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Corresponding author:
Arseni Kotov
arseni.kotov@taltech.ee

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Rethinking sustainability strategy in Estonian wood manufacturing firms

Arseni Kotov, Susanne Durst and Wolfgang Dieter Gerstlberger

Department of Business Administration, School of Business and Governance, Tallinn University of Technology, Akadeemia tee 3, 12616 Tallinn, Estonia

ABSTRACT

Sustainability-oriented innovation (SOI) is an increasingly important means for manufacturing firms to address environmental and social challenges while securing economic returns. Manufacturers exposed to similar sustainability pressures respond to them in strategically different ways. In this study, we examine this variation through the lens of behavioral strategy, focusing on the cognitive foundations of strategic reasoning about SOI. More specifically, we ask what mental representations underlie decision-makers' reasoning about SOI, how these are updated, and how they are associated with patterns of strategic search. Drawing on a qualitative analysis of interview data from export-oriented wood manufacturing firms in Estonia, we identify three recurring representations of sustainability: inherent and operationally settled, externally prescribed, and evaluatively unsettled. In turn, these representations are translated into judgments about specific alternatives through three evaluative filters: definition, relevance, and feasibility. As new pressures arrive, they typically reinforce the criteria already in use rather than alter the representations themselves, so firms' search for new options remains incremental. This study operationalizes insights from behavioral strategy for SOI, locating the source of its incrementalism less in what firms attend to but in the evaluative criteria through which decision-makers judge possible responses.

1. Introduction

Sustainability challenges can be reframed as a source of innovation (Hansen et al. 2009). Sustainability-oriented innovation (SOI) integrates environmental and social aspects at the level of products, processes, and organizations (Klewitz and Hansen 2014). Yet many opportunities for SOI lie beyond dominant ways of thinking (Gavetti 2012; Adams et al. 2016), and its uptake remains limited in manufacturing (Markard et al. 2020; Harsanto et al. 2024). This constrains the radical changes that sustainable development requires (Kennedy et al. 2017).

Previous research has addressed this problem along several lines of inquiry. Work on barriers to radical innovation suggests that restrictive mindsets foster resistance to change and limit the willingness to take risks (Sandberg and Aarikka-Stenroos 2014). A closely related strand of literature locates the difficulty in cognition itself. Hansen et al. (2022) show that sustainability-oriented exploration becomes fragile when exploitative routines and cognitive representations spill over into exploratory spaces. Matoh et al. (2024) find that cognitive frames shape how unfamiliar circular business models are understood and which elements become central in their design. Hartung-Geyer et al. (2026) similarly demonstrate that decision-makers' mental models shape sustainability-oriented opportunity recognition. Taken together, these studies indicate that cognitive structures matter for SOI. What remains less well specified, however, is how these structures are stabilized or updated and how they are associated with particular patterns of strategic search for sustainability responses.

We address this issue by examining the behavioral foundations of strategic reasoning about SOI. In line with behavioral strategy research (Powell et al. 2011), strategic reasoning in this study refers to how decision-makers interpret sustainability-related problems, consider alternatives, and evaluate responses. From a behavioral strategy perspective, decision-makers' search and evaluation depend on the mental representations through which they interpret the firm's environment (Gavetti and Levinthal 2000; Csaszar and Levinthal 2016). This is especially important in sustainability contexts, where firms confront uncertainty, complexity, and long time horizons (Afeltra et al. 2023; Taneja et al. 2023), rendering decision-making particularly sensitive to the cognitive constraints emphasized in behavioral strategy (Simon 1947; Powell et al. 2011). Because decision-makers are bounded in their rationality and rely on established evaluative frameworks (Cyert and March 1963; Eisenhardt and Zbaracki 1992), they may interpret novel sustainability challenges

through familiar categories and criteria, thereby narrowing the range of alternatives considered (Csaszar and Levinthal 2016). When such representations remain stable, decision-makers are more likely to search locally and rely on familiar solution patterns, thus reinforcing incremental change (Gavetti 2012). By contrast, changes in representations can expand the range of perceived alternatives and alter how novel challenges are interpreted, opening up possibilities for departure from established trajectories (Raffaelli et al. 2019).

This perspective directs attention to both the content of sustainability-related representations and the processes through which they are stabilized or updated, thereby clarifying how strategic alternatives enter consideration and are evaluated (Csaszar and Levinthal 2016; Becker et al. 2026). Whereas Küttim et al. (2024) identify efficiency, compliance, governance, and market access as motivations for sustainability engagement in the Estonian context, this study reads them as indicators of distinct representations of what sustainability means, what counts as an appropriate response, and which evaluative criteria guide reasoning about SOI. This shift in analytical lens matters because motivations explain why firms act, whereas representations explain how decision-makers frame the problem and evaluate possible responses. Understanding the latter is necessary for explaining why SOI remains incremental even when motivations to act are present. Doing so makes it possible to investigate how different representations are associated with different patterns of strategic search, and whether updating tends to expand the range of perceived alternatives or instead refine evaluative criteria within an existing frame. Accordingly, this paper asks: What sustainability-related representations underlie decision-makers' strategic reasoning about SOI? How are these representations updated? What patterns of strategic search are associated with them?

To address these research questions, we analyze interview transcripts as secondary data from export-oriented wood manufacturing firms in Estonia. The setting is analytically relevant for three reasons. First, wood manufacturing accounts for a substantial share of global industrial activity (Dalalah et al. 2022), making the sector consequential for sustainability transitions. If SOI remains incremental in this sector, the implications extend beyond the focal industry to broader efforts to transform manufacturing systems. Second, the industry is often regarded as inherently green because it relies on renewable resources, yet it involves energy-intensive production processes and faces scrutiny regarding waste, certification, and supply chains (Iritani et al. 2015; De Vass et al. 2023). This tension makes sustainability open to competing interpretations and, in turn, brings decision-makers' representations more clearly into view: it reveals whether sustainability is framed as already achieved, as a matter of compliance, or as a prompt for broader innovation search. Third, in Estonia, sustainability requirements are shaped largely by EU legislation (Ministry of Climate of the Republic of Estonia 2025) and by the country's integration into global trade, making the external cues that inform decision-makers' reasoning relatively traceable. The traceability of these cues allows us to examine how they are translated into decision-makers' representations of what sustainability entails and which responses are regarded as relevant.

This study makes two contributions. Theoretically, it identifies recurring sustainability-related mental representations among decision-makers in Estonian wood manufacturing firms and offers exploratory evidence on how these representations are associated with distinct patterns of strategic search. The analysis suggests that representational updating in this context is predominantly externally cued and tends to refine evaluative criteria within the frame already in use, pointing to a reinforcing dynamic in which external feedback may reproduce incremental search. Because these patterns are grounded in the specific conditions of Estonian wood manufacturing, where firms operate as export-oriented suppliers and where wood can be framed as inherently sustainable, their transfer to other sectors and settings remains a question for further research. Managerially, the findings suggest that intensifying external pressures alone may be insufficient to widen the range of sustainability responses firms consider, because such pressures are filtered through existing understandings of what sustainability is and what counts as a worthwhile response. Expanding the range of perceived alternatives may require managers first to diagnose how sustainability is being defined and evaluated inside the firm.

2. Literature

2.1. Sustainability-oriented innovation as strategic search

As ecological challenges intensify (Richardson et al. 2023), firms face growing pressure to incorporate environmental and social considerations into strategy (Afeltra et al. 2023; Trizotto et al. 2024). SOI is defined as "intentional changes to an organization's philosophy and values, as well as to its products, processes or practices, to serve the specific purpose of creating and realizing social and environmental value in addition to economic returns" (Adams et al. 2016, p. 181). Prior work conceptualizes SOI as a process unfolding along a continuum from incremental improvements to more radical forms of innovation (Klewitz and Hansen 2014), where radical innovations "are high in novelty and aim for significantly improved sustainability performance of systems" (Kennedy et al. 2017, p. 713).

SOI can therefore be understood as a strategic search problem (Csaszar and Levinthal 2016), in which firms identify and evaluate alternatives under uncertainty. What varies across firms is not only whether they engage in such search, but how broadly they define the set of alternatives perceived as viable (Klewitz and Hansen 2014; Adams et al. 2016).

SOI has been linked to strategic alignment around environmental objectives (Iñigo and Albareda 2016), competitive advantage (Hermundsdottir and Aspelund 2021), and economic performance (Taneja et al. 2023). Realizing these benefits is difficult, however, as sustainability-related decisions involve long time horizons and complex interdependencies across environmental, social, and economic systems (Korteling et al. 2023; Palmucci and Ferraris 2023). Consistent with these difficulties, most manufacturing firms

remain focused on operational optimization, regulatory compliance, and waste reduction rather than deeper reconfiguration of products, processes, or business models (Harsanto et al. 2024). What distinguishes firms is therefore less whether they innovate for sustainability than how they search for and evaluate alternatives.

2.2. Mental representations as cognitive filters for SOI

While SOI research has examined macro and meso levels, the individual level remains relatively underexplored (Sawe et al. 2021). Decision-makers are constrained by cognitive boundaries when setting strategic priorities (Nadkarni and Barr 2008), which may lead them to overlook critical information and alternative courses of action (Barnett 2008). Strategic search is therefore not a direct response to objective conditions but depends on how decision-makers frame problems, allocate attention, and evaluate alternatives (Cristofaro et al. 2022).

Behavioral strategy provides a useful lens for understanding these processes by incorporating realistic assumptions about cognition and decision-making into strategy research (Powell et al. 2011). Central to this perspective is the concept of mental representations, defined as "a model of reality held in the mind of an individual, who can use this representation to generate predictions about reality" (Csaszar and Levinthal 2016, p. 2031). These representations function as lenses that shape attention and constrain strategic search (Gavetti and Levinthal 2000). Related constructs such as schemas, mental models, and cognitive frames overlap in this role, even if they differ in emphasis (Becker et al. 2025).

Csaszar and Levinthal (2016) argue that strategizing involves not only identifying alternative actions but also selecting the dimensions along which they are evaluated. Because these dimensions depend on how situations are interpreted, mental representations shape both the alternatives considered and the criteria used to assess them. In the context of SOI, this raises a concrete question: What form do these evaluative criteria take in practice, and how do they translate a general understanding of sustainability into judgments about specific innovation alternatives?

2.3. Representational updating and evaluative criteria

This directs attention to representational updating: when and how the representations guiding evaluation remain stable or change. Becker et al. (2025) show that representations can be revised through learning, reframing, and exposure to new interpretive cues. Similarly, McKenzie et al. (2009) argue that decision-makers rely on established frames in ambiguous situations, although certain cognitive capacities can keep framing open and enable engagement with contradictory demands. Such shifts can broaden the range of alternatives considered and reshape how they are evaluated. Martins et al. (2015) further show that schemas can be changed proactively through generative processes that reorganize cognitive content. Csaszar and Levinthal (2016) treat the question of what triggers representational change as an empirical and theoretical issue rather than an assumption.

Applied to SOI, this leads to three questions: What sustainability-related representations do decision-makers hold? How are these representations maintained or revised under external pressure? What patterns of strategic search are associated with them? Addressing these questions helps explain why firms rely on incremental responses and under what conditions they move beyond them.

3. Methodology

3.1. Research design and data

The study adopts a qualitative research design (Silverman 2020) based on secondary interview data, namely transcripts originally collected for research projects commissioned by the Estonian Ministry of Economic Affairs and Communications on exporters' motivations for sustainable practices in wood and metal industries (Gerstlberger et al. 2023a, 2023b). These transcripts were previously analyzed in Küttim et al. (2024), who developed a typology of three managerial mindsets based on motivational patterns, and Kotov (2024), who examined factors shaping managerial attention toward circular economy practices in the metal industry. The present study addresses different research questions, applying a behavioral strategy perspective to examine how decision-makers' mental representations shape strategic reasoning about SOI. In total, 10 sessions were conducted in March 2023, including both individual and focus group interviews. Sessions lasted 75 to 90 minutes and were conducted predominantly in Estonian, with two sessions in English. The interview guide covered company profiles, sustainability activities and motivations, resource efficiency, technological innovation, supply chain partnerships, certifications, and the regulatory environment.

Nineteen companies participated, most medium-sized (average 183 employees; range 36 to 558) and operating for 24 years on average. Interviewees were primarily CEOs and managers responsible for operations, production, sustainability, or quality management. This composition fits the research questions, as it captures decision-makers with strategic authority over sustainability-related investments. These are the actors who routinely translate external cues into firm-level action, the level at which representations and evaluative criteria are likely to operate.

The transcripts are suitable for addressing the research questions because participants describe not only what their firms do in the name of sustainability, but also how they understand sustainability, which external cues they consider relevant, and which responses they pursue. This makes it possible to infer recurring representations, the cues through which they appear to be stabilized or revised, and the patterns of strategic search associated with them. At the same time, because the data are cross-sectional and were not collected specifically to elicit cognitive mechanisms, they do not allow direct observation of representational change over time or support strong causal claims about how alternative representations might have produced different patterns of search.

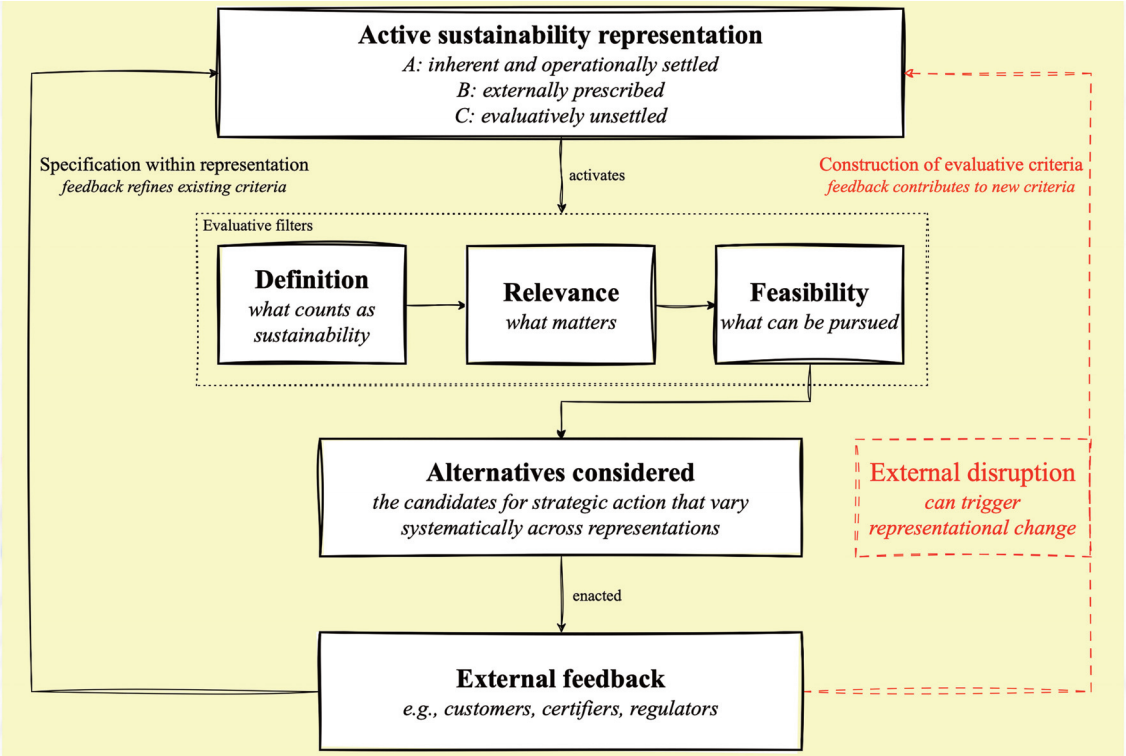


Fig. 1. How sustainability-related representations shape strategic search.

3.2. Analysis

The analysis followed an inductive coding approach informed by the Gioia methodology (Gioia et al. 2013) and adapted for secondary data (Heaton 2008). The first author conducted all coding in MAXQDA (Release 26.2.0). Estonian-language segments used in the analysis were translated into English by the first author, with key analytical quotations cross-checked against the original transcripts. Participants were identified by codes (I-1 to I-22) because the original study's consent terms did not permit naming participants or their firms.

Three iterative coding passes were conducted, each focused on a distinct analytical layer. The first pass identified how sustainability was defined and which evaluative criteria were applied. The second pass identified updating: how participants interpreted external requirements and translated them into feasibility judgments. The third pass traced which sustainability-related alternatives participants described pursuing and what fell outside their consideration. First-order concepts were developed close to participants' own language and subsequently grouped into second-order themes and aggregate dimensions, producing the data structure presented in Fig. S1 (Supplementary material). Because coding was conducted by a single coder on secondary data not originally collected to examine cognitive constructs, saturation and intercoder reliability criteria are of limited applicability. Analytical credibility was pursued through iterative comparison and cross-checking of quotations.

4. Results

The analysis develops an account that links how decision-makers understand sustainability to the alternatives they treat as serious candidates for action. The account has three components: a representation of what sustainability is taken to mean, the evaluative filters it activates, and an updating pattern through which external feedback reinforces or refines those filters. Three filters, definition, relevance, and feasibility, were identified inductively as the recurring moves through which participants reason from their understanding of sustainability to judgments about specific alternatives. They were derived from the data, not imposed from prior theory. Figure 1 shows this account in general form. The composition of the alternatives considered varies with the active representation, as the next subsection shows.

The analysis further identifies three sustainability-related representations in this setting: sustainability as inherent and operationally settled (Representation A), sustainability as externally prescribed (Representation B), and as an evaluatively unsettled question (Representation C). The first subsection describes how representations activate evaluative criteria and how the three filters operate. The second shows how the same external pressures produce different alternatives across representations. The third traces the updating pattern.

4.1. How representations activate evaluative criteria

Participants moved from general statements about sustainability to specific judgments about particular alternatives through a consistent sequence. They first established what counted as a sustainability issue for their firm (definition), then sorted which issues were consequential enough to act on (relevance), and finally assessed whether specific responses could be pursued under technical, economic, organizational, market, or legitimacy criteria (feasibility).

The definition filter sets the boundary of what counts. Across the data, decision-makers typically stated that their industry already qualified as sustainable. For instance, I-1

noted that *the wood industry overall is a very green industry … the product itself is green to the core*. I-3 extended this to production processes: *the wood sector is probably the one where nothing is left over*. I-20 similarly argued that *a large part of the Estonian wood and forest industry is … already very advanced anyway*. I-9 emphasized the same point: *we have a very green profile because we are not using oil or gas*.

The relevance filter determines which issues are treated as consequential. I-13 described a sequencing logic in which *greenness becomes a topic only after you have qualified through two or three earlier rounds on other grounds*. I-7 noted that *no one pays you more for being green*, framing sustainability as a condition for market access rather than a source of premium. I-12 generalized this pattern, observing that *being green is increasingly becoming a hygiene factor*. By contrast, I-15 grounded relevance in personal conviction: *honestly, this is our own wish, our own will*.

The feasibility filter evaluates whether specific responses can be pursued. I-20 weighed a choice between green energy and a wood scanner, judging the scanner to offer measurable value while green energy seemed merely apparent, failing on both economic and legitimacy grounds. I-2 explained that laminated timber had been considered but not adopted due to unresolved fire-safety issues, a technical constraint. I-15 described pursuing eco-leather and water-based adhesives despite the absence of a market premium, with legitimacy outweighing commercial considerations. As I-20 put it: *we have it on the management table whether to buy 100% green energy or invest in a proper scanner … the direction is towards technology rather, for now*.

Taken together, these filters show how representations shape strategic search. Representations provide the frame, while the filters translate that frame into evaluative criteria. As a result, the same alternatives may be accepted or rejected depending on which representation is active.

4.2. Same pressures, different alternatives considered

Across the sample, firms face similar external conditions, including certification demands, EU regulations, and the 2022 energy crisis, yet the alternatives they consider diverge.

In firms operating within the inherent and operationally settled representation, the alternatives considered concentrate on residue valorization, internal energy generation from wood waste, material yield improvements, and technology investments with measurable payback. As I-1 noted: *if you think about production, the footprint is still very small when we compare it to the packaging industry; these are on completely different scales*. The relevance filter screens out footprint-reduction targets that are interpreted as already achieved through the sector's raw material base.

In firms operating within the externally prescribed representation, the alternatives considered center on certifications required for market access, reports prepared for customers (environmental product declarations, carbon footprints, and environmental, social and governance (ESG) disclosures), and the local implementation of targets set by the parent company. I-14 explained that certification requirements specify *which paints, which putties we may use; the entire chemical composition must be calculated, reported, controlled*. I-21 described a similar logic under group ownership: *because we belong to the group … we have quite strict targets*. In both cases, the alternatives considered are defined by external prescriptions that specify where action takes place.

In firms operating within the evaluatively unsettled representation, the alternatives considered are more open and include actions that the other two representations would screen out. I-15 described recyclable sofa components, eco-leather from textile waste, and water-based adhesives developed in the absence of customer demand: *honestly, this is our own wish, our own will*. I-22 described plans for an external green audit and questioned whether their current use of residues qualifies as circular. Both cases illustrate that representational openness allows firms to question and extend their own definitions of sustainability.

This divergence supports the claim that external pressures are not processed directly but through filters that depend on the active representation, which determines what is treated as relevant and feasible. The contrast between I-21 and I-22 illustrates this most clearly. Both discussed renewable-energy certificates in the same focus group session. I-21 treated centralized certificate purchases as a legitimate means of meeting corporate targets. I-22 rejected the same instrument with explicit definitional reasoning: *we do not want to appear green … our electricity is still entirely fossil*. The instrument is identical; what differs is the representation through which it is evaluated.

4.3. Updating as specification within the active representation

External feedback reaches firms continuously but is most often absorbed into the representation already in place, specifying or intensifying existing evaluative criteria rather than prompting representational change. Because the data are cross-sectional, this pattern is inferred from retrospective accounts rather than directly observed over time. The illustrations that follow should therefore be read as patterns that fit the proposed account rather than as direct evidence of change unfolding.

I-1 described years of investment in data infrastructure and supply chain reporting: *where we were two years ago is not comparable with where we are today*. The investments are driven by efficiency, the same criterion the firm has applied for years. Recent activity has sharpened that criterion rather than introduced a new one. I-7 described a similar trajectory for energy. Where energy use had been marginal *a couple of years ago*, the 2022 energy crisis prompted near-daily monitoring. The crisis made an existing concern operationally sharper, not a strategically new one.

I-22 and I-15 illustrated updating under unsettled representations. I-22 explained the firm's refusal to buy green-energy certificates: *we do not want to appear green … our electricity is still entirely fossil*. For I-22, what counts as genuine greenness is still being worked out, and refusing the certificate is part of that ongoing question. I-15's firm sits in a similar position. It pursues new developments ahead of customer demand because its criteria for what counts as a

worthwhile sustainability investment, such as authenticity and long-term fit, are still taking shape. In these cases, external feedback helps build the criteria rather than refine them.

Across the data, external feedback rarely alters representations directly. Instead, it updates the criteria through which they operate. Feedback enters at the feasibility stage, where it is assessed against existing criteria and either confirms or intensifies them. Representations persist because their criteria continue to function. As a result, strategic search remains incremental as long as these criteria are reinforced. Broader strategic search is observed primarily where representations remain unsettled.

5. Discussion

This study examined what sustainability-related representations shape decision-makers' strategic reasoning about SOI, how these are updated, and how they influence patterns of strategic search. The findings identify three recurring representations, show that external feedback most often refines criteria within the active representation rather than replacing it, and demonstrate that firms facing similar sustainability pressures nonetheless consider different alternatives. Together, these findings shift attention from whether firms engage in sustainability to how their search for sustainability responses is cognitively structured.

Strategic search for sustainability responses is not determined by external pressures alone but by the representational filters through which they are interpreted. The firms in this study were not inactive on sustainability. They held certifications, valorized residues, monitored energy use, and in some cases pursued innovation in products and materials. The central variation therefore lies not in whether firms respond, but in how they define what counts as a sustainability issue, what they treat as consequential, and what they judge feasible. By specifying these processes as definition, relevance, and feasibility filters, the study shows how representations structure search before action is taken. In doing so, it operationalizes Csaszar and Levinthal's (2016) argument that strategy operates on representations as much as on actions and provides a more concrete account of attention-based search (Gavetti 2012).

Firms exposed to similar external conditions do not converge on the same alternatives. Despite facing common certification requirements, regulations, and customer expectations, firms generated distinct sets of serious candidates for action. In the inherent and operationally settled representation, strategic search concentrates on residue valorization, yield improvements, internal energy generation, and technology investments with visible payback. In the externally prescribed representation, strategic search is organized around certification demands, reports prepared for customers, and the implementation of targets set by the parent company. In the evaluatively unsettled representation, strategic search extends to exploratory alternatives such as recyclable components, alternative materials, audits, and ongoing questioning of what counts as sustainability. This adds to prior work on cognitive heterogeneity in sustainability innovation (Hansen et al. 2022; Matoh et al. 2024; Hartung-Geyer et al. 2025) by showing that the relevant heterogeneity lies not only in what actors think, but in the evaluative criteria through which they sort possible responses.

The three representations identified in this study cut across dominant sustainability typologies rather than fitting within them. Prior research typically conceptualizes SOI as a progression from reactive to proactive approaches or from operational optimization to more transformative forms (Klewitz and Hansen 2014; Adams et al. 2016), or emphasizes the need to manage tensions between competing sustainability dimensions (Hahn et al. 2014). While these perspectives capture variation in the extent of sustainability engagement, they do not explain why firms facing similar pressures define and evaluate sustainability differently. The representations identified here operate at comparable levels of engagement yet rely on distinct evaluative criteria: sustainability is treated as inherent, as externally prescribed, or as open to reinterpretation. The contribution is therefore to shift attention from how far firms progress toward sustainability to how sustainability is cognitively structured in decision-making, and how this shapes the range of alternatives considered.

The findings also speak to how representational updating operates in practice. Existing work has emphasized the importance of updating but has said less about its effects (Csaszar and Levinthal 2016; Becker et al. 2025). The findings suggest that external feedback rarely alters the active representation. Instead, it is processed through the evaluative criteria already in use, which are refined or intensified. Firms are continuously exposed to customer demands, certification requirements, and crisis conditions, yet the outcome is typically greater activity within the same frame rather than broader strategic search beyond it. Incrementalism persists not because firms ignore feedback, but because feedback is translated through criteria that it helps confirm. Where efficiency dominates, technology investments remain central; where external prescription dominates, certifications and reporting define the alternatives considered. This specifies how representations matter for SOI: feedback stabilizes the evaluative criteria they activate rather than transforms the representations themselves. Organizational identity research points in a similar direction, treating identity as both stable in appearance and responsive to stakeholder interaction (Gioia et al. 2000). The present study contributes to this logic by considering the evaluative criteria through which sustainability-related alternatives are assessed.

These findings qualify accounts that emphasize external interaction as the primary driver of broader strategic search for sustainability responses. Prior work has highlighted sustained interaction with customers, certifiers, and regulators as a key route to expanding search (Klewitz and Hansen 2014; Adams et al. 2016). The firms in this study interact extensively with such actors, yet the dominant outcome is refinement within the active representation rather than expansion into broader forms of SOI. External interaction is therefore necessary but not sufficient, because its effects

depend on how it is cognitively processed. This is consistent with Hansen et al.'s (2022) account of cognitive frames from core business migrating into exploratory spaces and suggests that a similar dynamic may operate across firms within a sector. The wood manufacturing context may make this particularly visible: the renewable raw material positions the inherent and operationally settled representation as the path of least resistance, and external feedback follows familiar patterns.

Broader strategic search appears not as the general consequence of increasing pressure but as a conditional outcome associated with representational openness. The findings suggest that expansion occurs primarily where the representation remains evaluatively unsettled, so that external cues feed into criteria that are still being worked out. Once the representation settles, the dominant pattern becomes refinement within it. Such openness is sometimes associated with moments of external disruption, as crisis conditions can unsettle existing criteria and create space for new ones to emerge. This is consistent with Martins et al.'s (2015) argument that schemas can change under specific generative conditions and suggests that, in the SOI context, one such condition is that the representation remains open to revision.

An alternative explanation is that incrementalism reflects sectoral maturity rather than cognitive filtering. Estonian wood manufacturing firms may already be close to the practical frontier of SOI under current technological, regulatory, and market conditions. However, this account does not explain the variation observed here. Firms facing similar conditions considered different alternatives, and the same alternatives were evaluated differently depending on the criteria in use. The point is therefore not to deny sectoral constraints, but to show that they are cognitively mediated: the sector bounds the space of possibilities, and representations sort within that space.

6. Conclusion, limitations, and future research

Firms facing similar sustainability pressures do not differ only in how much they respond. They consider different alternatives because sustainability is represented differently and filtered through distinct evaluative criteria. In the Estonian wood manufacturing context, external feedback most often refines the active frame rather than broadens it, helping explain why firms that pursue sustainability still display incremental patterns of strategic search. By tracing how representations activate evaluative filters and how feedback specifies criteria within the active frame, the paper offers a behavioral strategy account of how the strategic search for sustainability responses is cognitively structured under continuous pressure.

The findings derive from wood manufacturing firms operating under sustained market and regulatory pressures. The sector's reliance on renewable raw materials makes the inherent and operationally settled representation easy to adopt, while export dependence makes externally prescribed sustainability difficult to ignore. The account may travel to other settings where firms face perpetual sustainability demands and remain active on SOI, although the specific representational content will be context-dependent.

Three limitations should be noted. First, the data are cross-sectional, so the proposed account is inferred from what decision-makers reported rather than traced longitudinally. Second, the study relies on secondary qualitative data collected for a different purpose; the transcripts are rich enough to recover representational content, evaluative criteria, and search patterns, but do not support fine-grained claims about individual cognitive dynamics. Third, the empirical setting is narrow in industrial and geographic terms, which limits claims about the specific representations likely to appear in other sectors or national contexts. Future research could trace these dynamics longitudinally, examine their applicability across sectors, and investigate how representational openness emerges and gives way to settled criteria over time.

Data availability statement

The interview transcripts analyzed in this study cannot be shared openly because the original consent terms do not permit naming participants or their firms. Anonymized illustrative quotations supporting the analysis are presented in the results section. The data structure, including first-order concepts, second-order themes, and aggregate dimensions, is provided as supplementary material.

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Supplementary material

Figure S1, available at https://doi.org/10.3176/proc.2026.3.S07, shows the data structure of first-order concepts, second-order themes, and aggregate dimensions for the three sustainability representations.

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Jätkusuutlikkuse strateegia ümbermõtestamine Eesti puidutööstusettevõtetes

Arseni Kotov, Susanne Durst ja Wolfgang Dieter Gerstlberger

Jätkusuutlikkusele orienteeritud innovatsioon on tootmissektoris üha olulisem, ent sarnase jätkusuutlikkussurve all tegutsevad ettevõtted käituvad sageli erinevalt. Uurime, kuidas otsustajate kujutluspildid sellest, mida jätkusuutlikkus tähendab, suunavad nende strateegilist mõtteviisi ning kuidas need kujutluspildid muutuvad ja mõjutavad seda, milliseid lahendusi otsitakse. Töö tugineb Eesti puidutööstuse ekspordiettevõtetes läbi viidud intervjuudele.

Analüüs toob välja kolm korduvat viisi, kuidas otsustajad jätkusuutlikkust mõistavad: jätkusuutlikkus kui valdkonna olemusest tulenev ja tegevuses juba lahendatud küsimus, jätkusuutlikkus kui väljast ette antud nõue ning jätkusuutlikkus kui veel lahtine, otsustaja enda jaoks kujunev küsimus. Kolme hindamissammu kaudu, milleks on määratlemine, olulisuse hindamine ja teostatavuse kaalumine, jõuavad otsustajad nendelt üldistelt arusaamadelt konkreetsete valikuteni.

Tulemused näitavad, et sarnase välise surve all teevad ettevõtted erinevaid valikuid, sest nad mõtestavad seda survet erinevate kriteeriumide kaudu. Väline tagasiside ei muuda enamasti kujutluspilti, vaid täpsustab kriteeriume selle sees, mistõttu jäävad lahenduste otsingud senistesse raamidesse.

Uuring pakub empiiriliselt põhjendatud käsitlust sellest, kuidas jätkusuutlikkuse üle arutlemine on Eesti puidutööstuses kognitiivselt struktureeritud, ning aitab mõista, miks suurenev väline surve ei pruugi laiendada nende valikute hulka, mida ettevõtted tõsiselt strateegilise sammuna kaaluvad.