw materials. As IP7 warned:

> […] there might not be enough material to collect [from e.g., demolitions], because it's also extremely expensive.

Additionally, external factors such as political unrest, environmental disturbances, or even an energy crisis further complicate material supply security. Other actors, however, are more on the positive side, as one respondent (IP9), a waste disposer, noted a positive shift driven by current energy concerns:

> […] now we are really generating money from the waste, now the area is also being looked at.

Such material field-related challenges underscore the need for reliable data and improved transparency. Digital platforms, aligned with initiatives such as the Corporate Social Reporting Directive (CSRD) and the concept of digital product passports, are being considered to enhance information flow, standardization, and data sharing across the construction sector.

Normative pressures shaping value capture

Normative pressures drive value capture, particularly through initiatives aimed at stimulating circular strategies and activities via subsidies and incentives. However, economic feasibility remains a major challenge. When designing reverse supply chains for secondary raw materials, especially in anticipation of regulatory measures like the landfill ban on mineral wool, cost allocation is a critical issue. One respondent (IP6) described the cost structure of the proposed return system:

> If the customer [e.g., a construction company] does not adhere to the rules, they will be charged an additional fee. This fee and the actual handling costs serve as an extra incentive for the customers to educate their staff. It reinforces that the bags are specifically for mineral wool, not EPS or other materials.

Yet, most construction companies reject this return system due to the additional costs imposed. As another interviewee (IP13) remarked:

> We are all under cost pressure, and if we're expected to collect the material ourselves, load it into a vehicle, bring it to a collection point, and pay for the big bag, that seems like an unrealistic expectation from the industry.

Even when considering the benefits of reintroducing secondary raw materials into production, the overall expenses, especially due to logistics, can offset raw material cost savings. As IP6 further notes:

> The overall expenses can become comparable or even higher due to logistics, which can cause additional costs.

On the product norm development front, establishing standardized processes for the sorting, restoration, and resale of materials is essential to maximize the value of secondary raw materials. As one participant (IP8) explained:

> […] we need a separate process for each trade […] when dissembling [a product or a building], then the product goes through a restoration process, including testing and resale. […] the end consumer or the company or planner can say: great, I'll take that, it's harmless, it's like a new product only made from secondary materials […].

Therefore, several interest groups are advocating for the establishment of new product norms that would facilitate the reuse of secondary raw materials in the construction sector. As highlighted by IP15,

> […] I have also suggested that industry associations should address deconstruction and recycling. Even though the formulas differ […] it should be possible to melt down mineral wool fibers. […] I believe joint efforts at the association level would move us forward.

Whereas that would be ideal from a recycling perspective, standardization comes at a cost: it reduces product differentiation, a key competitive factor in today's market. As IP18 noted,

> Well, agreeing on a formula is a Christmas wish, isn't it? It's the same as when you say all bakers agree on the same recipe for bread, and then it doesn't matter which one I go to.

In sectors where proprietary formulas or processes set companies apart, mandatory uniformity can quickly change from a boost for circularity in the material field to a threat to differentiation in the organizational field. Mineral wool producers therefore resist a single recipe, fearing it would weaken their brands and slow product improvement. This highlights a deeper tension: shared standards accelerate recycling, yet they can also erode the uniqueness that protects firms' margins and market position. This pushback is more than stubbornness; new rules could shift power in the industry by changing who controls key capabilities and customer ties. Many stakeholders therefore urge industry-association talks to craft standards that enable recycling while still leaving room for competition.

4.3 Mimetic pressures to support circular business model development

With limited external pressure, only a handful of pioneers experiment with circular offerings, and widespread greenwashing as well as consumers' preference for convenience dilutes the credibility of genuine initiatives. In the absence of viable best practices, firms are hard to mobilize, and price competition keeps most firms from investing in circular product lines.

Mimetic pressures shaping value proposition

Our data show that the pressure to close circles for secondary raw material use in the industry is low. It is typical for pioneers to drive changes as there are not best practices and solutions available that could be imitated at this point. As IP16 reports, it is

> […] a result of our own interests, our company philosophy, and our mission statement. Of course, we are also aware that the market will increasingly demand things in this direction, but we don't feel any pressure yet. But we want to be prepared when the pressure comes […].

In line with (North 1990) our results show that when pioneers decide to cooperate to create value from waste the organizational fit is very important for the evolution of the organizational field, as IP9 explained:

> It is not only important that the area of activity fits, but the company also has to fit together [in terms of corporate culture] […] otherwise, it won't work.

Although there are still few large-scale solutions for closed material cycles in the analyzed construction sector, tests are being carried out, e.g., in cooperation with universities that are developing recyclable products, material designs, processes, and impact measurements.

IP15 illustrates the challenges of getting customers to adopt a new solution. They offered two types of concrete, one with recycled aggregate and the other one without recycled aggregate that came with a dissolvable bag

> […] we initially distributed them through [name of the retailer]. They placed both products side by side on the market at the same price. The dissolvable bag concrete sold well, while the recycled aggregate concrete remained on the shelves. This clearly shows that consumers prioritize what is simple and convenient for them.

Weak coercive and normative pressure lets greenwashing flourish, eroding trust. Company websites boast "our DNA is green", "all of our products are circular ready," and "50% of our processed raw materials are made from recycled materials", yet staff concede that practice lags behind rhetoric. Group-discussion participants said this noise makes real progress hard to signal; they favor demonstrating sustainability

through specific product lines, warning that superficial claims by rivals threaten both credibility and competitiveness.

Mimetic pressures shaping value creation

Our data show that creating a mimetic dynamic for value creation and delivery from waste is difficult within the construction industry, as it is challenging to mobilize B2B partners and customers within the organizational field to join in circular practices. IP3 illustrates questions like,

> How can we collaborate with customers to develop return and reuse concepts? […] We are now trying to create these collaborations and figure out how we can extend the lifecycle of our products and offer services that benefit the customer.

Mimetic pressures shaping value capturing

As IP1 explains, the market has shifted since the COVID-19 pandemic, moving from an all-time high to intense price competition, where businesses in a B2B setting are pressured to lower prices. Customers do not notice this, as consumer prices for things like windows and facades rise while B2B prices drop. The profit margins are unclear, with someone benefiting but not in the intermediate stages. This lack of transparency forces companies to delay projects like working on more circular product solutions, as they are currently not profitable, with manufacturers caught up in the price war.

Together, the cases show that circular diffusion is based on three interlocking mechanisms: (i) regulatory clarity that anchors capital expenditure; (ii) network coordination that spreads logistic and informational costs across fragmented actors; and (iii) market signaling, i.e. credible success stories and transparent profit formulas that transform isolated pilots into imitable CBMs. Where any link is weak, incentives fragment, and progress stalls beyond best practices. Table 2 below summarizes the three trajectories and the respective contents for circular value proposition, circular value creation, and circular value capture.

5 Discussion

While the potential for waste valorization, i.e., value creation, proposition, and value capturing of secondary material in a shifting business system (from linear to circular economy) has been acknowledged, the specific establishment of circular material and organizational fields required for legitimizing waste as a resource is still not well-defined. We contribute to theory in three ways: First, we add theoretical insights on the shift from linear to circular economy as an institutional change and specify "material fields" as the locus where CBMs are enabled through cooperation, data sharing, and complementary roles. Second, we extend institutional theory by showing how coercive, normative, and mimetic pressures are negotiated through interactions and collective institutional work. Third, we contribute empirically to the construction context by detailing how residual materials become resources only when interdepen-

Table 2 Overview of results

	Trajectory #1 – Coercive pressure	Trajectory #2 – Normative pressure	Trajectory #3 – Mimetic pressure
Value proposition	Regulatory instruments (landfill bans, quotas, subsidies) create strategic opportunities when accompanied by legal certainty; transparent, financially supported rules confer legitimacy on circular claims.	Certifications and public tender criteria articulate circular benchmarks, yet adoption is still predominantly subsidized; weak consumer demand perpetuates a mutually reinforcing deficit between supply of and demand for circular solutions.	Limited external pressure means that mainly pioneering firms articulate circular value propositions; prevalent greenwashing and consumer preference for convenience attenuate their credibility.
Value creation	Early adopters co-invest in recycling facilities, exchange waste stream data, and engage regulators during policy formulation; reliable material flows support continuous circular operations.	Fragmented actor networks and inadequate waste data inhibit return systems; distributors resist additional logistical complexity; digital product passports are proposed to facilitate coordination.	Mobilising business partners for return and reuse remains challenging; most collaborations are confined to pilot projects, constraining imitation and scaling.
Value capture	Subsidies enhance the economic viability of secondary inputs but can engender long-term dependency and market distortion; contested definitions of "circular" create uneven competitive conditions.	High reverse logistics costs deter participation; debates persist over cost allocation and standardised restoration processes; product differentiation objectives often conflict with calls for common material specifications.	Intensified price competition erodes margins; limited transparency regarding profitability postpones investment in circular product lines, thereby restraining wider adoption.

dencies are coordinated, thereby addressing a noted gap beyond design/technology reviews, and by identifying mechanisms that explain why CBMs are still rare. In the following, we explain these contributions in more detail:

First, we integrate insights from institutional theory and CBMs by highlighting the transition from a linear to a circular economy as an "institutional" change (Micelotta et al. 2017). This change is difficult for the following reasons: Our findings reveal that institutional actors often lack a shared definition of circularity: while proactive frontrunners focus on early adoption, the wait-and-see actors partially aggressively lobby to influence policy. Simultaneously, the redefinition of waste by distinguishing between materials regarded as discards and those repurposable as secondary raw materials legitimizes the latter as substitutes for virgin material. Building on Vargo and Lusch (2008) and Fehrer and Wieland (2021), we show that successful CBMs rely on cooperative interactions, data sharing across waste streams, and complementary stakeholder roles, essential for emerging material fields. These material fields refer to interconnected constellations of resource-integrating actors that function in a largely self-adjusting manner, held together by shared institutional logics and the pursuit of mutual value creation. (Akaka and Vargo 2015; Vargo and Akaka 2012), yet their implementation is complicated by competition over residual materials. More-

over, although coercive regulatory pressures can level the playing field for circular practices (Gunningham and Sinclair 1999; Zhu and Sarkis 2007), they may also be perceived as market-distorting, underscoring the complex interplay between external forces and internal organizational dynamics in shaping circular value creation, value proposition, and value capture.

Second, we extend the institutional theoretical lens by exploring the dynamic interplay among coercive, normative, and mimetic pressures in CBM development. Our analysis reveals that these pressures do not operate simply top-down; instead, they are continuously negotiated through iterative, reciprocal interactions among institutional actors. In these negotiations, relationships are central, as actors reinterpret regulatory mandates (coercive pressures) alongside shared industry expectations (normative pressures) and emulative behaviors (mimetic pressures). Organizations leverage advocacy and lobbying (Lawrence and Suddaby 2006; Lebelhuber and Greiling 2022) to influence policy frameworks, yet such efforts may provoke criticisms of hypocrisy, especially in contexts of declining virgin material prices and persistent technical recycling challenges. This not only shapes the evolution of circular material and organizational fields but also underscores the critical role of power relations in the institutionalization of circular economy practices. In line with Bocken and Shirahada (2025), who highlight the notion of "collective institutional work" to reflect the involvement of diverse stakeholders in the development of circular strategies, our findings also demonstrate how different actors actively shape and influence the institutional conditions that enable or constrain circular transitions.

Third, while the literature on CBM development in the construction industry has called for greater attention (e.g. Benachio et al. 2020; Guerra et al. 2021), there has been a strong focus on systematic literature reviews on, e.g., technical focus, product design, or digitalization. This is especially important in sectors with a significant environmental impact, such as construction, known for its high resource consumption and low recycling rates (Benachio et al. 2020; Charef and Lu 2021; Çimen 2021). So far, little is known about using residual material waste as a resource, which can only turn into CBMs if actors interact and understand their interdependencies, as outlined by Ramaswamy and Ozcan (2020). Results confirm that the prevalent approaches have had a reductionist interpretation of the CE concept, where reduce and reuse actions linked to deeper revisions of business models are still avoided (Calzolari et al. 2025).

The case is grounded in the Austrian construction sector, which is project-based, fragmented, procurement-driven, and characterized by local material flows. Those are features that increase coordination costs and make secondary-material quality and timing unusually variable (Benachio et al. 2020; Charef and Lu 2021; Çimen 2021). Several mechanisms are, however, easier to generalize: First, capital formation depends on legal certainty and predictable rules (Gunningham and Sinclair 1999; Simpson 2012; Zhu and Sarkis 2007). Second, contested definitions of "circular" reflect institutional complexity that recurs across sectors (Greenwood et al. 2011; Micelotta et al. 2017; Pache and Santos 2013). Third, effective reuse requires shared data infrastructures and resource integration in service ecosystems (Akaka and Vargo

2015; Chen and Thapa 2025; Fehrer and Wieland 2021; Vargo and Lusch 2008) and diffusion benefits from anchor buyers and credible reference cases that trigger imitation (DiMaggio and Powell 1983). The relative weight of coercive versus normative and mimetic pressures may shift in other geographies, e.g., with different enforcement capacity or procurement regimes but the core patterns of rule clarity, network coordination, and market signaling are likely to be comparable (Nayak and Bhushan 2019).

For companies, they highlight to reconcile circular–linear tensions through hybrid strategies that combine structural and relational moves: launching pilots while sustaining core operations and craft contracts (take-back, buy-back, quality specs) that enable value co-creation across the chain (Ramaswamy and Ozcan 2020; Vargo and Lusch 2008). They build coalitions and participate in collective institutional work, i.e. standard-setting, lobbying, and field-level projects, to shape workable norms without eroding differentiation (Bocken and Shirahada 2025; Fehrer and Wieland 2021). To lower coordination frictions, firms invest in data infrastructures (e.g., product and material passports) and align incentives via public procurement, benchmarks, and offtake agreements that strengthen normative and mimetic pull (Castro-Lopez et al. 2023; Cesinger et al. 2022; Köhler et al. 2022). Transparency tools, e.g., dashboards and disclosures, counter symbolic circularity and support legitimacy, aiding institutionalization over time (Fleming and Jones 2012; Pope and Wæraas 2016).

In the following, we outline different trajectories of institutional pressures supporting or prohibiting CBM development. Manipulating the conflicting field of protective competitiveness with current linear practices vs. creating circular organizational and material fields for competitive advantage is a major challenge for organizations (see Fig. 2 below).

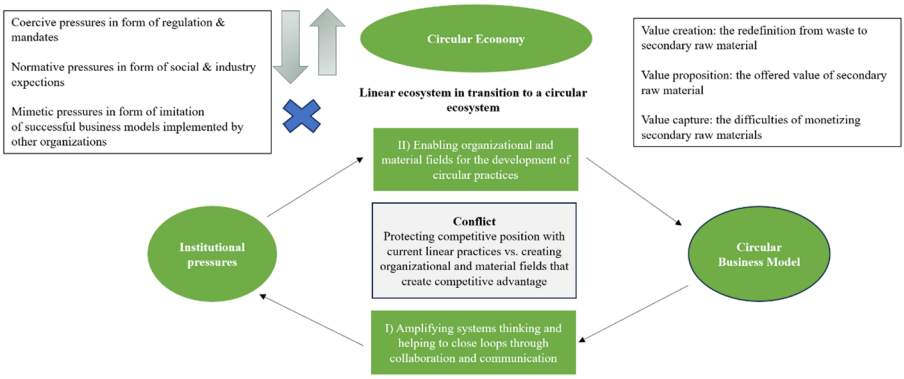

Fig. 2 Trajectories of coercive, normative, and mimetic pressure for circular business development

5.1 Trajectory #1: Coercive pressures to support circular business model development

Our data underscores the pivotal role of coercive pressures, i.e. manifested through national and international regulatory frameworks such as environmental legislation, tax incentives, and subsidies, in shaping CBM trajectories. These pressures influence the fate of material waste, determining whether it is landfilled or reintegrated into material cycles as secondary raw material. This finding is consistent with earlier research emphasizing the moderating influence of regulatory mechanisms on organizational greening behavior (Simpson 2012; Zhu and Sarkis 2007), and highlights how policy instruments can level the playing field for circular alternatives vis-à-vis environmentally harmful but cost-effective virgin materials (Gunningham and Sinclair 1999; Zhu and Sarkis 2007).

However, our findings also demonstrate that coercive pressure is not unidirectional or uniformly applied. Instead, regulatory landscapes are shaped through negotiation processes in which power and dependency relations between organizations and policymakers play a central role. Particularly, actors that are hesitant to adopt circular practices, often engage actively in lobbying and advocacy, using collective action (Scott 1995) through industry associations or direct institutional channels to shape regulatory frameworks to their advantage. This strategic engagement not only reveals the contested nature of regulatory development but also introduces tensions around legitimacy, as organizations seeking to capture value from residual materials may be accused of circularity-washing (e.g., fossil-based products), especially considering declining virgin material prices and a lack of scalable technological solutions for recycling demolition waste. At its core, this is a question of legitimization: What materials and processes are defined as "truly sustainable" and acceptable within CBMs?

While participatory policymaking is praised for reflecting the lived realities of organizations (DiMaggio and Powell 1983), such negotiation dynamics can slow systemic change and dilute the transformative potential of coercive instruments. This makes the current debates over material choices and process standards particularly significant, even if they slow down the transition to circularity. Once major financial investments are made in CBM development, they must be viable in the long run. Given that institutional change is inherently difficult, as e.g. Zucker (1987) highlights, once new standards solidify due to isomorphism (DiMaggio and Powell 1983), they become embedded and resistant to future adjustments. Therefore, despite the apparent delays, carefully negotiating these standards now could be beneficial, ensuring that the industry does not lock itself into suboptimal or unsustainable solutions that later prove difficult to revise.

As our data suggests, regulatory pressure can only effectively stimulate CBM innovation if such frameworks are perceived as legitimate, widely adopted, and not

viewed as market-distorting relative to regions with laxer environmental standards (Nayak and Bhushan 2019).

5.2 Trajectory #2: Normative pressures to support circular business model development

While research highlights that normative and regulatory frameworks can mitigate institutional tensions by providing shared standards and fostering cooperation and innovation (Castro-Lopez et al. 2023; Cesinger et al. 2022), our data emphasize that cooperation is not merely a consequence of institutional alignment, but a critical precondition for building the organizational and material fields necessary for CBM development. Consequently, a focus on circular transition cannot be limited to the social and institutional dynamics of organizational fields but it must also consider the material field, as it defines the boundaries of what is organizationally possible. At the same time, organizational fields shape how material flows are governed and reused, so that material and organizational fields mutually constitute and limit each other. Therefore, circular value creation requires coordinated efforts across diverse actors, such as material producers, construction firms, logistics providers, and policymakers, who must jointly engage in knowledge exchange, data sharing, and role alignment across the value chain. However, this cooperative infrastructure remains underdeveloped. Challenges in the material field, such as the unpredictable availability and inconsistent quality of secondary materials intersects with the absence of centralized data infrastructures to track waste flows, and unresolved questions about cost allocation in material returns continue to erode trust among actors and impede collective action in the organizational field. As a result, many organizations fall back on linear business model logics, prioritizing traditional material streams and short-term competitiveness over systemic transformation (Fehrer and Wieland 2021).

This sustains an organizational field that structurally favors incumbents adhering to linear practices, thereby creating tensions with stakeholders who aim to embed circularity into their business models (Pache and Santos 2013). Even though normative and mimetic pressures such as professional standards, peer benchmarking, or perceived best practices, are intended to promote convergence around circular practices, our findings show that these pressures themselves are subject to negotiation, contestation, and power dynamics. Cooperation, rather than being automatic, must be actively cultivated amid divergent interests, resource dependencies, and varying levels of institutional commitment.

Frontrunner organizations often interpret circularity as a source of innovation and future value, seeking to establish new cooperative constellations that make use of residual materials. In contrast, others resist such shifts, citing price pressure, operational complexity, and the risk of competitive disadvantage. This reflects the presence of institutional complexity (Greenwood et al. 2011), where organizations must navigate competing logic: economic profitability versus environmental sustainability and individual firm interests versus systemic change.

While there is widespread rhetorical agreement on the need to reduce emissions and transition toward more sustainable practices, strategic paths toward circularity

vary significantly. These divergences give rise to competing interpretations of circular economy goals in the material field, making it unclear which practices are deemed legitimate or desirable for developing circular business models based on secondary raw materials (D'Aunno et al. 1991; Scott and Meyer 1994).

5.3 Trajectory #3: Mimetic pressures to support circular business model development

Our findings reveal that mimetic pressures, i.e. those arising from imitation and benchmarking practices, remain underdeveloped in the context of CBM development in the construction sector. Only a few pioneering organizations have actively advanced circular strategies, positioning themselves as institutional entrepreneurs (DiMaggio and Powell 1983). These frontrunners mobilize resources, redefine interorganizational relations, and experiment with alternative business models, thereby acting as agents of institutional change. By steering material and organizational fields toward circularity, they help legitimize the use of secondary raw materials and drive new pathways for value creation (Alonso-Almeida et al. 2021).

However, these actors remain exceptions rather than the norm. Most organizations still operate within fragmented and weakly coordinated material and organizational fields, where cooperation is not structurally anchored. By sampling across these interconnected roles, and by purposefully including hybrid constellations, we could observe how material interdependencies structure organizational roles, induce boundary-spanning activities, and shape the coordination required for return logistics. For example, producers may develop recyclable materials, yet circularity depends on processors, demolition firms, or wholesalers to ensure their return. Therefore, circularity cannot be attributed to individual organizations alone but emerges only through coordinated interactions across the value chain. Organizations hold diverging expectations and interests regarding the reuse of materials: producers demand transparency over the downstream application of their goods; retailers often lack oversight over where materials end up and are hesitant to share information; end-users and processors typically prioritize cost and convenience. These fragmented expectations not only hamper the cooperative structures essential for effective circular value capture but also reveal asymmetries in information, trust, and accountability within the value chain.

As a result, mimetic pressure remains low, not only because of the absence of dominant CBM archetypes but also due to the limited diffusion of best practices and shared standards for reusing materials. Organizations frequently refer to circularity in strategic communication, yet our data indicate that such references often serve symbolic or rhetorical purposes rather than reflecting substantive change (Fleming and Jones 2012; Pope and Wæraas 2016). This legitimacy-seeking behavior, in the absence of structural field change, prevents circular strategies from becoming institutionalized.

Moreover, finding value in waste is not a linear firm-level decision but a systemic reconfiguration of the organizational and material field, which requires relational coordination, multi-actor engagement, and shared data infrastructures (Fehrer and

Wieland 2021; Vargo and Lusch 2008). While value co-creation and resource integration are central tenets CBMs, our data show that cooperation across sectors, functions, and organizational boundaries remains insufficiently institutionalized, despite its critical importance (Köhler et al. 2022; Pan et al. 2023).

Additionally, concerns persist regarding the perceived trade-off between circular transformation and financial performance, which further impedes cooperative momentum. These concerns reinforce a default allegiance to linear practices and perpetuate the institutional legitimacy of defining waste as material to be discarded, rather than as a resource to be reintegrated. Consequently, mimetic pressures fail to materialize at scale, and the diffusion of CBMs remains stalled due to the lack of shared templates, cross-sectoral alignment, and institutionalized cooperation mechanisms.

To strengthen mimetic pressure, construction sector leaders and policy makers can orchestrate benchmarking projects to learn from circular practices. First, demonstration projects should publish open dashboards detailing costs, carbon savings, and payback periods. Second, sector-wide benchmarking conferences could discuss key indicators, e.g., share of secondary inputs, design for disassembly scores, or data transparency. Third, industry associations should pair SME contractors with large manufacturers, providing matchmaking, legal templates, and contract boundaries. Fourth, anchor buyers, e.g., public building projects can issue procurement tenders could request specific requirements and payment methods that enable CBMs.

6 Conclusion

As discussed in the previous section, the following main points can be summarized. First, actors still lack a shared definition of circularity. Hence, they renegotiate what counts as waste vs. secondary raw material. Cooperation, data sharing, and complementary roles are needed to build material fields. However, rivalry over residuals and perceived regulatory uncertainty hamper this process. Second, coercive, normative, and mimetic pressures co-evolve through negotiation rather than a clear process. Lobbying reshapes rules and can provoke legitimacy. Hence, collective institutional cooperation across stakeholders is essential. Third, despite high resource impacts, circularity is still limited. The study finds technical, regulatory, and business model redesign gaps. Hence, valorizing residuals requires recognizing and managing actor interdependencies. Regarding institutional pressures, coercive policy can redirect material flows if seen as legitimate and meaningful. Normative pressures demand active cooperation, shared data infrastructures, and trust. Mimetic pressure remains comparably less developed, lacking clear best practices or industry role models.

6.1 Managerial implications

From a managerial perspective, understanding coercive, normative, and mimetic pressures in circular construction ecosystems is vital to developing business models,

particularly in industries reliant on material waste, such as construction. First, transitioning from a linear to a circular economy requires proactive leadership. Managers must recognize that institutional change is not just a regulatory or technological shift but involves rethinking entire business models. To remain competitive, managers should actively engage in industry collaborations, resource mobilization, and knowledge-sharing networks resulting in "symbiotic ecosystems", (Fehrer and Wieland 2021), but also internally sensitize their employees to sustainability issues (García-Cruz et al. 2024), as these factors are essential to establishing organizational and material fields conducive to circular economy practices. Further, coercive pressures must be understood and responded to in a proactive rather than reactive manner. So far, many companies in the construction industry have a rather doubtful approach to regulation in the direction of the circular economy. As an example in response, small demolition firms could sign contracts and exchange information directly with cement plants. If the demolition contractors know how to sort and separate cement waste, the cement plants could recycle it more easily, increasing viability for both sides.

Secondly, the dialectical tensions between linear and circular business practices suggest that managers must balance coercive, normative, and mimetic pressures. Regulatory compliance should be seen not as a burden but as a strategic opportunity to innovate (Ika et al. 2024). Organizations should engage in lobbying efforts to influence legislation positively, while also investing in scalable recycling technologies to handle residual materials better. This strategic alignment can prevent the potential backlash from accusations of greenwashing and enhance long-term competitiveness in a market gradually shifting toward sustainability. In this context, mimetic pressures should be better understood from other industry sectors than the direct company environment. For instance, answering to the EU's landfill ban, recycled materials such as gypsum could be classified as a secondary raw material, allowing to move from a linear logic to a circular one. For this, regulation should offer an easy and viable solution if imposing bans.

Third, the importance of normative pressures highlights that leading organizations must drive change by adopting circular practices even when they face uncertainty or lack of full industry cooperation. Managers should focus on transparency and accountability in secondary material use, facilitating trust and partnerships across the value chain. Developing stakeholder trust can enable better cooperation and mitigate the fragmentation currently hindering progress. For instance, raw material suppliers, component manufacturers, construction companies, and logistics firms could develop a specific product passport or material passport. If components need to be replaced, specs, maintenance, and chain-of-custody data are auto-triggered by the passport to initiate a buy-back at pre-agreed prices.

Lastly, the relatively low mimetic pressures imply that managers in leading firms can act as institutional entrepreneurs, spearheading innovation and fostering legitimacy for CBMs. By setting industry benchmarks, engaging in transparent value chains, and showcasing the financial viability of CBMs, firms can create new competitive advantages while addressing environmental sustainability goals. Examples

could include recycled materials listed in a publicly accessible dashboard showing procurement costs, carbon savings, and payback time associated to public funding. The transparent metrics could help to silence greenwashing critiques and lead to companies adopt respective action to attract funding.

6.2 Policy implications

The study's findings underscore the need for policymakers to establish robust frameworks that support the transition to a circular economy, particularly by recognizing waste as a resource. Coercive pressures, such as regulations and incentives, must be designed to promote sustainable practices while discouraging linear business models that rely on waste disposal. Governments can enact stricter environmental regulations, offer tax deductions, and provide subsidies for companies that invest in recycling technologies and secondary material use, thus leveling the playing field between regions with varying environmental standards. Tax subsidies or other incentives could enhance the missing aspect of value capture mechanisms.

Policymakers should also address the gaps in technical scalability for recycling hazardous materials, such as demolition waste, by funding research and innovation in this area. Regulatory frameworks should support the development of clear industry standards and certifications to reduce mistrust and uncertainty around secondary material use. This would enable smoother collaboration across the value chain. Finally, policymakers need to facilitate the formation of networks and platforms where stakeholders from different sectors can exchange best practices and align on circular economy goals to drive systemic change. Cross-sectoral collaboration between public and private stakeholders should be encouraged to foster knowledge sharing and create standardized guidelines for circular business model development. Other ideas include addressing trust issues via technological solutions, secure data transfer and storage solutions, or proactively approaching companies in the construction industry that lack knowledge of circular business models.

6.3 Limitations and future research

Due to its method and scope, the present article has several limitations that will be further discussed below. First, the research is limited to a construction ecosystem in Austria. Hence, its generalizability is limited in scope and geographical or cultural conditions. In response, future research should broaden the focus to other regions. This could lead to uncovering specific conditions of institutional pressures and adequate responses to different forms of legislation or public opinion, among other things.

Second, empirical data is limited to qualitative data. This has a certain bias, potentially overemphasizing certain participant statements. Future studies should, therefore, employ additional methods, such as quantitative approaches, to complement the qualitative findings and provide a longitudinal perspective.

Third, this research is limited to specific areas of the construction industry, particularly insulation materials or the external building envelope. Hence, for future research, we recommend investigating further areas of the construction industry that

might act differently in terms of experienced institutional pressures and adequate business model responses. This could include areas such as alternative materials to concrete.

Regardless of directly addressing this study's limitations, the findings open several avenues for future research on CBM development and waste valorization. First, further investigation is needed to explore the specific mechanisms by which organizational and material fields evolve in different industries, particularly beyond construction. Comparative studies across sectors could shed light on how different regulatory, cultural, and market contexts influence the pace and nature of circular economy transitions.

Second, future research should address the design-implementation gap of CBMs. Studies could examine how organizations can overcome the challenges of integrating circular practices into existing linear systems, focusing on the role of several enablers in driving systemic change. In particular, this requires investigating the transferability of the results to other context outside Austria or to other industry sectors.

Third, the dynamics of collaboration among stakeholders need to be examined, particularly in fragmented industries where competition for residual materials is high. Understanding how trust and cooperation can be fostered across value chains, particularly when lacking transparency, will provide insights into more effective circular business model implementation.

Finally, the role of institutional entrepreneurs in driving circularity deserves deeper exploration. Investigating how leading organizations can act as change agents, influencing regulatory frameworks and industry norms, would offer valuable insights into the factors that facilitate or hinder the transition to a circular economy across different contexts.

In sum, our study advances theory and practice by framing the circular economy shift as contested institutional work: actors must first settle what counts as a secondary resource, then align coercive, normative, and mimetic pressures that are constantly renegotiated through lobbying and cooperation that must be formed. CBMs therefore hinge on inter-firm cooperation, data exchange, and trust to offset rivalry over residuals and regulatory uncertainty.

Thereupon, practice can develop contracts for cooperation that are supported by legislation. For this, legislation should not act in a preventive but transformative way and develop incentives that are closely developed together with the construction industry, including its many small firms. Finally, digital solutions such as product passports are still uncommon in this industry but could help to enhance traceability and transparency.

Appendix A

See Table 3.

Table 3 Overview of participants

IP	Company	Focus area	Position of interviewee(s)	Number of employees
1	Manufacturing company	Manufacturing and trade of window components	Group discussion 1: Four members of the management teamand one interviewer Group discussion 2: Two members of the management team and one interviewer	2.300
2	Manufacturing company	Manufacturing and trade of insulation boards	Head of Research and Development	400
3	Manufacturing company	Manufacturing and trade of window components	Same company as IP 1: Group discussion: 2 Members of the management team	2.300
4	Research Institution	Project lead in a project for EPS/XPS recycling	Project Manager Digital Logistics and Automation	30.000
5	Research Institution	Knowledge transfer between universities and companies with focus on circularity in timber construction	Team leader for wood-based materials development and digitalization agendas	150
6	Manufacturing company	Manufacturing and trade of insulation boards	Sustainability Manager Central Europe	6.000
7	Manufacturing company	Manufacturing of EPS for the construction and packaging sector	Department Manager Sustainability	200
8	Cooperative for use-oriented dismantling	Assists clients with deconstruction in social urban mining and circular economy	Managing Director	5
9	Disposal company	Recycling & waste management	Managing Director Recycling Company, Head of the Mineral Raw Materials Division (Disposal Company), Site manager of a landfill site; Managing Director for digital platform for waste disposal (wholly owned subsidiary by the above company)	3.600
10	Craft business	Construction and carpentry company	Head of Commercial Department Building Construction—Purchasing & IT	200
11	Craft business	Craftsman's company for prefabricated timber houses	Purchaser	100
12	Craft business	Company for large-volume façade & roof construction	Authorized signatory; Head of Technology	50
13	Craft business	Company specializes in basement ceiling insulation in industrial construction	Managing Director	14
14	Craft business	Timber construction company and carpentry	Managing Director	15
15	Retailer & Manufacturer	Facade insulation systems, facade plasters & paints, screeds, concretes & interior paints	Head of Product Management; Board member of the Thermal Insulation Systems Quality Group	4.900

Table 3 (continued)

IP	Company	Focus area	Position of interviewee(s)	Number of employees
16	Retailer & Manufacturer	Plaster systems, insulation solutions, refurbishment and renovation products, concrete, screeds and modern coatings	Sales Manager Carinthia / East Tyrol	1.000
17	Retailer & Manufacturer	Paints, plasters, external thermal insulation composite systems (ETICS), varnishes, concrete protection, adhesives for floor-wall-ceiling; glues, varnishes, glazes, stains, abrasives, floor coatings	Regional Sales Manager	707
18	Chamber of Commerce	Section: energy-efficient and sustainable construction and living	Spokesperson	n/a
19	Public Business Support Agency	Business agency connecting economy, politics & innovation in construction	Cluster Manager	n/a
20	Federal state representative	Participated in a workshop on Alpine Construction (shifting towards circular economy), European Alpine Strategy	15 workshop participants in the field of education, politics, economy	n/a

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Data availability The data supporting the findings of this study were collected by the authors. Due to confidentiality and ethical restrictions, these data are not publicly available. However, the dataset can be obtained from the authors upon reasonable request, provided that appropriate data protection requirements are met.

Declarations

Conflict of interest There is no conflict of interest.

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