

NOTES AND INSIGHTS

From low-hanging fruit to high-impact sustainability transformations: unpacking dynamics of intra- and interorganizational capability traps

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Abstract

Why are organizations and markets slow to transform toward sustainability despite the abundant well-recognized opportunities it provides? An important subset of the phenomena this question addresses involves decision-makers recognizing the existence of opportunities but failing to undertake ambitious, effective, sufficient, or timely action. Building on existing research on capability traps, market formation, and managing sustainability, we focus on the forces constraining organizations from developing the capabilities and market infrastructures required for sustainability transformations. We characterize types of sustainability initiatives and, using causal loop diagramming, visualize structures that enable and constrain how organizations can navigate individually and collectively worse-before-better dynamics resulting from uncertain, nonlinear, and delayed returns. Being under day-to-day pressures and deeply intertwined within their environment, organizational actors find it difficult to recognize, undertake, maintain, and coordinate necessary efforts internally and externally. We discuss research implications and directions for future research on avoiding these traps and accelerating sustainability transformations.

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Syst. Dyn. Rev. **39**, 404–431 (2023)

Introduction

Addressing the major global environmental and social sustainability challenges requires monumental efforts across all societal levels (Slawinski and Bansal, 2009; Steffen *et al.*, 2015; Randers *et al.*, 2019). Organization-based actions are critical as organizations form the cogs of the market systems that not only satisfy day-to-day consumer needs and secure jobs and incomes but also drive global unsustainability through raw material depletion, renewables overuse, resource-intensive production, conspicuous consumption, waste and pollution, incentives favoring short-termism and inequalities, etc. Furthermore, because organizations control allocation of most physical and financial

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Accepted by Andreas Größler, Received 3 May 2022; Revised 8 November 2022; 28 April 2023 and 26 June 2023; Accepted 24 July 2023

System Dynamics Review

System Dynamics Review vol 39, No 4 (October/December 2023): 404–431

Published online in Wiley Online Library

(wileyonlinelibrary.com) DOI: 10.1002/sdr.1742

resources, they are key to both their own transformation and that of markets and societies. Yet, whereas organizations increasingly implement sustainability initiatives and report their impacts on climate, forests, and water (CDP, 2021), actual action—whether measured via magnitude, speed, or impact—remains well below that needed for societal transformation toward environmental and social sustainability (United Nations Global Compact, A Strategy, 2015; Höhne *et al.*, 2020; Day *et al.*, 2023).

This lack of impactful sustainability-oriented efforts may seem surprising given the long-recognized strategic opportunities for action. For example, McKinsey (2010) showed over 10 years ago that nearly one-third of global total greenhouse gas emissions can be mitigated with existing technologies at negative cost. Sustainability-oriented efforts provide competitive advantage through innovation within a changing competitive landscape; increase employer attractiveness and reputation due to the increased transparency, stakeholder engagement, and supplier, customer, and employee trust such efforts provide; reduce costs and risk; and enhance access to finance in the long run (e.g. Russo and Fouts, 1997; Hopkins *et al.*, 2011; Cheng *et al.*, 2014; Eccles *et al.*, 2014; Delmas *et al.*, 2015; United Nations Global Compact, A Strategy, 2015; Flammer *et al.*, 2019). Additionally, external pressures—e.g. from the general public (Fridays for Future, 2022) and investors (Fink, 2018, 2022)—to become more sustainable are mounting.

Various explanations exist for this sustainability action shortfall. Economists indicate hidden costs or unrealistic benefits (Gillingham *et al.*, 2009), and market failures due to lack of capital or incentives resulting, for example, from principal–agent problems (Jaffe and Stavins, 1994) or asymmetric information problems (Howarth and Sanstad, 1995). Corporate social responsibility (CSR) researchers highlight behavioral factors that may affect decision-makers' willingness to act (Delmas and Burbano, 2011). For example, differing actor perceptions (Farooq *et al.*, 2017) and attention limitations (DesJardine and Shi, 2021) can discourage efforts, because potential benefits are often uncertain and contested. Consequently, managerial decisions face conflicts, contradictions, and tensions (Burbano *et al.*, 2022; Lee *et al.*, 2022), leading to inaction, or symbolic action including greenwashing (for extensive reviews, see, Carroll and Shabana, 2010; Burbano *et al.*, 2022).

Despite the merits of such theories highlighting barriers to ambitious organization-based action, an important puzzle remains: many organizations fail to undertake ambitious, effective, sufficient, or timely action despite favorable circumstances such as capital availability, incentives, etc. (Lyneis and Serman, 2016; Kaplan, 2019; Henderson, 2020); by contrast, there are (sporadic) successes within otherwise slow-changing contexts. Regarding the latter, consider flooring company Interface. In 1994, Interface CEO Ray Anderson realized that his organization—and the entire petroleum-intensive carpet manufacturing industry—was unsustainable. After a 20-year-long journey Interface achieved carbon neutrality (Interface, 2020). Taken together,

empirical evidence of such successes and failures suggests that the outcome of many sustainability initiatives hinges on how organizations navigate sustainability-transformation challenges given the barriers. This calls for a research orientation focused on the processes and dynamics of developing, implementing, and scaling organizational initiatives toward sustainability.

We take this approach and further argue that the phenomenon of capability traps lies at the center of the challenge of large-scale successful ambitious sustainability initiatives.¹ Developing different capabilities is crucial for large-scale change because capabilities provide organizations with the “capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end” (Amit and Shoemaker, 1993, p. 35). Capability traps entail self-reinforcing pressures to increase firm performance leading actors to favor short-term solutions with more salient payback and fewer apparent needs for new capabilities over long-term ones (Levinthal and March, 1993; Reppenning and Sterman, 2002; Rahmandad *et al.*, 2018). Lyneis and Sterman (2016) show, in the context of efficiency improvements, that organizations pursuing sustainability can fall into capability traps. Beyond efficiency programs, new capability development is central to nearly any sustainability effort (Hart, 1995), as also illustrated by the theoretical grounding in the resource-based view (Barney, 1991; Russo and Fouts, 1997) and that of dynamic capabilities (Teece *et al.*, 1997) of CSR research. The importance of capabilities for sustainability transformations suggests a risk of capability-trap-like dynamics and helps explain why many organizations favor less ambitious efforts involving carbon offsets or energy efficiency rather than fundamentally altering their business models, products, or services for sustainability.

Whereas the role of capability-trap-like dynamics in sustainability transformations may be intuitive, it is critical to consider the larger social systems of organizations and actors within which the efforts occur (Burbano *et al.*, 2022). Transformative action must overcome focal actors’ behavioral and cognitive barriers to change (Bazerman, 2008). Further, it relies on different norms, practices, and structures that are deeply rooted within societal layers including different organizations, the market, institutions, communities, and countries (King and Lenox, 2000; Delmas and Toffel, 2004; Schilke, 2018). Therefore, large market shifts often require the development of alternative market infrastructures—consumer willingness to consider product categories, standards, established firm roles, compatible complementary products, favorable regulation, etc. (Lee

¹We use the term “sustainability initiatives” to indicate our focal unit of analysis: The different sustainability-oriented undertakings, endeavors, or bundles thereof at the organization or market level. Further, we define “sustainability transformations” as large-scale, radical changes toward sustainability, whether at organizational or market level. This use differs from sociotechnical transitions research (Geels and Schot, 2007), which tends to use “transitions” for changes within societal sub-systems and “transformations” for large-scale societal changes (Hölscher *et al.*, 2018). Our use follows Oxford English Dictionary definitions of transformation (a process of “marked change in form, nature, or appearance”) and transition (“the process of change from one condition or state to another”).

et al., 2018). Because such market infrastructure development is central to many sustainability transformation challenges, leverage for change often lies to a great extent outside the control of individual organizational units or organizations undertaking the initiative. This high interdependency between distinct and distributed actors and socio-material structures further reveals sustainability transformations as dynamically complex processes with multiple nonlinear feedbacks interplaying over time, through which actors must navigate diverse intra- and/or interorganizational capability traps.

This paper examines the phenomenon of sustainability transformations, offers a systems lens for analyzing and understanding its challenges, and provides initial insights for future research for accelerating success and impact. The main conceptual underpinnings of this research include: (i) capability-trap dynamics; (ii) the broader system, specifically intra- or interorganizational actors, actions, and reactions; and (iii) a behavioral view, specifically the role of endogeneity of ambitions and efforts and actors' mindsets, time horizons, and an individual versus collective orientation. Because of the dynamic complexity, broad boundary, and actor interdependency of sustainability-transformation challenges, system-dynamics-based research can provide important contributions. Below, we first characterize and visualize sustainability initiatives through a two-dimensional framework of intra- and interorganizational transformation challenges, drawing on real-world examples. Second, using high-level conceptual causal loop diagramming, we map out key drivers of the challenges, respectively for intra-firm capability building (Repenning and Sterman, 2001, 2002) and interorganizational market formation and market infrastructure development (Lee *et al.*, 2018). Finally, we formulate specific guiding questions—addressing dynamic complexity, strategies, and mental model changes—to spur sustainability-transformation research.

Sustainability initiatives at the intra- and interorganizational levels

Many organizational sustainability-transformation problems entail a perceived trade-off between doing well (achieving and maintaining financial performance) and doing good (reducing environmental impact and/or increasing social benefits). This perceived trade-off is commonplace among decision-makers, with many hesitant to undertake ambitious sustainability initiatives with win–win potential (Slawinski and Bansal, 2009; Lyneis and Sterman, 2016). Instead, many organizations act on low-leverage, isolated, and single-pronged initiatives, or stagnate after early efforts (Margolis and Walsh, 2003; Scott and Becken, 2010; Kaplan, 2019; Day *et al.*, 2023). A dynamic view reveals this perceived trade-off as typically false, at least when considering the longer term that allows perceiving materialization of subtle and initially less-tangible benefits of sustainability transformation. Because many sustainability initiatives require considerable upfront investment and resource commitments, organizations often exhibit

poor short-term financial performance before achieving this win–win situation (Hart and Ahuja, 1996). This pattern is known as worse-before-better (WbB) dynamics (Repenning and Sterman, 2002).

Research suggests that the extent and duration of the performance shortfall organizations must navigate during such WbB challenges depends on the nature of sustainability initiatives through both intra- and interorganizational factors. Sterman (2015) conceptualized the problem of sustainability initiatives around their “process improvement half-lives” (p. 52) increasing with technical and organizational/political complexity. Regarding interorganizational market-formation processes, Lee *et al.* (2018), and Lee *et al.* (2022) for sustainability contexts, showed that an increasing need for market infrastructure drives supply and demand uncertainty and collective action problems. Whereas WbB dynamics of sustainability challenges arise at intra- and interorganizational levels alike, differentiating between them is important as their underlying mechanisms, and thus required solutions, differ. Building on existing research, we outline how sustainability initiatives with greater ambition along the intra- and interorganizational sustainability dimensions increase organizational leverage for start-up, established, public, and private enterprises, but can also lead to greater challenges (Figure 1).

Figure 1 shows that high-leverage sustainability initiatives require organizations to build distinct intraorganizational capabilities (horizontal axis) and/or develop greater interorganizational market infrastructure (vertical axis). Whereas initiatives are positioned on any point in the continuous two-dimensional space, we use quadrants (Qs) for analytical purposes. Initiatives displayed in QI are simpler, quicker to achieve, and less difficult to coordinate. Future benefits can be easily imagined and materialize quickly. Examples are corporate carbon tracking and reporting initiatives, such as that by engineering and technology company Bosch, which calculates scope 1 and 2 carbon emissions of its 400 worldwide locations (Bosch, 2021). As information on energy use, CO₂-equivalent emissions, etc., is relatively easy to obtain, this initiative can be implemented within existing business practices. Another example is retailer Walmart’s ecoefficiency program, which entails reducing packaging and other resources, in part by exercising its negotiation power over suppliers. Because the efforts reduce unit costs, these initiatives align with Walmart’s business model of affordability and economies of scale (Plambeck, 2012). Contrasting these examples, more ambitious initiatives require more extensive new organizational capabilities (QII). Examples of this include Microsoft pursuing its stated goal of being carbon negative by 2030 (Smith, 2020). Other high-leverage initiatives may require distinct market infrastructure and actor coordination across organizations (QIII). For example, European Sleeper is one of several actors seeking to expand public alternative mobility by reviving the public night-train network across Europe. Major challenges for upscaling are building consumer awareness and consideration—as adoption involves lifestyle changes—and coordinating with national railways

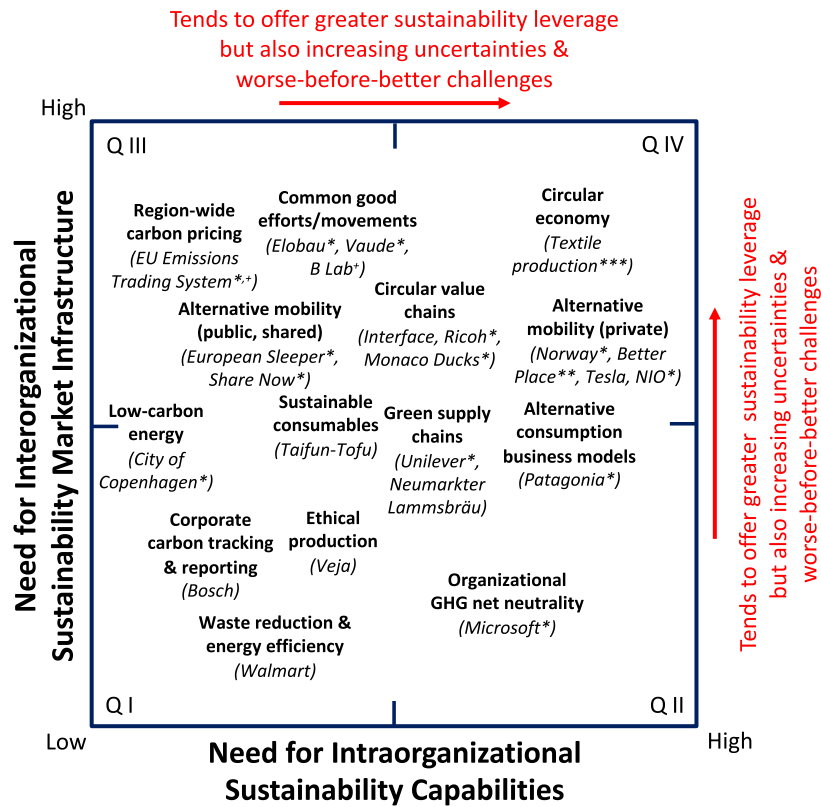


Fig. 1. Characterization of intra- and interorganizational sustainability initiatives. The figure shows illustrative initiatives discussed throughout the paper. Superscripts: initiatives underway (*), failed (**), envisioned (***), and supporting business-to-business (+) [Color figure can be viewed at wileyonlinelibrary.com]

and governments to allow high-visibility ticket sales channels, schedules, etc. (Posaner and Cokelaere, 2023; Symons, 2023). Carsharing initiatives, whether from private organizations such as Share Now (Jochem *et al.*, 2020) targeting urban areas, or community-based efforts aiming to improve mobility for rural/low-income populations (Brown, 2023), face similar complex coordination challenges in their efforts to scale up. Many institutional-/governmental-level efforts, such as the city of Copenhagen seeking to facilitate a transition from high- to low-carbon-intensive energy supply (Stratton, 2020), or the European Union developing a region-wide carbon market (European Commission, 2022a), require action from many actors. Other initiatives involve organizations pursuing fundamentally alternative business models based on holistic visions of value creation grounded in principles of the common good; deep interdependency of the environment, society, and economy; and collaboration. Industrial automation

company Elobau and mountain sports equipment producer Vaude are both on such a journey, guiding stakeholders via standard reporting based on the “common good economy” (Fiedler *et al.*, 2019; Elobau, 2022).² Such efforts further illustrate the tight intercoupling of nonmarket- and market-based initiatives.

Many efforts require organizational capabilities *and* market infrastructure developments. This applies to greening supply chains, whether involving new companies, such as French footwear brand Veja created with the aim of achieving ethical and sustainable production (Beavis, 2012); or multinationals, such as consumer good company Unilever undertaking sustainable sourcing initiatives (Dolsak and Prakash, 2020). Most ambitious, however, are initiatives displayed in QIV. For those, success hinges on the simultaneous large-scale development of organizational capabilities and intraorganizational market infrastructure. Interface’s journey toward net zero carbon emissions involved continuous innovation and development of new capabilities for sustainable products, and recycling and reusing materials, requiring supplier and customer engagement to commit to large changes (Interface, 2020). Other organizations are developing circular value-chain-based business models; e.g. footwear company Monaco Ducks aims to introduce a circular sneaker by 2025 (Monaco Ducks, 2023) and electronics company Ricoh strives toward a circular business via its 2030 environmental, social, and governance targets (Hopkinson *et al.*, 2018; Ricoh, 2022). Patagonia reinvented its business model based on alternative consumption—including long use and repair—of superior-quality and reduced-footprint products (Chouinard and Stanley, 2012; Ram, 2021).

Another example is low-carbon private mobility through electrification of the private-transportation sector, which is currently underway in Norway (Andrew, 2021). To achieve this, multiple organizations must develop capabilities to produce novel products and services, develop standards, and connect offerings to yet-to-be-developed lifestyle choices. Central to this problem is that various organizations are responsible for developing new market infrastructures that can support the self-sustaining exchange of environmentally and socially benign practices and services. This requires involvement from nonmarket actors (e.g. governments developing favorable regulation; Misch *et al.*, 2021). Worldwide, many initiatives are being undertaken or considered to stimulate alternative fuels and electric vehicles (EVs), and the transformation to EVs is inevitable; however, thus far, Norway is one of the few countries to fully integrate EVs into the mobility market. Finally, most ambitious is transforming a whole sector, e.g. the textile industry, toward a circular economy. Achieving this requires completely distinct capabilities and fundamental changes across the entire ecosystem of suppliers and consumers (European Commission, 2022b).

²Transformational efforts can contain multiple, differently positioned, initiatives, even within the same company. Patagonia’s and Ricoh’s efforts can be seen to also include elements of common goods initiatives. However, Figure 1 is intended to help characterize distinct initiative types.

Overall, per Figure 1, we can usefully characterize sustainability initiatives along two dimensions, with distinct opportunities, but also with varying WbB challenges requiring different solutions. Initiatives situated further toward QIV can yield a more fundamental transformation toward sustainability and so offer higher leverage for impact. However, a greater need for intraorganizational capabilities and interorganizational market infrastructure also implies greater uncertainty about implementation duration, potential payback, and general achievability. Managers will question potential outcomes, strategic direction, intervention priorities, investment levels, their organization's role in the forming market, etc. Therefore, maintaining managerial support for sustainability initiatives will be challenging. For similar reasons, large-scale interorganizational transformations often involve coordination challenges. Market infrastructure development likely requires investment beyond individual organizational capabilities, which then necessitates interorganizational coordination. Alongside actors' uncertainty about outcomes, they may hold different and conflicting views about market development and the coordination extent and type. Thus, collective action problems may arise, leading to inaction, despite many actors being interested in succeeding (Lee *et al.*, 2018). The WbB challenge is greatest when organizations must develop distinct internal capabilities and simultaneously build market infrastructure (Figure 1, QIV).

This characterization of distinct sustainability initiatives and their challenges helps illustrate WbB dynamics and what it takes to overcome them. Managers may recognize long-term financial opportunities associated with initiatives that offer high leverage for sustainability improvement, yet find it difficult to overcome WbB dynamics associated with their need for intraorganizational capabilities and interorganizational market infrastructure. Further, they may not see a clear path toward achieving future opportunities, or how to coordinate with others, making them reluctant to participate in such initiatives, or facing unlikely success because others are not taking complementary action. Contrastingly, “low-hanging fruit” sustainability initiatives (Figure 1, QI) avoid these short-term sacrifices (Porter and van der Linde, 1995); thus, decision-makers often favor them. Furthermore, whereas these initiatives may (possibly unintentionally) also help build capabilities that allow organizations to later implement successful initiatives that offer higher leverage, isolated low-hanging-fruit initiatives generally do not provide such leverage for transformation. Organizations remain trapped pursuing low-leverage initiatives.

Addressing the problem of organizations focusing on a few “easy wins’... [vs. those addressing major socio-environmental problems] ... and confront [ing perceived] trade-offs between profits and the planet or society” (Burbano *et al.*, 2022, p. 5) requires thorough analysis of the mechanisms involved and dynamics associated with different sustainability initiatives. We examine these in relation to the two dimensions spanning Figure 1.

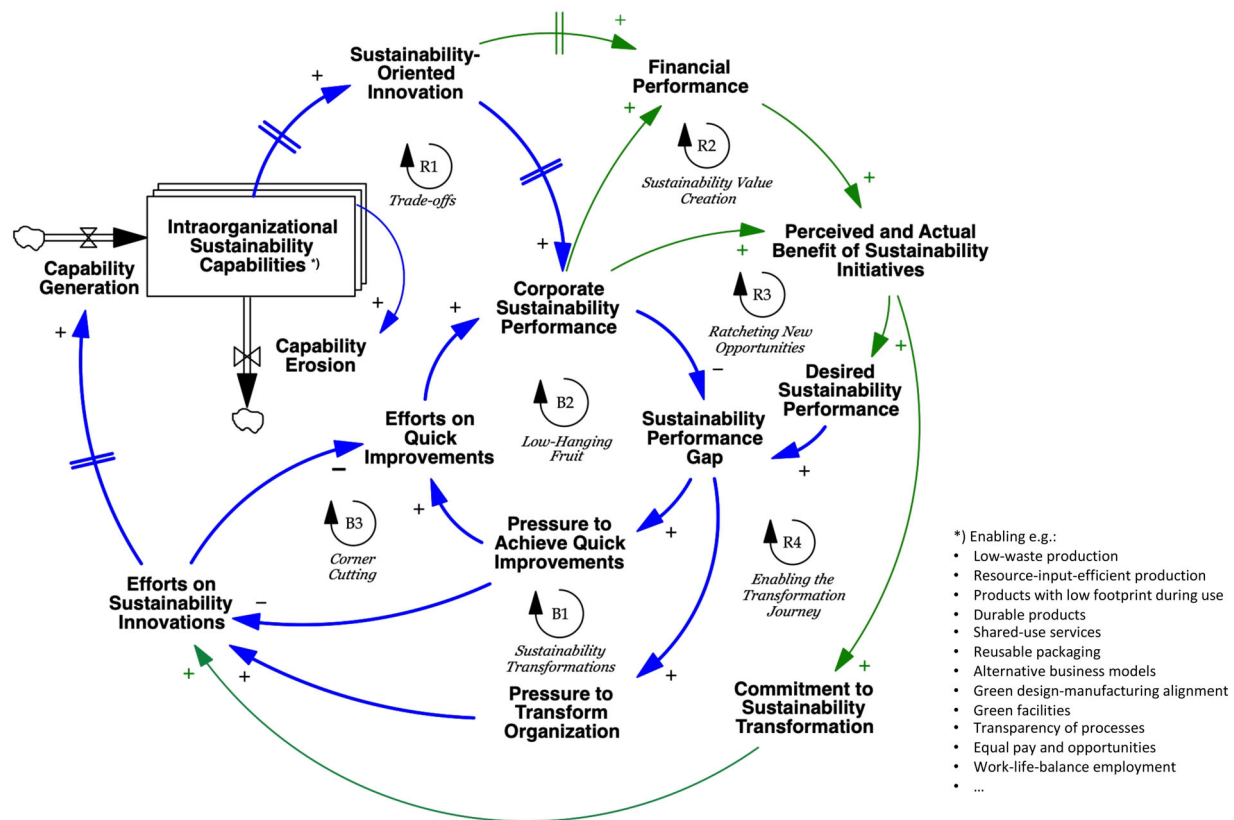


Fig. 2. Feedback structure of intraorganizational capability traps of sustainability initiatives. Classic feedback structure (e.g. Repenning and Sterman, 2001; Lyneis and Sterman, 2016) adapted for sustainability transformations (thick, blue, causal links). Expansions: Multiple capabilities (layered capability stocks) and financial feedback (thin, green, causal links) [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/sdr)]

Dynamics of and challenges for sustainability transformations

Capability traps for organization-level sustainability initiatives

To explain how capability traps may impede sustainability transformations, we begin at the organizational level. Figure 2 depicts the feedback processes of sustainability-oriented capability development. The figure adapts earlier work (Repenning and Sterman, 2001; Sterman, 2015; Lyneis and Sterman, 2016) to the context of sustainability initiatives.³ This figure emphasizes these traps for

³Sterman (2015) and Lyneis and Sterman (2016) extended Repenning and Sterman's (2002) general process improvement model. Sterman (2015) highlighted the different improvement half-lives associated with different sustainability initiatives. Lyneis and Sterman (2016) focused on capability-building for energy-efficiency efforts and capabilities.

established organizations, though they exist for start-up organizations as well (perhaps involving different mechanisms).

Organizational leaders and operational (sustainability) managers must achieve organizational performance consistent with sustainability targets. Two key feedback issues highlight two ways in which organizations can seek to close the sustainability–performance gap. First, managers could consider this gap to result from insufficient capabilities to achieve long-term self-sustaining prosperity aligned with societal sustainability. Figure 2 depicts these as a stock of intraorganizational sustainability capabilities. In the context of efficiency improvement, this could represent organizations' abilities to respond to maintenance challenges or identify root causes, or the condition of buildings and systems and their energy efficiency (Lyneis and Sterman, 2016). More generally, ambitious sustainability-oriented initiatives require the accumulation of diverse capabilities resulting from various deliberate transformative and interdependent efforts (Figure 2, inset text). Such efforts include defining metrics and identifying activities that may yield superior performance; developing alternative products; investing in processes and skilled labor so the workforce can build knowledge of and skills in best practices, accelerate learning, and enhance adherence to new routines; replacing plant and equipment; and building cooperation and trust across the organization and with its partners (Henderson, 2020). Figure 2 emphasizes the distinct organizational capabilities necessary for organizational sustainability transformations through the layered boxes.

Thus, managers may invest in intraorganizational capability improvement (Figure 2, B1, balancing feedback *sustainability transformations*). The above example of Interface illustrates this, with a decades-long process to develop radically distinct capabilities to support a supply chain with most raw materials coming from recycled or renewable sources (Davis, 2014; Interface, 2020). Second, managers could interpret the sustainability–performance gap as a sign of falling behind day-to-day pressures to meet expectations on sustainability performance, and respond to this by improving known and established processes, such as achieving greater energy efficiencies and eliminating waste, so to achieve quick and certain results, or symbolically ramping up communicating on planned improvements to satisfy stakeholders (Figure 2, B2, balancing feedback *low-hanging fruit*). An example of the former is Walmart's ecoefficiency program (Plambeck, 2012), whose efforts are cheaper, more tangible, more predictive, and providing greater short-term returns, thus helping close the gap relatively quickly, but doing little to help transform the organization.

As Repenning and Sterman (2001) and Lyneis and Sterman (2016) show for organizational process improvement efforts, a trade-off between pressures to build capabilities and achieve quick wins develops when the performance gap is sufficiently large. In such cases, there are simply not enough time and resources to satisfy the need for both types of efforts—here, *low-hanging fruit* (B2) and *sustainability transformations* (B1). This interdependency creates

reinforcing feedback (Figure 2, R1, *trade-offs*) that can operate either as a virtuous cycle that cumulatively builds capabilities and performance or as a vicious cycle that degrades both. Organizations that increase the time and resources devoted to transformation will, after a lag, augment their sustainability capabilities and performance, thereby easing the sustainability–performance gap and yielding more time and resources for further transformation in a virtuous cycle. Adhering to long-term goals, despite initial failures and skepticism, allowed Interface to continue its journey toward sustainability with increasing ease (Davis, 2014). Conversely, if managers temporarily focus on achieving low-leverage tangible results via quick implementations, the effort to developing sustainability capabilities decreases, eroding the organization’s sustainability capabilities (Figure 2, outflow “capability erosion”). This widens the gap even more in the future. Managers respond by focusing even more on short-term returns. Thus, the reinforcing feedback (Figure 2, R1) introduces a tipping point between two modes of operation, respectively centered on transforming the organization and pursuing low-hanging fruit. These dynamics are particularly important in competitive situations because organizations nearly always act below their goals. Thus, they face pressure to demonstrate progress, whereas slack is limited, strengthening the trade-off between short-term and long-term orientation (Levinthal and March, 1993; Rahmandad *et al.*, 2018).

Another organizational feedback explains why organizations typically move toward short-term versus long-term goals (Repenning and Sterman, 2001). Managers, not yet experiencing the negative consequence of slow capability erosion, are inclined to divert resources oriented toward long-term transformation to boost short-term performance without seemingly being penalized, thereby creating balancing feedback (Figure 2, B3, *corner-cutting*). Due to this corner-cutting, the trade-off feedback (R1) tends to operate in a vicious direction. Corner-cutting is particularly relevant to ambitious sustainability initiatives, requiring the buildup of distinct capabilities organization-wide. Thus, an initial focus on low-hanging fruit may cause organizations to abandon ambitious initiatives later.

Thus far, our discussion of sustainability initiatives dynamics implies that organizational sustainability initiatives often need to overcome the classic capability trap, but must do this while developing multiple capabilities, therefore facing more complex WbB dynamics, greater uncertainty about success and direction, increased coordination challenges, etc. Furthermore, other organizational feedbacks may become involved, strengthening the system’s tipping behavior. To illustrate, consider sustainability financial-performance feedback issues relevant to most sustainability-transformation efforts (Figure 2, right-hand side, thinner, green lines). First, sustainability performance should eventually yield improved financial performance (e.g. Flammer, 2015; Flammer and Bansal, 2017), stimulating new

sustainability ambitions (Figure 2, R2, reinforcing feedback *sustainable value creation*). However, converting innovation efforts into financial performance takes time, as it requires the development of sustainability capabilities (Kaplan, 2019). Furthermore, with upfront investments and uncertain, highly nonlinear outcomes, organizations can only improve financial performance and extend their goals after fulfilling sufficiently long commitments (Figure 2, R3, reinforcing feedback *ratcheting new opportunities*; note the time delays from “efforts on sustainability innovations” to “financial performance”). If progress in sustainability innovations is slow, slack reduces, and organizations risk being trapped in eroding goal dynamics. Finally, beyond management goals and pressure, effective transformative efforts depend on true commitment (Aguinis and Glavas, 2012). Such commitment grows as managers and other organizational members believe that such change is necessary and possible, and as they can access resources made available through solid financial performance and slack (Figure 2, R4, reinforcing feedback *enabling the transformation journey*).

This sustainability–financial-performance feedback further strengthens the tipping behavior between short- versus long-term orientation. The difference between upfront investment and lagged financial rewards augments the ongoing tension within organizations about the merit of pursuing sustainability. High work pressure, intense competition, and pressure from financial markets mean initial improvements are often harvested through cost-cutting, weakening reinvestment feedback, and making it difficult to build capabilities and resources for continuous improvement. For example, during Unilever’s efforts toward sustainability transformations, its share price fell so much that it was nearly bought by a competitor (Daneshkhu, 2017). Since then, Unilever’s efforts have faced pressure from shareholders concerned about financial performance (Agnew, 2022). Thus, to resist pressure to seek returns from sustainability initiatives prematurely, managers must engage, effectively communicate, and collaborate with internal and external stakeholders. Organizations may ultimately reap the benefits via persistence, patience, and protecting themselves from detrimental stakeholder pressure. To illustrate, managers of family-owned beer manufacturer Neumarkter Lammsbräu decided to switch to organic production processes in 1977. It eventually became Germany’s largest organic beer brewery with stable revenues within an otherwise shrinking beer market (Lammsbräu, 2021; Kühn *et al.*, 2022).

In summary, Figure 2 depicts the structure underlying intraorganizational WbB dynamics associated with ambitious sustainability initiatives. The figure extends challenges related to the classic capability trap, explored in the contexts of process and efficiency improvement. Faced with these challenges, organizations risk becoming stuck in a vicious cycle of eroding goals and faltering ambition. The figure is not intended to be exhaustive and

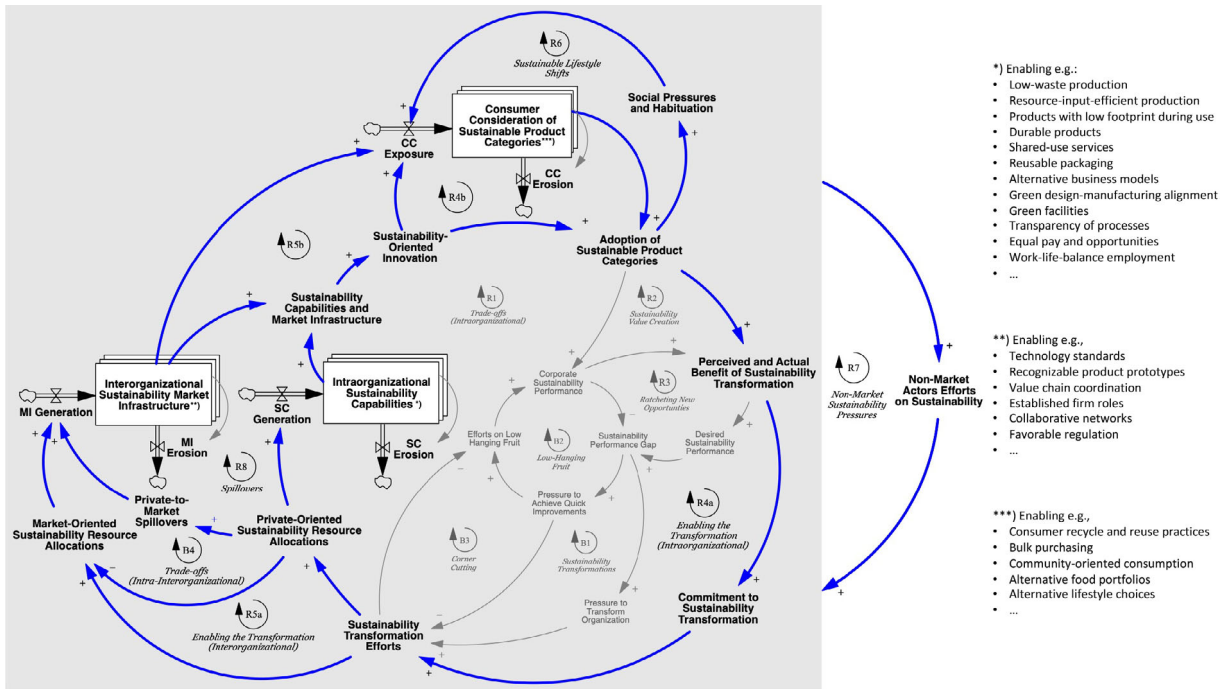


Fig. 3. Feedback structure for market transformation efforts for sustainability initiatives (thick blue causal links, building and expanding on Chan *et al.*, 2016; Struben *et al.*, 2020), including intraorganizational capability traps of sustainability initiatives (gray variable names and causal links; see also Figure 2) [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

additional organizational feedback dynamics may strengthen the challenges.⁴ Efforts that are more transformational, requiring multiple, diverse, and novel capabilities and, therefore, involving longer WbB periods with greater performance shortfalls and higher temporary cost increases are particularly vulnerable to such traps. Navigating successful high-leverage sustainability transformations is therefore a major challenge, even when managers recognize long-term opportunities. Simultaneously, the diagram highlights that organizations can pursue sustainability transformation as several powerful feedback loops begin to operate in a virtuous direction and facilitate ratcheting ambitions and actions.

⁴To name a few: (i) political processes including coalition formation can frustrate sustainability efforts (Levy, 1997); (ii) start-up organizations may get locked into a speed trap, an endogenously produced perceived need for fast action (Perlow *et al.*, 2002), arguably one of the problems EV producer Tesla faced (Boudette, 2018); and (iii), the difficulty of communicating longer-term value creation to stakeholders, driving focus toward more pragmatic and salient efforts (Keith *et al.*, 2022).

A broader system boundary: interorganizational sustainability initiatives

Managers seeking to transform their organizations in pursuit of self-sustaining and environmentally benign practices, products, and services must not only overcome intraorganizational challenges but also those at the market level. Their success nearly always depends on complementary efforts from other organizations and actors. The journeys of Unilever, Neumarkter Lammsbräu, Interface, and Elobau (Figure 1, Greening supply chains, Circular value chains, and Common good orientation) indicate that such transformations also require altered internal processes for partner organizations and new technology standards, informal norms, and shifted roles and responsibilities across the value chains. Further, customers must be willing and able to engage in different consumption practices. More generally, if there is no existing market infrastructure or only limited support for a newly forming market, organizations must undertake considerable market-building efforts. Corporate decision-makers must also try to anticipate other actors' engagement in market-building. In such cases, WbB dynamics may occur both within individual organizations and across the whole market. Dynamics can be complex when building this market infrastructure requires explicit cross-firm coordination and collaboration.

Figure 3 displays sustainability-transformation challenges at the market level. The nature of transformations toward new categories of products and their use implies a requisite buildup of (at least) three types of stocks: (i) distinct intraorganizational capabilities (Figure 3, center); (ii) interorganizational market infrastructure (Figure 3, left); and (iii) consumer consideration of the new product categories (Figure 3, top). Developing these necessitates different organizations individually and jointly overcoming dynamics governed by several reinforcing feedbacks.

First, market transformation requires multiple individual organizations to develop intraorganizational capabilities that are distinct from those that support “business as usual.” Consider mobility start-up Better Place founded in 2007 (Chafkin, 2014). Centering its business model on an EV market take-off, the firm developed and produced charging infrastructure that involved swapping an empty EV battery for a full one in 2 minutes. Such an initiative can only succeed when being supported by several other new services and technologies, including battery-swapping, mass-scale optimized battery recharging, EV models, information technology to support consumers locating stations, etc. Different organizations must therefore develop novel intraorganizational capabilities. If successful, more financial and human resources become available, leading to further commitment and capability improvements, and so on (Figure 3, R4a, reinforcing feedback *enabling the transformation journey*; see also Figure 2, R4). Yet, during this process, each organization also faces intraorganizational transformation challenges (see Figure 2). Figure 3 indicates these capability trap challenges as well

(feedbacks R1–3 and B1–3, gray variables and links and smaller fonts, embedded within feedback R4a).

Second, opportunities for value creation depend on the presence of new market infrastructure. As initiatives grow, organizations can reinvest part of the resources to further develop and build the market (Figure 3, R5a, reinforcing feedback *enabling the transformation at the interorganizational level*). Furthermore, because of the market scale and as different actors—e.g. producers, retailers, complementors, state agencies, and educational organizations—tend to possess unique capabilities or resources, numerous organizations often must contribute to market infrastructure development. Coordination and collaboration with other organizations and institutions to form a market is therefore a vital foundation for transformative efforts (Henderson, 2020). For example, Better Place's reliance on automotive producers developing viable EV choice options led to a partnership with the Renault–Nissan alliance and coordination on the development of standards for vehicle charging. The various producers of alternative-proteins—edible insects, lab-grown meat, plant-based meat, etc.—face similarly large market infrastructure challenges. Taifun-Tofu, pioneering locally manufactured organic tofu in Europe in the 1990s, engaged with organic farmers in Germany, convincing them to grow and supply soybeans to offer an alternative to the emergence of “green” genetically engineered soybeans in the U.S.A. By closely collaborating through contract farming, Taifun-Tofu was able to not only stimulate organic soy farming but also act as a platform for knowledge-sharing between farmers (Taifun-Tofu, 2022). Similarly, in switching to organic beer production, Neumarkter Lammsbräu created a network of local farmers that developed into an association, ensuring the brewery the supply of high-quality organic raw materials and the farmers fair payments (Kühn *et al.*, 2022). Achieving a working circular economy at the market level requires many such highly coordinated actions to create standards, aligned practices, transparency, etc. Figure 3 highlights two more possible feedbacks between the allocation of private- and market-oriented efforts (Struben *et al.*, 2020; Lee *et al.*, 2018): (i) organizations face a natural trade-off between resource allocation to market- and private-oriented resources, resulting in balancing feedback (B4, *interorganizational trade-offs*); and (ii) contrastingly, resources may spill over from private allocations to benefit the interorganizational market infrastructure, reducing dependence on market-oriented efforts (R8, reinforcing feedback *spillovers*).

Third, consumers must navigate multiple emerging competing product categories that are under development and with which they are initially unfamiliar. As producers of greener products, services, and practices make claims to connect their products to consumers' lifestyles, consumers begin to integrate some into their lives and may adjust their habits (e.g. through reuse and repair, bulk purchasing, alternative diets, lower consumption, community-based energy, and other forms of sharing). Thus, sustainable product categories become

increasingly used and normalized, growing in exposure and consumer familiarity, which further enhances adoption (Figure 3, R6, reinforcing feedback *sustainable lifestyle shifts*).⁵ Success for Better Place required a large subset of consumers to consider buying EVs, despite their fundamentally different driving experience and the minimal examples existing around 2013. This challenge of building consumer acceptance for alternative practices and products is also highly important for shifts toward sustainable fashion or healthy diets. For example, Taifun-Tofu, alongside collaborating with farmers, needed to create a new food category that appealed to consumers who had yet to learn how to integrate tofu into their diets. Building consumer familiarity involved a lengthy process with efforts by both Taifun-Tofu and other market players. It took over 30 years from its founding for Taifun-Tofu to sell products in 12 European markets, including large market shares in Germany and France (Taifun-Tofu, 2022).

Finally, contributions from nonmarket actors—local and national governments, nongovernmental organizations, lobbyists, political actors, etc.—are often valuable or even necessary to support market infrastructure development, or can resist efforts. Better Place, for example, depended on governmental permissions for favorable charging infrastructure placement. Although efforts of nonmarket actors can help seed market-building, often their attention and involvement come only in response to the observed progress of a forming market. In the case of Tesla, governments provided considerable financial support for building its battery factories (Boudette, 2018) because of the expected regional benefits from Tesla's success. In other cases, aspiring market actors publicly call for government attention and support. Better Place's founder Shai Agassi (2009) noted, "What we ask governments to do is to force everybody that comes into this business ... to be bound by international standards, ... so we don't use a connector that is unique, that will lock anybody out." These nonmarket actors' various responses to the developing market close further reinforcing feedback (Figure 3, R7, *nonmarket sustainability pressures*).

These multiple positive feedback loops of sustainability market transformations involving the buildup of both distinct organizational capabilities and market-level infrastructure implies that rapid scale-up requires multiple organizations to overcome WbB dynamics. Whereas market infrastructure may sometimes develop as organizations pursue their goals individually, generally this process is slow and failure-prone, often leading to inaction. Challenges are aggravated by several factors. Specifically, while facing uncertainty about the market-formation potential, individual actors face resource-allocation trade-offs between building the market and building their own capabilities (Lee *et al.*, 2018; Struben *et al.*, 2020). Therefore, if organizations dedicate excessive attention to private-oriented efforts (Figure 3, R1) at the cost of

⁵Feedback R4b in Figure 3 is related to R4a. Both involve market-oriented efforts, but R4b operates through consumer education and marketing (rather than product- and service-related improvements), increasing consumer consideration and consumption. The same applies for the market-oriented efforts feedback R5a and R5b.

others (Figure 3, R2 and R3), market-formation efforts are doomed to fail. However, under high market-formation uncertainty, organizations are less likely to commit efforts to market-building. Furthermore, coordination and alignment challenges across organizations taking on specific roles may become too large when contributions are highly distinct, with actors having wide-ranging views about the development direction or lacking collaboration experience. In such cases, even sufficient resources allocated to the market may not be aligned with each other. Thus, the role of intermediaries becomes crucial. Nonprofit organization B Lab, itself an ambitious sustainability initiative aiming to help transform the global economy in the direction of the common good, has taken up such a role by creating standards, policies, tools, and programs for shifting the behavior, culture, and structural underpinnings of capitalism (Parker *et al.*, 2019). Transforming economies toward sustainability requires many such efforts that help build collective action across distinct actors. Finally, Figure 3 suggests that market-formation challenges related to market infrastructure development are greater (smaller), when (i) the sequence of different actions for market infrastructure is more (less) important, as the risk of consequential misallocations increases (decreases); and (ii) the time to build capabilities or market infrastructure is greater (smaller), as organizations experience longer (shorter) periods before they can reap benefits. Furthermore, when progress is slow, actors will be even less inclined to allocate resources, particularly those that help market-building or do not enter the market at all.

Indeed, Better Place failed despite high expectations because of these intertwined market-formation challenges. However, in 2013 Better Place filed for bankruptcy after failing to scale sufficiently and quickly and having burned through its \$900 million venture capital funds (Kershner, 2013). Better Place's fate was dependent on the willingness of many other market and political players to help build the market, together seeding and strengthening multiple reinforcing feedback loops governing EV market formation. More generally, without commitment by and alignment efforts across the various types of market actors—automotive producers developing multiple EV models, battery manufacturers offering affordable and high-density batteries, charging infrastructure providers offering fast and widespread charging options, and governments offering support of and campaigning around EV driving, all of which must be largely compatible—EV choice options remain limited and unattractive, and few consumers consider these vehicles. Under such joint demand and supply uncertainty, most companies face unclear opportunities and high risks, resulting in reluctance to allocate/commit resources and to coordinate with others (often competitors), despite such initiatives being critical to successful market formation.

Better Place's failure not only led to its demise but also comprised a major setback for the transition toward future sustainable transportation. Reputable analysts underestimated these challenges and were vastly optimistic in their

projections of EV market growth (Ackermann and Ferziger, 2012). Recently, excitement about EVs and their adoption within major global markets has rebounded. Among new initiatives, the option of battery swapping has resurged—e.g. through Chinese start-up NIO (Murray, 2022). Although it is unlikely that transport electrification will fail again, challenges persist (e.g. limited infrastructure, standards competition, consumer unfamiliarity, auto manufacturer reluctance, slow vehicle replacement, and the greening of the electric grid), implying that sustainability impacts from EVs will be limited over the next decade.

In summary, our arguments imply the need for greater collective action to overcome market-level sustainability-transformation challenges, per existing research (e.g. Henderson, 2020). Market transformation dynamics toward sustainability are particularly complex because it is often unclear which opportunities exist and what must be done to achieve them, which gives rise to collective action start-up problems during market formation (Lee *et al.*, 2018). In such cases, developing both shared views and a willingness to align resource commitments among actors is particularly challenging. Consequently, despite perceiving long-term potential opportunities, actors do not commit sufficient resources, or fail to align them, with lack of market infrastructure and organizational capabilities creating multiple capability traps and strong WbB dynamics at the interorganizational level.

Conclusion, discussion, and future research directions

Addressing current global environmental and social sustainability challenges requires fundamental and large-scale societal change. With organizations and markets central to this transformation challenge, the question is not whether organizations need to act on sustainability, but how organizations can successfully, timely, rapidly, and most impactfully, achieve large-scale organizational and market transformations.

Given the long history of failures and considerable evidence of organizations' limited willingness to act, numerous wait-and-see approaches, free-riding, and greenwashing efforts within and across industries (Carroll and Shabana, 2010; Burbano *et al.*, 2022; Day *et al.*, 2023), widespread cynicism about the prospects of meaningful organizational action for sustainability is understandable. Consistent with this, researchers have identified numerous barriers to action centered on uncertainty surrounding the organizational benefits of doing good. Others suggest that barriers can be lowered by redefining “value creation” within the capitalist system (Henderson, 2020), or reformulating organizational purposes (Hollensbe *et al.*, 2014; Ocasio *et al.*, 2023). Elobau's (2022) actions toward common goods standards signifies such efforts. We agree with the importance of reorienting decision-makers' mental models to dispel the perceived doing good–doing well trade-off. However, such redefinition is

challenging, and it risks decoupling from real action on social and environmental issues (Kaplan, 2023). We argue that given the urgency, researchers and decision-makers must understand how organizations can overcome said barriers and navigate the dynamic complexity of transformations toward sustainable practices, products, services, and (redefined) value creation with impact and scale. Further, because organizations often must develop multiple new capabilities, the capability trap challenge forms an important focus point for managing sustainability transformations. Building on existing capability traps research, success requires not only commitment to different aspirations, but investments large enough and for long enough to cross tipping thresholds and convert the vicious cycle into a virtuous cycle of better performance, greater investment, and still better performance (Lyneis and Sterman, 2016). The greater dynamic complexity of intraorganizational and interorganizational sustainability transformations—involving more distinct capabilities, more actors, and more feedback interactions between them—has implications for both the change that can be achieved and the challenge in getting there.

We provide several initial insights about managing such sustainability transformations. First, decision-makers must identify ambitious aspirations and understand the implications for their organizations in achieving them. This requires differentiation of initiatives that yield greater sustainability leverage (but also require more distinct intraorganizational capabilities and/or a specific interorganizational sustainability market infrastructure; Figure 1, QII–QIV) from those yielding lower leverage (requiring limited intraorganizational sustainability capabilities and interorganizational sustainability market infrastructures; Figure 1, QI). Further, organizations should be prepared to navigate paths of high-leverage organizational transformation that are slow and failure-prone, as illustrated by Interface's 20-year journey toward net zero emissions. Corporate and political leaders should also understand that essentially all organizations will undergo such fundamental transformations toward sustainability-oriented practices, products, organizations, and markets within the coming decades. Further, whereas the transformation vision and efforts may perhaps start top-down, they must eventually permeate the entire organization.

Second, increasing the undertaking and successful implementation of sustainability initiatives that can achieve these transformations rapidly (and avoid derailing or slowdown) requires a focus on how WbB dynamics instigate multiple capability traps. These traps occur at both intraorganizational and interorganizational levels (see Figures 2 and 3, respectively). Our high-level conceptual mapping of the behavior of dynamic complex social systems and presented understandings of sustainability transformations illustrates key points for both the intra- and interorganizational levels. requisite capabilities or market infrastructures only develop if organizations resist yielding to pressures to take easier paths. Thus, the various actors involved must embrace longer time horizons. Commitment to ambitious sustainability targets, while anticipating WbB dynamics and sticking to ongoing concrete

actions, reduces uncertainty and is critical for avoiding a vicious cycle of eroding goals and decreasing ambition. It is however also clear from the transformations of Interface, Patagonia, and Elobau, and given sustainability transformations' dynamic complexity and duration, that such changes are to be considered journeys whose ongoing progressive actions build on one another and feed further learning and formulation of newer, clearer, and more ambitious aspirations (Mintzberg, 1978). Thus, sustainability transformations require organizations to be simultaneously forward- and systems-thinkers, ambitious, and adaptive.

Third, high-leverage interventions that speed up transformations toward sustainability must not only be sustained with strong long-term commitment, but also involve myriad other actors. The significant interdependency at intra- and interorganizational levels suggests that transformations require decision-makers to have a collaborative mindset. This contrasts the more siloed thinking, limited patience, and short-termism that often dominates in organizations (Kaplan, 2019). Actors must also consider the broader boundary implications of their organizational aspirations. For example, large absolute growth of alternative offerings does not necessarily imply successful transformation regarding sustainability. In the case of mobility, as long as EVs neither displace the most polluting conventional cars nor utilize low-carbon energy sources, benefits remain limited. Likewise, whether in consumables, mobility, or fashion, if consumers do not alter their behavior, their adoption of green products and services creates rebound effects (e.g. lower-priced Walmart products enabling greater consumption elsewhere; Tesla EVs serving as additional vehicles; Patagonia clothing purchased for fashion-related reasons). Therefore, fulfilling sustainability transformations requires understanding their underlying complexity and interconnections, as well as the involvement of many stakeholders, including citizens.

These insights about sustainability transformations, and their underlying analysis, are intended as seeds for further research rather than as exhaustive and final explanations. For example, established and start-up organizations may face specific transformation challenges, and political or legislative processes may further affect these. Future research on sustainability transformations should build on understanding of capability-trap dynamics and the large bodies of CSR and market-formation literature. Our suggested direction is consistent with recent discussions within the CSR research community, recognizing the need for an integrative approach (Frynas and Yamahaki, 2016), and specifically one that is grounded in systems thinking (Burbano *et al.*, 2022). To help guide this research, we provide several questions focusing on the *dynamic complexity* of sustainability transformations, and the *strategies* and *mental models* needed for lasting change with deep impact:

- Regarding *dynamic complexity*, what core mechanisms constrain actors from effectively undertaking sustainability transformations by moving from established unsustainable practices toward those consistent with social and environmental sustainability?
 - What organizational capabilities are critical for transformations toward sustainability?
 - Which elements of sustainability-oriented market infrastructures are necessary for market (trans)formation?
 - How do the requirements for both developing organizational capabilities and building market infrastructure for sustainability transformations interplay and affect decisions regarding private- and market-oriented resource allocations and their trade-offs?
 - What mechanisms underlying WbB dynamics can form obstacles for achieving intra- and interorganizational transformations?
 - What, depending on organizational/market context, is the relative importance of the different intra- and interorganizational feedback loops?
 - What role do nonmarket (e.g. political) actors play in the transformation process?
 - What mechanisms, inside and outside organizations, increase pressures for short-term results?⁶
 - How can pet projects, as perceived early steps to success, be distinguished from real initiatives toward sustainability transformation in overcoming WbB behavior?
- What *strategies* and approaches can help move actors, individually and collectively, toward sustainability transformations, rather than just facilitating incremental changes?
 - How should organizations manage tensions between ambitious goals and producing concrete ongoing action with salient results?
 - What is the role for adaptive strategies that iterate between sustainability-oriented purposes, ambitious goals, and concrete action in navigating such transformations?
 - How can approaches that center on actor coordination within and across organizations help organize the collective action necessary for sustainability transformations?
 - How can managers better assess the extent to which their organization should undertake market-oriented efforts—including consumer consideration—and coordination versus private/organization-oriented efforts?
 - How should attention to market versus private efforts evolve during different stages of transformations?

⁶We thank an anonymous reviewer for pointing us in the direction of these last two questions, as well as the second question under “changes to mental models” below.

- How can policy-makers help organizations navigate sustainability transformations?
- How can changes to *mental models* help increase actors' willingness to move away from "business as usual" within an interdependent and slow-moving environment that rewards tangible and short-term results?
 - What are the key components of transformational thinking among the different actors? For instance, what are the respective roles of risk perception, time horizons, boundaries of assessment, and individual versus collective/collaborative mindset?
 - What would it take for relevant actors to become more patient, to become more long-term oriented? Would actors' understanding of dynamics (e.g. of capability traps) help them become more forward-thinking, patient, and able to navigate transformation journeys?
 - What approaches help actors develop skills for assessing whether apparent barriers involve a WbB situation that can be overcome via long-term orientation and commitment?
 - Can alternative business models achieve significant sustainability impact without radically altered consumption practices?

In addition to spurring research on sustainability transformations, the conceptual mapping and research questions can serve an educational purpose. Such efforts can help inform decision-makers more directly about the importance of and opportunities for effectively undertaking sustainability transformations. For example, engaging HSBC Bank decision-makers with the system-dynamics-based climate policy simulator En-ROADS has helped strengthen the bank's climate action (Kapmeier *et al.*, 2021). Such efforts may contribute to necessary shifts toward broader boundary thinking, inclusive value creation, and more collective-oriented mindsets among market players.

In closing, we stress the evolving nature of sustainability-transformation-oriented efforts. Patagonia's founder Yvon Chouinard recognizes this, stating "[i]t's been nearly 50 years since we began our experiment in responsible business, and we are just getting started" (Chouinard, 2023); this mindset sharply contrasts with the typical business case, treating Patagonia as the archetypal illustration of CSR success. Thus, having overcome initial WbB dynamics does not mean the transformation journey is complete.

Acknowledgements

The authors thank reviewers for their guidance, and participants of the 2022 Gronen Research Conference, the 2022 International System Dynamics Conference, and the 2022 Conference of the Sustainability Management Section of the German Academic Association for Business Research (VHB) for helpful comments on earlier versions of this paper.

References

- Ackermann G, Ferziger J 2012. Better place plans electric-car Ipo within 2 years, Agassi says. *Bloomberg*.
- Agassi S. 2009. Gartner interviews Shai Agassi of better place, part 2. In *Gartner*, Steenstrup K (ed). Gartner: Stamford, CT. Retrieved 24 October 2022. Available from <https://www.gartner.com/document/942915?ref=solrResearch&refval=343846950>.
- Agnew H 2022. Unilever has 'lost the plot' by fixating on sustainability, says Terry Smith. *Financial Times*.
- Aguinis H, Glavas A. 2012. What we know and Don't know about corporate social responsibility: a review and research agenda. *Journal of Management* **38**(4): 932–968.
- Amit R, Shoemaker P. 1993. Specialized assets and organizational rent. *Strategic Management Journal* **14**(1): 33–47.
- Andrew RM 2021. Norway EV Sales and Related Data. Retrieved 24 January 2022. Available from <https://robbieandrew.github.io/EV/>.
- Barney J. 1991. Firm resources and sustained competitive advantage. *Journal of Management* **17**(1): 99–120.
- Bazerman MH 2008. Barriers to Acting in Time on Energy and Strategies to Overcoming Them. Harvard Business School Working Paper (09–069).
- Beavis L 2012. Veja: an ethical passion for fashion. French footwear brand combines better conditions for Brazilian farmers with fashion, fair trade and ecology. *The Guardian*.
- Bosch 2021. Shifting Paradigms Sustainability Report 2020. Robert Bosch GmbH, Stuttgart. Retrieved 24 January 2022. Available from https://assets.bosch.com/media/global/sustainability/reporting_and_data/2020/bosch-sustainability-report-2020-factbook.pdf.
- Boudette NE 2018. For Tesla, 'Production Hell' Looks like the Reality of the Car Business. New York, NY. Retrieved 21 December 2020. Available from <https://www.nytimes.com/2018/04/03/business/tesla-model-3.html>.
- Brown PL 2023. There's No Uber or Lyft. There Is a Communal Tesla. New York Times. Retrieved 19 June 2023 Available from: <https://www.nytimes.com/2023/06/16/business/ev-ride-sharing-volunteers.html>.
- Burbano VC, Delmas MA, Cobo Martin MJ 2022. The Past and Future of Corporate Sustainability Research (September 2022). Available from: <https://ssrn.com/abstract=4236578>.
- Carroll AB, Shabana KM. 2010. The business case for corporate social responsibility: a review of concepts, research and practice. *International Journal of Management Reviews* **12**(1): 85–105.
- CDP 2021. The a List 2021. CDP. Retrieved 24 January 2022. Available from <https://www.cdp.net/en/companies/companies-scores>.
- Chafkin M 2014. A broken place: the spectacular failure of the startup that was going to change the world. Retrieved 07 April 2014. Available from <https://www.fastcompany.com/3028159/a-broken-place-better-place>.

- Chan D, Struben J, Dube L. 2016. CSR-mainstreamed innovation: market transformation for scaled solutions to socio-economic inequity. *Academy of Management Proceedings* **16**(1): 17906.
- Cheng B, Ioannou I, Serafeim G. 2014. Corporate social responsibility and access to finance. *Strategic Management Journal* **35**(1): 1–23.
- Chouinard Y. 2023. Earth Is Now Our Only Shareholder. Patagonia, Inc. Retrieved 29 March 2023. Available from <https://eu.patagonia.com/gb/en/ownership/>.
- Chouinard Y, Stanley V. 2012. *The Responsible Company. What We've Learned from Patagonia's First 40 Years*. Patagonia Books: Ventura, CA.
- Daneshkhu S. 2017. Unilever chief now under pressure to deliver on reforms. *Financial Times*. Retrieved 15 March 2019. Available from <https://www.ft.com/content/a2f1fe90-f792-11e6-bd4e-68d53499ed71>.
- Davis M. 2014. Radical Industrialists: 20 Years Later, Interface Looks Back on Ray Anderson's Legacy, GreenBiz. Retrieved 15 August 2022. Available from: <https://www.greenbiz.com/article/20-years-later-interface-looks-back-ray-andersons-legacy>.
- Day T, Mooldijk S, Hans F, Smit S, Posada E, Skribbe R, Woollands S, Fearnough H *et al.* 2023. Corporate climate responsibility monitor 2023. Addressing the Transparency and Integrity of Companies' Emission Reduction and Net-Zero Targets. New Climate Institute and Carbon Market Watch, Berlin. Retrieved 14 June 2023. Available from: https://www.newclimate.org/sites/default/files/2023-04/NewClimate_CorporateClimateResponsibilityMonitor2023_Feb23.pdf.
- Delmas M, Toffel MW. 2004. Stakeholders and environmental management practices: an institutional framework. *Business Strategy and the Environment* **13**(4): 209–222.
- Delmas MA, Burbano VC. 2011. The drivers of greenwashing. *California Management Review* **54**(1): 64–87.
- Delmas MA, Nairn-Birch N, Lim J. 2015. Dynamics of environmental and financial performance: the case of greenhouse gas emissions. *Organization and Environment* **28**(4): 374–393.
- Desjardine MR, Shi W. 2021. How temporal focus shapes the influence of executive compensation on risk taking. *Academy of Management Journal* **64**(1): 265–292.
- Dolsak N, Prakash A. 2020. Unilver's climate plan: emissions from fossil supply chain and consumers are the real challenge. *Forbes*, 18.
- Eccles RG, Ioannou I, Serafeim G. 2014. The impact of corporate sustainability on organizational processes and performance. *Management Science* **60**(11): 2835–2857.
- Elobau. 2022. Elobau Sustainability Report 2022. Elobau GmbH & Co. KG, Leutkirch. Retrieved 14 June 2023. Available from: https://www.elobau.com/wp-content/uploads/2022/12/221216_elobau_nachhaltigkeitsbericht_2022_en_web.pdf.
- European Commission. 2022a. Eu Emissions Trading System (Eu Ets). European Commission, Brussels. Retrieved 29 March 2023. Available from: https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets_en.
- European Commission. 2022b. Questions and Answers on Eu Strategy for Sustainable and Circular Textiles. European Commission, Brussels. Retrieved 29 March 2023. Available from: https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_2015.

- Farooq O, Rupp DE, Farooq M. 2017. The multiple pathways through which internal and external corporate social responsibility influence organizational identification and multifoci outcomes: the moderating role of cultural and social orientations. *Academy of Management Journal* **60**(3): 954–985.
- Fiedler L, Bongen F, Elleke A. 2019. How sustainability and a culture of trust shape entrepreneurial success at Vaude. In *Rethinking Strategic Management. Sustainable Strategizing for Positive Impact*, Wunder T (ed). Springer: Cham, Switzerland; 329–342.
- Fink L. 2018. Larry Fink's 2018 Letter to Ceos. A Sense of Purpose. BlackRock, Inc. Retrieved 24 January 2021 Available from: <https://www.blackrock.com/corporate/investor-relations/2018-larry-fink-ceo-letter>.
- Fink L. 2022. Larry Fink's 2022 Letter to Ceos: the Power of Capitalism. BlackRock, Inc. Retrieved 24 January 2022 Available from: <https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter>.
- Flammer C. 2015. Does corporate social responsibility Lead to superior financial performance? A regression discontinuity approach. *Management Science* **61**(11): 2549–2568.
- Flammer C, Bansal P. 2017. Does a long-term orientation create value? Evidence from a regression discontinuity. *Strategic Management Journal* **38**(9): 1827–1847.
- Flammer C, Hong B, Minor D. 2019. Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: effectiveness and implications for firm outcomes. *Strategic Management Journal* **40**(7): 1097–1122.
- Fridays for Future 2022. Our Demands. Fridays for Future. Retrieved 24 January 2022 Available from: <https://fridaysforfuture.org/what-we-do/our-demands/>.
- Frynas JG, Yamahaki C. 2016. Corporate social responsibility: review and roadmap of theoretical perspectives. *Business Ethics: A European Review* **25**(3): 258–285.
- Geels FW, Schot J. 2007. Typology of sociotechnical transition pathways. *Research Policy* **36**(3): 399–417.
- Gillingham K, Newell RG, Palmer K. 2009. Energy efficiency economics and policy. *Annual Review of Resource Economics* **1**(1): 597–620.
- Hart SL. 1995. A natural-resource-based view of the firm. *Academy of Management Review* **20**(4): 986–1014.
- Hart SL, Ahuja G. 1996. Does it pay to Be green? An empirical examination of the Relationship between emission reduction and firm performance. *Business Strategy and the Environment* **5**(1): 30–37.
- Henderson R. 2020. *Reimagining Capitalism in a World on Fire*. PublicAffairs: New York, NY.
- Höhne N, Md Elzen J, Rogelj BM, Fransen T, Kuramochi T, Olhoff A, Alcamo J *et al.* 2020. Emissions: World has four times the work or one-third of the time. *Nature* **579**: 25–28.
- Hollensbe E, Wookey C, Hickey L, George G, Nichols CV. 2014. Organizations with purpose. *Academy of Management Journal* **57**(5): 1227–1234. <https://doi.org/10.5465/amj.2014.4005>.
- Hölscher K, Wittmayer JM, Loorbach D. 2018. Transition versus transformation: What's the difference? *Environmental Innovation and Societal Transitions* **27**(2): 1–3.
- Hopkins MS, Kruschwitz N, Haanaes K, Kong MT, Arthur D, Reeves M. 2011. Sustainability: the 'Embracers' seize advantage. *MIT Sloan Management Review* **52**(3): 3–27.

- Hopkinson P, Zils M, Hawkins P, Roper S. 2018. Managing a complex global circular economy business model: opportunities and challenges. *California Management Review* **60**(3): 71–94.
- Howarth RB, Sanstad AH. 1995. Discount rates and energy efficiency. *Contemporary Economic Policy* **13**(3): 101–109.
- Interface 2020. Lessons for the Future. The Interface Guide to Changing your Business to Change the World. Interface Inc., Atlanta, GA. Retrieved 30 December 2021. Available from: <http://interfaceinc.scene7.com/is/content/InterfaceInc/Interface/Americas/WebsiteContentAssets/Documents/Sustainability%2025yr%20Report/25yr%20Report%20Booklet%20Interface%5FMissionZeroCel.pdf>.
- Jaffe AB, Stavins RN. 1994. The energy-efficiency gap what does it mean? *Energy Policy* **22**(10): 804–810.
- Jochem P, Frankenhauser D, Ewald L, Ensslen A, Fromm H. 2020. Does free-floating Carsharing reduce private vehicle ownership? The case of share now in European cities. *Transportation Research Part A: Policy and Practice* **141**(11): 373–395.
- Kaplan S. 2019. *The 360° Corporation: from Stakeholder Trade-Offs to Transformation*. Stanford University Press: Stanford, CA.
- Kaplan S. 2023. The promises and perils of corporate purpose. *Strategy Science* **8**(2): 288–301. <https://doi.org/10.1287/stsc.2023.0187>.
- Kapmeier F, Greenspan AS, Jones AP, Sterman JD. 2021. Science-based analysis for climate action: how Hsbc Bank uses the En-ROADS climate policy simulation. *System Dynamics Review* **37**(4): 333–352.
- Keith DR, Taylor L, Paine J, Weisbach R, Dowidowicz A. 2022. When funders Aren't customers: reputation management and capability underinvestment in multiaudience organizations. *Organization Science*. <https://doi.org/10.1287/orsc.2022.1579>.
- Kershner I 2013. Israeli venture meant to serve electric cars is ending its run. New York Times, 27 May 2013. Retrieved 24 January 2020. New York Times. Available from <https://www.nytimes.com/2013/05/27/business/global/israeli-electric-car-company-files-for-liquidation.html>.
- King AA, Lenox MJ. 2000. Industry self-regulation without sanctions: the chemical Industry's responsible care program. *Academy of Management Journal* **43**(4): 698–716.
- Kühn A-L, Spangler S, Paprotta V. 2022. CSR bei der mittelständischen Bio-Brauerei Neumarkter Lammsbräu. In *CSR in Süddeutschland. Unternehmerischer Erfolg und Nachhaltigkeit im Einklang*, Herzner A, Schmidpeter R (eds). Springer Gabler: Berlin and Heidelberg; 201–212.
- Lee BH, Georgallis P, Struben J. 2022. Sustainable entrepreneurship under market uncertainty: opportunities, challenges, and impact. In *Handbook of Business Sustainability*, George G, Haas M *et al.* (eds). Edward Elgar Cheltenham: UK and Northampton, MA; 252–272.
- Lee BH, Struben J, Bingham CB. 2018. Collective action and market formation: an integrative framework. *Strategic Management Journal* **39**(1): 242–266.
- Levinthal DA, March JG. 1993. The myopia of learning. *Strategic Management Journal* **14**(S2): 95–112.
- Levy DL. 1997. Environmental management as political sustainability. *Organization & Environment* **10**(2): 126–147.

- Lyneis J, Sterman J. 2016. How to save a leaky ship: capability traps and the failure of win-win Investments in Sustainability and Social Responsibility. *Academy of Management Discoveries* 2(1): 7–32.
- Margolis JD, Walsh JP. 2003. Misery loves companies: rethinking social initiatives by business. *Administrative Science Quarterly* 48(2): 268–305.
- McKinsey 2010. Impact of the financial crisis on carbon economics. Version 2.1 of the global greenhouse gas abatement cost curve. McKinsey. Retrieved 2 March 2023. Available from: <https://www.mckinsey.com/capabilities/sustainability/our-insights/impact-of-the-financial-crisis-on-carbon-economics-version-21#/>.
- Mintzberg H. 1978. Patterns in strategy formation. *Management Science* 24(9): 934–948.
- Misch F, Camara Y, Holtmark B 2021. Electric Vehicles, Tax Incentives and Emissions: evidence from Norway (June 2021). In *IMF Working Paper No 2021/162*. Available from: <https://ssrn.com/abstract=4026339>.
- Ducks M 2023. Our Mission. Monaco Ducks, München. Retrieved 15 March 2023 Available from: <https://www.monacoducks.com/pages/circular-md>.
- Murray A 2022. Will Swapping out Electric Car Batteries Catch On? BBC. Retrieved 17 May 2022. Available from: <https://www.bbc.com/news/business-61310513>.
- Lammsbräu N 2021. Presseinformation Jahremeldung 2020. Neumarkter Lammsbräu, Neumarkt. Retrieved 15 August 2022. Available from: https://f.hubspotusercontent20.net/hubfs/2695425/NeumarkterLammsbraeu/resources/documents/Pressemitteilungen/PM%20Lammsbrau%CC%88u_Jahresmeldung%202020_09.03.2021.pdf.
- Ocasio W, Kraatz M, Chandler D. 2023. Making sense of corporate purpose. *Strategy Science* 8(2): 123–138.
- Parker SC, Gamble EN, Moroz PW, Branzei O. 2019. The impact of B lab certification on firm growth. *Academy of Management Discoveries* 5(1): 57–77.
- Perlow LA, Okhuysen GA, Repenning NP. 2002. The speed trap: exploring the relationship between decision making and temporal context. *Academy of Management Journal* 45(5): 931–955.
- Plambeck EL. 2012. Reducing greenhouse gas emissions through operations and supply chain management. *Energy Economics* 34(Supplement 1): S64–S74.
- Porter ME, van der Linde C. 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives* 9(4): 97–118.
- Posaner J, Cokelaere H 2023. The sleeper train awakens. The upstart European sleeper is gambling on a night train revival to link up the continent. *Politico*.
- Rahmandad H, Henderson R, Repenning NP. 2018. Making the numbers? “Short termism” and the puzzle of only occasional disaster. *Management Science* 64(3): 1328–1347.
- Ram A 2021. Patagonia: our Quest for Circularity. Patagonia, Ventura, CA. Retrieved 15 March 2023. Available from: <https://www.patagonia.com/stories/our-quest-for-circularity/story-96496.html>.
- Randers J, Rockström J, Stoknes P-E, Goluke U, Collste D, Cornell SE, Donges J. 2019. Achieving the 17 sustainable development goals within 9 planetary boundaries. *Global Sustainability* 2: e24.
- Repenning NP, Sterman JD. 2001. Nobody ever gets credit for fixing problems that never happened: creating and Sustaining process improvement. *California Management Review* 43(4): 64–88.

- Repenning NP, Sterman JD. 2002. Capability traps and self-confirming attribution errors in the dynamics of process improvement. *Administrative Science Quarterly* **47**(2): 265–295.
- Ricoh 2022. Ricoh Group Circular Economy Report 2022. Ricoh Co. Ltd. ESG Strategy Division, Tokyo. Retrieved 29 March 2023. Available from: https://www.ricoh.com/-/Media/Ricoh/Sites/com/sustainability/environment/practice/cycle/pdf/CEreport_ENG_web.pdf.
- Russo MV, Fouts PA. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal* **40**(3): 534–559.
- Schilke O. 2018. A micro-institutional inquiry into resistance to environmental pressures. *Academy of Management Journal* **61**(4): 1431–1466.
- Scott D, Becken S. 2010. Adapting to climate change and climate policy: progress, problems and potentials. *Journal of Sustainable Tourism* **18**(3): 283–295.
- Slawinski N, Bansal P. 2009. Short on time: the role of time in business sustainability. *Academy of Management Proceedings* **2009**(1): 1–6.
- Smith B 2020. Microsoft Will Be Carbon Negative by 2030. Microsoft, Official Microsoft Blog. Retrieved 24 January 2021. Available from: <https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/>.
- Steffen W, Richardson K, Rockström J, Cornell SE, Fetzer I, Bennett EM, Biggs R, Carpenter SR *et al.* 2015. Planetary boundaries: guiding human development on a changing planet. *Science* **347**(6223): 1259855.
- Sterman JD. 2015. Stumbling towards sustainability: why organizational learning and radical innovation are necessary to build a more sustainable world—But not sufficient. In *Leading Sustainable Change*, Henderson R, Tushman M *et al.* (eds). Oxford University Press: Oxford, UK; 51–80.
- Stratton M. 2020. Carbon-free Copenhagen: how the Danish capital is setting a green standard for cities worldwide. *National Geographic*, March. Retrieved 20 May 2023. Available from <https://www.nationalgeographic.co.uk/travel/2020/03/carbon-free-copenhagen-how-danish-capital-setting-green-standard-cities-worldwide>.
- Struben J, Lee BH, Bingham CB. 2020. Collective action problems and resource allocation during market formation. *Strategy Science* **5**(3): 245–270.
- Symons A 2023. From Train Guard to Ceo: meet the Dutchman Who Crowdfunded Night Train Start-up European Sleeper Euronews. Retrieved 14 June 2023. Available from <https://www.euronews.com/travel/2023/05/20/from-train-guard-to-ceo-meet-the-dutchman-who-crowdfunded-night-train-start-up-european-sl>.
- Taifun-Tofu 2022. About Us: the History of Taifun-Tofu Taifun Tofu. Retrieved 15 March 2022. Available from: <https://www.taifun-tofu.de/en/about-us/the-history-of-taifun-tofu>.
- Teece DJ, Pisano G, Shuen A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal* **18**(7): 509–533.
- United Nations Global Compact, A Strategy 2015. The United Nations Global Compact-Accenture Ceo Study: special Edition: a Call to Climate Action. United Nations Global Compact, New York City. Retrieved 15 March 2020. Available from: https://www.unglobalcompact.org/docs/issues_doc/Environment/climate/UN-Global-Compact-Accenture-CEO-Study-A-Call-to-Climate-Action-Full.pdf.