

Collective Market Shaping in Business-to-Business Ecosystems for Zero-Emission Construction

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Abstract

This paper examines how multiple actors in three Swiss zero-emission construction site pilots engage in market shaping practices and framing processes that (re)configure coordination. Using an abductive multiple-case design, we find three market shaping practice bundles – access and sharing, assurance and data governance, as well as early buyer–supplier alignment – and identify how they combine into two distinct market shaping configurations: an incumbent–servitisation configuration centred on contractual control and compliance, and a platform–ecosystem configuration based on distributed access, shared digital reporting and early co-planning. The study contributes a meso-level explanation of collective market shaping in procurement-driven sustainability transitions, highlighting how generative and retentive effects emerge simultaneously and how governance arrangements shape alternative transition pathways.

Keywords

sustainability transitions, inter-organisational coordination, framing

Track

business-to-business marketing & supply chain management

1. Introduction

Decarbonising construction on-site operations is not a simple substitution of diesel with electric machinery. It requires re-organising how work is scheduled, powered and verified, how assets are accessed and paid for, and how responsibilities are allocated across temporary project partnerships. In an industry with extremely tight margins, even small coordination failures around who may use which machines when, how utilisation is evidenced and who carries liability can offset technological gains. These challenges point to a deeper issue: the market structures and coordination logics of construction themselves are in transition. Decarbonisation pressures expose misalignments between public procurement rules, asset ownership models and emerging digital assurance systems. Achieving zero-emission construction therefore depends not only on new technologies but on how firms and public actors collectively shape markets, i.e. how they enact generative and retentive market shaping moves that open or stabilise the rules, roles and representations that govern exchange. Existing research offers partial answers. Sustainability transitions scholars conceptualise how socio-technical systems change under decarbonisation and related policy pressures, yet tend to under-specify the concrete market coordination through which interdependent organisations negotiate responsibilities, risks and value flows (Geels, 2002; Köhler et al., 2019). Conversely, market shaping research provides rich accounts of how firms purposefully modify markets (Pels et al., 2023), but seldom anchors these mechanisms in the regulatory, infrastructural and procurement dynamics that characterise sustainability transitions. What remains missing is an integrated explanation of how collective market shaping unfolds in procurement-driven, project-based ecosystems where public and private actors jointly experiment with low-carbon solutions. Against this backdrop, we develop a meso-level account of collective market shaping in emerging zero-emission construction site (ZECS) ecosystems.

2. Analytical Framework

2.1 Market shaping as a collective, multi-actor process

We adopt a collective market shaping view in which market change emerges from the coordinated and contested “market work” of interdependent organisations with asymmetric resources and divergent goals (Baker & Nenonen, 2020; 2025). This perspective is particularly relevant in sustainability transitions, where incumbents, public authorities and innovators simultaneously attempt to redefine legitimate exchange under decarbonisation and

accountability pressures. We distinguish three interrelated dimensions through which markets take form. First, *market structures*: the actor configurations, roles and relationships that constitute the field, shaped by regulatory, infrastructural and industrial conditions (Baker & Nenonen, 2020). Second, *market practices*: the day-to-day activities through which actors coordinate, transact and enact the market (Kjellberg & Helgesson, 2006). Third, *market representations*: the shared meanings and narratives through which actors define problems, propose solutions and justify action – captured through framing processes (Benford & Snow, 2000; Kaplan, 2008; Koch & Ulver, 2022). Market shaping unfolds through the recursive interplay of these dimensions: actors use practices and representations to influence structures, which in turn condition future coordination possibilities (Pels et al., 2023).

2.2 Market shaping practices across phases

Flaig et al. (2021) conceptualise market shaping as a multi-phase process of infusion, formation and retention. We use this phased understanding as a temporal backdrop to highlight how multiple market shaping processes co-exist and overlap, rather than to reconstruct full phase sequences in our cases. Building on this backdrop, we complement Flaig et al.'s (2021) phase conceptualisation with a directional distinction between generative and retentive market shaping effects that focuses on coordination outcomes: generative shaping opens coordination by introducing new roles, rules and linkages, whereas retentive shaping stabilises or narrows existing arrangements. Echoing distinctions between enabling and constraining forms of institutional work (Fligstein, 2002; Geels, 2018), we use these labels as analytic tags for the observed direction of coordination change.

Market shaping practices are key elements of market coordination and link micro-level activities to meso-level market reconfigurations. This said, they reveal how actors create, alter or stabilise the rules and relationships that govern exchange and how directional (generative or retentive) effects become embedded in recurring coordination routines.

2.3 Market representations and framing contests

Market practices supply the material mechanisms of coordination, while market representations capture the symbolic and cognitive dimension of how markets are understood and justified (Pels et al., 2023). We conceptualise market representations as shared frames and narratives that define what problems are seen as salient, which solutions appear viable and which actor roles are considered legitimate (Koch & Ulver, 2022). Framing, in turn, denotes the situated work through which actors construct, maintain and challenge these

representations. In this sense, framing processes are the micro-dynamics by which market representations are enacted and transformed over time. Framing processes – diagnostic (problem definition), prognostic (solution design) and motivational (justification) – connect micro-interaction to meso-level coordination by linking concrete episodes of sensemaking to more general representational templates of the market (Benford & Snow, 2000; Kaplan, 2008). In contested transition fields, competing actors adopt divergent frames to legitimise alternative coordination logics (Koch & Ulver, 2022). We follow this line by treating ZECS as a framing arena in which actors struggle over market representations, e.g. whether zero-emission construction is framed as a compliance obligation, a competitive risk or a collaborative innovation platform. Frame alignment or misalignment influence whether shaping efforts become mutually reinforcing or diluting, and whether coordination tends towards opening or stabilising market arrangements (Mehtälä et al., 2025). Taken together, these insights highlight how market structures, practices and representations interact in shaping coordination, but they do not yet specify how these elements combine into more durable patterns at the market level.

2.4 From market structures, practices and representations to market shaping configurations

We thus conceptualise ZECS ecosystems as multi-actor market shaping arenas in which regulatory and infrastructural conditions intersect with practice-based coordination and framing-based legitimisation. In the pilots we study, these dynamics do not yet amount to a fully stabilised market order. However, they generate emergent, ideal-typical combinations of practices and representations that mirror what prior research has described as market configurations, i.e. coherent patterns of coordination, framing and governance that structure how markets operate (e.g., Kjellberg & Helgesson, 2006; Geiger & Kjellberg, 2021; Nenonen & Storbacka, 2020). We use the term ‘*market shaping configurations*’ to highlight that these patterns arise from ongoing, collective market shaping activities rather than from mature or fully institutionalised arrangements. Based on this meso-level vantage point, we explore the following *research questions*: How do multiple actors in emerging zero-emission construction ecosystems engage in market shaping practices and framing processes that (re)configure inter-organisational coordination? How do recurring combinations of these practices and frames give rise to distinct market shaping configurations that are associated with different generative and retentive effects on coordination?

3. Methodology

We adopted a qualitative, abductive, multiple-case research design (Dubois & Gadde, 2002; Welch et al., 2019). ZECS in Switzerland provided a revelatory context (Siggelkow, 2007). We investigated three pilots in Lucerne, Zurich and Basel, each experimenting with electrified machinery, local charging infrastructure and digital monitoring. The pilots involved heterogeneous networks of public authorities, contractors, equipment providers, municipal energy utilities and technology firms, i.e. actors with different resources, goals and institutional mandates. This mix of experimental practices and established routines made otherwise taken-for-granted coordination mechanisms visible at the interface between emerging ZECS practices and existing construction arrangements. Sampling was purposive (Patton, 2002). Cases and respondents were chosen to capture variation in project type, governance form and actor role (public/private; established vs. innovative actors). Across all pilots, we triangulated 24 semi-structured interviews of 60–90 minutes length with multi-actor workshops, site observations, and documentary evidence (tender materials, policy briefs, internal reports, and regulatory documents). All data were imported into MAXQDA for systematic analysis.

Our abductive research process linked the review of research in servitisation, inter-organisational governance and public procurement with iterative coding of the market practices in the ZECS pilots. Rather than predefining categories, we treated these literatures as sensitising concepts and moved back and forth between emerging interpretations and empirical material. This systematic combining allowed us to progressively focus on recurrent inter-organisational coordination routines, which informed our coding.

In our coding approach, we applied template analysis (King, 2012; King & Brooks, 2017), starting from an initial template derived from the abductive focus on inter-organisational coordination mechanisms and iteratively refined it with additional subcodes. The unit of analysis was the inter-organisational coordination mechanism, i.e. the concrete activity or routine through which actors enacted core market shaping practices across organisational boundaries. To capture the interpretive dimension, we embedded framing functions (diagnostic, prognostic, motivational) as subcodes within each practice and coded the directional market shaping effect (generative vs. retentive) for each instance. As coding progressed, related coordination mechanisms were grouped into three higher-order bundles of market shaping practices. Cross-case matrices (practice x actor role x framing function x direction) were then used to identify recurring pattern combinations, which we clustered into two higher-order configurations. Negative-case analysis and peer debriefing enhanced

robustness (Miles et al., 2014). The emergent configurations were validated and refined in follow-up workshops with case participants.

4. Findings

Across cases, our analysis revealed three higher-order bundles of inter-organisational coordination routines that recurred across the ZECS pilots: (1) access and sharing, (2) assurance and data governance, and (3) early buyer–supplier alignment. These bundles reflect distinct ways in which actors organised participation boundaries, structured accountability and synchronised planning under transition pressures. While these bundles emerged empirically through iterative coding, our abductive analysis also showed how they connect to and are refined through prior research. Access and sharing practices relate to shifts from ownership to access-based models, the redistribution of utilisation risks and the organisation of shared resource use (Uлага & Reinartz, 2011; Brax et al., 2021; Kohtamäki et al., 2019). Assurance and data governance connect to mechanisms through which actors establish verifiable accountability, relying on combinations of contracts, relational norms and digital infrastructures to reduce verification costs and define rights to data and interoperability (Poppo & Zenger, 2002; Schmidt & Wagner, 2019; Kouhizadeh et al., 2021). Early buyer–supplier alignment mirrors work on pre-tender dialogue, supplier involvement and modular lot design, which links procurement processes to technological development and clarifies interfaces between public buyers and suppliers (Handfield et al., 1999; Holma et al., 2022; Flanckegård et al., 2021). Together, these bundles constitute the core market shaping practices through which actors negotiated and reconfigured coordination in emerging ZECS ecosystems. Across the pilots, we observed consistent patterns linking these practices to competing frames of zero-emission construction, i.e. alternative market representations, and to the direction of market shaping effects. In combination, they formed two recurrent market shaping configurations.

The first of these bundles concerned access and sharing arrangements, which became the most contested coordination arena across the pilots. Innovative actors such as technology start-ups, municipal energy utilities and SME contractors framed shared access generatively, as inclusion and collective learning. Their proposals centred on digital scheduling and pay-per-use, i.e. opening participation through rule-based sharing. Incumbent firms, by contrast, advanced retentive frames that prioritised reliability, liability and competitive insulation. The result was a clear divergence: under municipal orchestration, shared-use rules and booking

platforms opened access; where large contractors prevailed, access re-centralised into conventional service contracts. The same coordination challenge (how to access electrified machinery) thus yielded either generative widening or retentive recentralisation of the market.

The second practice bundle centred on assurance and data governance, where actors negotiated the boundaries of digital transparency and control. Assurance mechanisms translated new technological dependencies into verifiable rules. Innovative actors treated digital transparency (shared registries, auditable charging logs, distributed-ledger prototypes) as generative enablers of collaboration. Incumbent actors problematised data exchange as costly and risky, favouring retentive designs: contractor-controlled compliance portals and narrow interfaces. When public tenders mandated shared reporting standards, adoption converged, but for different reasons: challengers to open participation, incumbents to demonstrate compliance. Across cases, assurance functioned as a double-edged shaping lever: generative when shared standards reduced verification frictions, retentive when proprietary verification raised participation thresholds.

The third bundle focused on early buyer–supplier alignment, which proved decisive for translating experimentation into practice. Municipal clients introduced pre-tender dialogues, early design workshops and modular lot structures, reframing procurement from rule enforcement to collaboration under accountability. Diagnostic frames highlighted fragmented planning and rigid procedures as barriers; prognostic frames proposed joint interface clarification to synchronise energy supply, machine availability and tender specifications. Incumbents acknowledged efficiency gains yet resisted open-ended collaboration that could blur responsibilities or inflate transaction costs. Where formalised, alignment produced generative coupling across construction, energy and technology markets; where curtailed, it regressed to retentive proceduralism.

Integrating these three market practice bundles reveals two emergent market shaping configurations that repeatedly surfaced across the pilots. The first, incumbent–servitisation configuration, is led by established contractors and equipment-service incumbents: access is organised via centralised service bundles, assurance via contractor-controlled compliance systems, and early buyer–supplier alignment via procedural standardisation rather than co-design. Framing emphasises risk, liability control and efficiency, yielding retentive (stabilising) effects and slower diffusion beyond pilots. The second, platform–ecosystem configuration is driven by start-ups, municipalities and technology providers: access via consortium-based sharing and rule-based booking, assurance via shared data standards and digital registries, and early alignment through pre-tender co-specification and joint planning

boards. Framing stresses transparency, inclusion and climate responsibility, producing generative (opening) effects, contingent on credible digital governance and orchestration. We treat these configurations as ideal-typical patterns of governance and coordination in an emerging ZECS market, acknowledging that individual projects often exhibit hybrid features.

5. Discussion

Our first addition to the literature concerns how market shaping dynamics interact with sustainability pressures, highlighting the simultaneous presence of generative and retentive mechanisms. Flaig et al. (2021) conceptualise market shaping as a multi-phase process of infusion, formation and retention, while emphasising that these phases rarely unfold sequentially. Our analysis extends this perspective by showing how generative and retentive shaping unfolded simultaneously within the same emerging market arena in our cases. In our material, incumbent firms predominantly engaged in retentive activities that stabilised established coordination routines, whereas innovative actors experimented with more generative mechanisms that reconfigured access, assurance and alignment. These patterned differences highlight how market shaping is conditioned by the regulatory, infrastructural and accountability pressures characteristic of sustainability contexts. Rather than a linear progression from experimentation to stabilisation, the ZECS pilots suggest a recursive interplay between opening and closing moves: generative mechanisms introduce new roles and linkages, while retentive mechanisms delimit participation and reassert existing governance templates. Collective market shaping thus provides a meso-level explanation of how coordination evolves under sustainability pressures, specifying how competing actor coalitions negotiate and partially consolidate alternative market arrangements.

A second contribution relates to the governance-related configurations through which market shaping is enacted in zero-emission construction. The coexistence of retentive and generative dynamics illustrates how market shaping can be mediated through distinct governance arrangements. The first, an incumbent–servitisation configuration, centres on contractual control and compliance. Here, established construction firms collaborate with public clients to integrate emission-reduction requirements into procurement and service contracts. These actors shape the market defensively by extending existing standards and contractual obligations to new technologies. Such arrangements stabilise incumbent positions and reproduce established hierarchies of accountability, illustrating a predominantly retentive market shaping logic (Hietanen & Rokka, 2015; Nenonen & Storbacka, 2020). The second, a

platform–ecosystem configuration, is based on distributed access, digital assurance and early co-planning. Instead of governing through compliance alone, coordination occurs through shared data infrastructures and voluntary alignment of goals. This configuration is more strongly associated with generative shaping, as new actors experiment with collaborative governance and new value flows (Geiger & Kjellberg, 2021; Baker & Nenonen, 2020). It thus represents a more open, experimental mode of market shaping in an emerging field, but one that, in our cases, appeared to depend strongly on public facilitation and trust-building mechanisms. Together, these configurations suggest that market shaping in sustainability transitions is not a uniform process of diffusion or adaptation, but a plural and negotiated mode of coordination. Governance thereby emerges as a key medium through which competing transition pathways are articulated, institutionalised or contained.

A third insight concerns the tensions and complementarities between opening and stabilising logics in emerging markets. The coexistence of generative and retentive shaping in our cases points to structural and temporal tensions that go beyond simple conflicts of interest. Retentive logics provide predictability and legitimacy through formal contracts, compliance routines and established standards, but they constrain the generative potential of experimentation. Conversely, generative logics expand the space for innovation by enabling new combinations of data, actors and resources, yet they depend on fragile trust relations and still-limited institutional support. In this sense, markets in sustainability transitions may evolve less through the straightforward replacement of one logic by another than through their mutual adjustment over time (Fligstein, 2002; Geels, 2018). Our findings suggest that effective governance in zero-emission construction is likely to depend on balancing these logics: translating early experimentation into institutionalised routines without suppressing diversity and learning. This resonates with recent views of market shaping as an ongoing negotiation between change agents and stability-seeking actors (Geiger & Kjellberg, 2021; Nenonen & Storbacka, 2020). The ZECS pilots illustrate how such interdependencies can unfold: in our cases, platform-oriented initiatives often drew on incumbents' resources and legitimacy, while some incumbents began to experiment with platform-based coordination to maintain or redefine their role under emerging sustainability regimes. Rather than a linear diffusion of innovation, market shaping in this context appears as a recursive process of alignment and counter-alignment between actors situated in different governance modes and transition logics.

6. Conclusion

This study examined the transition towards zero-emission construction, showing how it is shaped through market structures, practices and representations. Our contribution is threefold. First, we advance market shaping research by specifying how collective, governance-oriented market shaping operates in procurement-driven sustainability transitions. Second, we show how three recurrent coordination practices link inter-organisational cooperation to changes in market rules and representations. Third, we identify two ideal-typical configurations, an incumbent–servitisation configuration and a platform–ecosystem configuration, as emerging trajectories of collective market evolution within the same transition field.

The findings have direct implications for practice and policy. Public buyers can accelerate zero-emission construction by institutionalising early collaboration formats that align planning across construction, energy and technology providers. Shared reporting and data standards can reduce verification costs while maintaining accountability, helping to balance openness with control. Intermediary orchestrators, such as municipal offices or industry associations, are essential for transferring learning across projects and stabilising emerging coordination routines. Finally, monitoring participation and exclusion is crucial to ensure that market development under decarbonisation remains both economically viable and socially inclusive. In sum, sustainability transitions hinge on how markets themselves are shaped and sometimes resisted. Understanding, steering and safeguarding this collective process offers a pathway towards more resilient, transparent and inclusive industrial ecosystems.

This study is limited by its focus on three Swiss pilot projects and the early stage of market development. Future research could extend these insights by tracing how generative and retentive dynamics evolve as markets mature, and by comparing governance configurations across sectors and countries.

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