


A transitions framework for circular business models

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Editor Managing Review: Xin Tong

Abstract

The concepts “circular business models” and “transitions towards a circular economy” have become modern-day buzzwords. Yet, an understanding of the interplay between these two concepts remains unclear. This paper proposes a conceptual framework that illustrates the innovation mechanisms enhancing circular business models emerging within the context of transitions towards a circular economy. The paper follows a two-step methodology. First, a theoretical framing is proposed by adopting insights from transitions studies. Second, a systematic literature review is employed. The review synthesizes the selected literature tracing the proposed framing in the previously published research. Finally, a transitions framework for circular business models is proposed. This framework suggests future lines of research to support its plausibility. Moreover, it offers prescriptive help to managers, entrepreneurs, policymakers, and other social actors enabling them to make informed decisions about and take innovative actions for circular business models in specific contexts.

KEYWORDS

business model innovation, circular business model, circular economy, industrial ecology, sustainability transitions, systematic literature review

1 | INTRODUCTION

This paper contributes to the conceptual understanding of the emergence of circular business models within transitions towards a circular economy. It links circular business model innovation research (Linder & Williander, 2017) to the literature on transitions studies (Köhler et al., 2019). Previous research has highlighted the need for new, innovative, circular business models to enable a more circular economy (Geissdoerfer et al., 2018; Nußholz, 2017). The core of the argument is based on the idea that new circular business models are necessary for the transition from the dominating linear routines of production and consumption into circular ones (Bocken et al., 2016). Consequently, business model innovation is increasingly seen as an essential process for this transition (Planing, 2018; Sarasini & Linder, 2018). Yet, the existing literature provides limited conceptual tools for understanding the intricate interactions between circular business models and transitions towards a circular economy (Lewandowski, 2016; Pieroni et al., 2019). Many questions remain unanswered: How do circular business models emerge? How does circular business model innovation take place? Which are the underlying mechanisms behind this kind of process? How do structural components of the broader circular economy context relate to the emergence of circular business models? And how do circular business models and transitions towards a circular economy interact?

Insights from transition studies can be particularly helpful to address this line of questioning. Building on evolutionary economics and social constructivist accounts of innovation and technology, transition studies address the dynamics and evolutionary development of socio-technical

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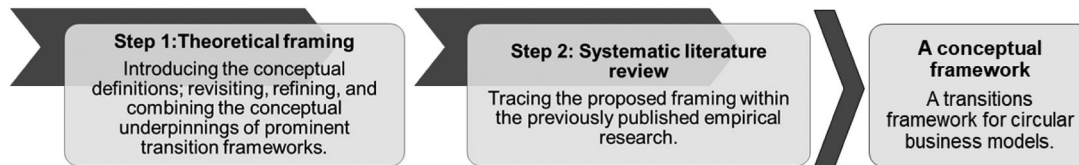


FIGURE 1 Two-step methodology of the conceptualization

transitions towards more sustainable modes of production and consumption (Köhler et al., 2019; Markard et al., 2012). Transition frameworks focus on understanding and explaining social, technological, and institutional changes brought by systemic innovation processes of novelties, for example, technologies, products, services, and business models (Farla et al., 2012; Truffer & Coenen, 2012). Recently, the links between business model innovation research and transitions studies have been acknowledged (Bidmon & Knab, 2018; Bolton & Hannon, 2016; Engwall et al., 2021). Many of these studies address the interrelations between emerging and existing business models and existing socio-technical systems (Sarasini & Linder, 2018; Tongur & Engwall, 2014; van Waes et al., 2018), and some use concepts such as “experimentation” and “resource mobilization” from the transitions field to understand the dynamics of business model innovation (Bocken et al., 2018; Konietzko et al., 2020).

However, there is still only limited understanding of the interplay between the circular business models and the transitions towards a circular economy. There is a need for more attention to the emergence mechanisms of circular business models and to the contextual components that relate to these mechanisms. Against this background, this paper aims to conceptualize how circular business models emerge in the context of transitions towards a circular economy. To do so, the paper applies a two-step methodology. In the first step a theoretical framing is introduced. The literature on circular economy and circular business models is scrutinized to introduce the definitions of the core concepts of circularity: “circular economy,” “circular business models,” and “circular business model innovation.” Further, the paper proposes a deductive framing that revisits, refines, and—where relevant—combines conceptual underpinnings of prominent transition frameworks. In the second step, the proposed framing is traced within the previously published empirical research by employing a systematic literature review. The combination of these two steps leads to a conceptual framework (see Figure 1).

By introducing the framework, the paper makes the following contributions. First, it contributes to recent research on business models by explicitly linking the subject to transition studies, with a particular emphasis on circular business models and circular economy. Second, it adds to the unpacking of the black box of transitions towards a circular economy by proposing a set of four contextual structural components—namely social actors, networks, technology and infrastructure, and institutions.¹ Third, it proposes an assemblage of seven innovation mechanisms, namely experimentation, visioning, network-building, learning, protection, resource mobilization, and legitimation. Understanding how these mechanisms enhance the emergence and development of circular business models is vital to support the transitions towards a circular economy.

The rest of the paper is structured as follows. Section 2 presents the approach and contours of the deductive theoretical framing. Section 3 describes the systematic literature review procedures and reports on the results of this review along with its limitations. Section 4 proposes a conceptual framework combining the deductive framing and systematic literature review. Finally, Section 5 concludes the paper by presenting managerial implications.

2 | THEORETICAL FRAMING

2.1 | Circular economy, business models, and innovation

The idea of circular economy proposes alternative economic activities that are shaped by, and shape, social structures and processes at different levels (Ghisellini et al., 2016; Henry et al., 2020; Laurenti et al., 2018). Although there is no commonly agreed-upon understanding of an exact typology of circularity strategies (Geissdoerfer et al., 2017; King et al., 2005), most scholars are in agreement over the “R-principles”: Refuse, Rethink, Reduce, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover (Kirchherr et al., 2017; Potting et al., 2017; van Buren et al., 2016). An emerging body of literature emphasizes the importance of circular business models as enablers of these circularity strategies (Lewandowski, 2016; Lieder & Rashid, 2016), and identifies business model innovation as essential for a transition towards a circular economy (Sarasini & Linder, 2018; Veleva & Bodkin, 2018). The basic idea is that innovative processes leading to circular business models are crucial for the successful transformation of the established linear processes of production and consumption into new circular loops.

There is growing consensus among scholars that a *circular business model* can be defined as a business model configuration that embeds circularity strategies into their value (re)creation and (re)delivery, value (re)capture, and (extended) value proposition (Geissdoerfer et al., 2018; Manninen et al., 2018). The idea is to maximize resource efficiency through sustaining the value of products and components by closing, intensifying, slowing, dematerializing, and narrowing resource loops by adopting different circularity strategies at the firm or industry levels (Nußholz, 2018).

Innovating novel business models, as well as reconfiguring existing ones, constitute core processes that underpin emerging circular business models (Tukker, 2015). Thus, *circular business model innovation* can be defined as the process of making changes to existing business models in order to develop (more) circular configurations that would (re)create, (re)deliver, and (re)capture value; or as the process of crafting entirely new circular business models to create, deliver, and capture value in novel ways (Guldmann & Huulgaard, 2020). Against this background, it is argued that circular business models can emerge through three types of business model innovation (Bocken et al., 2016; Nußholz, 2017; Planing, 2018):

- Type 1: Making changes to the existing linear business models to include circularity strategies that would (re)create, (re)deliver, and (re)capture value;
- Type 2: Making changes to the existing circular business models to strengthen circularity strategies that (re)create, (re)deliver, and (re)capture value;
- Type 3: Crafting a new business model based on circularity strategies from scratch to create, deliver, and capture value in novel ways.

2.2 | A transitions perspective on circular business models

In the growing field of transitions studies, much attention is given to understanding how major transitions of socio-technical systems unfold over time through innovations that shape and are shaped by structural components by means of various innovation system dynamics (Farla et al., 2012; Truffer & Coenen, 2012). Technological Innovation Systems (TIS) (Bergek, Jacobsson, Carlsson, et al., 2008) and Strategic Niche Management (SNM) (Schot & Geels, 2008) are two of the most significant frameworks in this research. While TIS addresses structures and functions that influence the success or failure of emerging novelties in a system (Bergek, Jacobsson, Carlsson, et al., 2008; Hekkert et al., 2007), SNM emphasizes how niche-building processes together with shielding mechanisms can drive the success of the emerging novelties through continuous experimentation in protected spaces (Smith & Raven, 2012; van der Laak et al., 2007).

In the TIS approach, the structural elements of the system are actors, networks, and institutions. The development, diffusion, and use of a novelty result from the fulfillment of a set of system functions—namely, entrepreneurial activities, knowledge development, knowledge diffusion, search guidance, market formation, resource mobilization, and legitimacy creation (Bergek, Jacobsson, Carlsson, et al., 2008; Carlsson & Stankiewicz, 1991; Hekkert et al., 2007). Whereas SNM introduces three niche-building processes for the development and adoption of novelties by means of real-life experiments, namely the articulation of expectations and visions, network building, and learning (Kemp et al., 1998; Schot & Geels, 2008). These frameworks are complementary to each other and provide theoretical grounds for understanding how innovations drive and emerge within the context of socio-technical transitions. Drawing on these frameworks, key contextual features and innovation mechanisms that enhance circular business models are identified and conceptualized.

Circular business models do not emerge in isolation. Since transitions towards a circular economy require social, technological, and institutional changes in the contexts of linear models, the conceptualization is proposed to include a set of four structural components—“social actors,” “networks,” “technology and infrastructure,” and “institutions”—as well as an assemblage of the seven innovation mechanisms “experimentation,” “visioning,” “network-building,” “learning,” “protection,” “resource mobilization,” and “legitimation.” These concepts are largely consistent with what the TIS and SNM frameworks propose as socio-technical system structures, functions, and niche-building processes. The details of the theoretical grounding, as well as the proposed definitions and specifics of the concepts, are given in Table 1. It is worth noting that the conceptualization approach involves a reorientation rather than reinvention.²

3 | SYSTEMATIC LITERATURE REVIEW

This paper carries out a systematic literature review to trace the proposed concepts within the previously published research (Fink, 1998; Fischl et al., 2014; Susur et al., 2019). A literature search in the Scopus database was done to systematically review the body of knowledge with respect to “circular,” “business model,” and “innovation” related publications to capture the literature on circular business models and circular business model innovation.³ Specific keywords for “circular economy” and “transitions” were not included in the search string as the trials showed such a combination did not lead to any additional significant sets of publications. The selected keywords, however, enabled the capture of potentially relevant literature in which the focus on transitions towards a circular economy was not explicit in the title, abstract, or keywords but was treated in the main body of the article.

Scopus was selected as the source database because it provides a more comprehensive abstract and citation database of research literature and quality web sources than other quality web sources, such as Web of Science. The search results yielded 222 articles. To identify the most relevant literature, abstracts, titles, and keywords were carefully reviewed and the final selection included 177 articles, that is, those on comparing the environmental performance of business models, quantifying inter-organizational resource and by-product exchanges, the role of eco-innovation in the circular economy, waste minimization, life cycle assessment, etc., were excluded. Although the literature search string did not include any

TABLE 1 Deductive conceptualization of structural components and innovation mechanisms

Proposed concepts	Theoretical grounding in the TIS and SNM frameworks, proposed definitions, and specifics
Social actors	<p>TIS—Actors (Bergek, Jacobsson, Carlsson, et al., 2008): Include the firms in the value chain, knowledge organizations, public bodies, non-profit interest organizations, intermediaries, banks, and venture capitalists.</p> <p>SNM—Social actors are not explicitly included in the framework per se, yet the niche-building and protection processes are largely explained in relation to various actors that influence these processes (Borghei & Magnusson, 2018; Schot & Geels, 2008; Weber et al., 1999).</p> <p><i>Proposed definition and specifics: All human-related actors that have agency in the context of transitions, influencing the emerging circular business models under analysis. These include organizations distributed along the focal firm's or industry's value chain, as well as universities and research centers, governmental and non-governmental organizations, intermediaries, industry associations, and financiers.</i></p>
Networks	<p>TIS—Networks (Bergek, Jacobsson, Carlsson, et al., 2008; Carlsson & Stankiewicz, 1991; Hekkert et al., 2007; Musiolik & Markard, 2011): Include formal and informal networks in orchestrated or self-evolving ways, for example, advocacy coalitions, technology platforms, public–private partnerships, university–industry connections, social communities, and joint-ventures.</p> <p>SNM—Networks are not explicitly included in the framework per se, but network-building is incorporated as one of the niche-building processes employed by the actors of the focal socio-technical system (Schot & Geels, 2008; Geels & Raven, 2006).</p> <p><i>Proposed definition and specifics: Collective entities of relevant social actors, which are involved in, or related to, the innovation mechanisms of the circular business models under analysis. These may include the networks that the focal firm is embedded in, for example, strategic alliances, platforms, and project networks, or—if the focus is on the industry level—network concept then refers to the collective entities forming the structure of the focal industry, as well as the ones surrounding it, for example, regional/national networks, political networks, technical committees. The collective entities related to other novel business models that influence the focal circular business model can also be relevant to consider.</i></p>
Technology and infrastructure	<p>TIS and SNM—The empirical and analytical focus of the frameworks is primarily on the change brought about by novel technologies and emerging infrastructures (Bergek, Jacobsson, Carlsson, et al., 2008; Bergek, Jacobsson, & Sandén, 2008; Hekkert et al., 2007; Schot & Geels, 2008; Smith & Raven, 2012). However, neither the technology nor the infrastructure is explicitly included in the frameworks as a socio-technical system structure.</p> <p><i>Proposed definition and specifics: Non-human tangible factors underlying the transitions in which the focal circular business model is embedded. The technology includes the related artifacts and knowledge needed and available for the emergence of the focal circular business model. The supporting infrastructures are crucial elements for the success of technology in terms of its diffusion and ultimate adoption.</i></p>
Institutions	<p>TIS—Institutions (Bergek et al., 2008a, 2008b; Hekkert et al., 2007): Include formal rules like regulations and laws executed by juridical systems, as well as norms, culture, and cognitive rules held by social systems and which influence decisions and actions through routines. Regulatory rules confer directives, incentives, policies, laws, property rights, contracts, tax structures, sanctions, legal systems, etc., and are performed through coercive mechanisms. Normative rules refer to values, norms, expectations, rights, responsibilities, privileges, duties, mandates, etc., and are performed through normative mechanisms. Finally, cognitive rules concern beliefs, priorities, interests, and thinking frames and societal systems take them for granted without questioning through mimetic mechanisms.</p> <p><i>Proposed definition and specifics: Established routines that are dispersed within the social context influencing the circular business models under analysis. The routines are considered as representations of underlying shared regulatory, normative, and cognitive rules.</i></p>
Experimentation	<p>TIS—Entrepreneurial activities (Hekkert & Negro, 2009; Hekkert et al., 2007), entrepreneurial experimentation (Bergek, Jacobsson, Carlsson, et al., 2008): Activities to generate, test, and realize novel opportunities using the potential of knowledge, networks, and markets by either the new entrants or the incumbents.</p> <p>SNM—The building of socio-technical niches (Schot & Geels, 2008; van der Laak et al., 2007): Processes to create protected spaces that allow the nurturing and experimenting with the novelties co-evolving with the user practices and regulatory structures.</p> <p><i>Proposed definition and specifics: Generation, testing, and implementation of circular business model innovation to develop and nurture the circular business model under analysis. The context in which the focal circular business models are embedded is the experimentation setting, as the transitions towards a circular economy are still under making, combating well-established linear economy routines.</i></p>
Visioning	<p>TIS—Guidance of search (Hekkert & Negro, 2009; Hekkert et al., 2007), influence on the direction of search (Bergek, Jacobsson, Carlsson, et al., 2008): Activities to influence and attract further attention and investments for the novelties.</p> <p>SNM—Articulation of expectations and visions (Caniëls & Romijn, 2008; Schot & Geels, 2008; van der Laak et al., 2007): Processes to provide direction to unfolding novelties, invite interest and legitimate protection around novelties.</p> <p><i>Proposed definition and specifics: Identifying and understanding the existing problems and gaps, based on past experiences, present activities, and future expectations. Through visioning, social actors and networks can formulate solutions and strategies, set common goals, and articulate their expectations and demands as specifically as possible. Visioning in the short term can create the momentum required to experiment with novel circular business models, and in the long term can bring the required momentum to change the established linear economy routines.</i></p>

(Continues)

TABLE 1 (Continued)

Proposed concepts	Theoretical grounding in the TIS and SNM frameworks, proposed definitions, and specifics
Network-building	<p>TIS—Networks (Hekkert et al., 2007; Musiolik & Markard, 2011): Network-building is not included as a system function, but networks are incorporated into the framework as one of the structural components of the socio-technical systems, as stated previously.</p> <p>SNM—Building of social networks (Caniëls & Romijn, 2008; Schot & Geels, 2008; van der Laak et al., 2007): Processes to build and facilitate deep interactions between a broad range of stakeholders that mobilize commitment and necessary resources for development, diffusion, and adoption of the novelties.</p> <p><i>Proposed definition and specifics: Strategic building of social networks, aiming at mutual resource exchanges among social actors relevant to the circular business model under analysis. It can foster continuous interaction between the main actors relevant to the focal circular business model and strengthen the entry of new actors. It aims at building broad and deep networks, that is, a broad range of social actors mobilizing commitment and resources.</i></p>
Learning	<p>TIS—Knowledge development, knowledge diffusion through networks (Hekkert & Negro, 2009; Hekkert et al., 2007), knowledge development and diffusion (Bergek, Jacobsson, Carlsson, et al., 2008; Carlsson & Stankiewicz, 1991): Knowledge-related activities to create and exchange information through processes of learning by searching, doing, interacting, and using in networks.</p> <p>SNM—Learning (Caniëls & Romijn, 2008; Schot & Geels, 2008; van der Laak et al., 2007): Processes to accumulate information among the stakeholders and to enable changes in the cultural–cognitive frames and assumptions. Learning consists of two levels. First-order learning refers to the exposure to an initial understanding of information, facts, and data. Second-order learning entails cognitive digestion of the exposed information, facts, and data through questioning the underlying assumptions.</p> <p><i>Proposed definition and specifics: Searching, doing, using, and interacting based on knowledge development, diffusion, and integration related to the circular business model under analysis. The relevant social actors and networks can exchange insights on existing business models, technologies, infrastructures, and institutions through the first-order and second-order learning processes.</i></p>
Protection	<p>TIS—Market formation (Bergek, Jacobsson, Carlsson, et al., 2008; Hekkert & Negro, 2009; Hekkert et al., 2007): Activities to create demand and protection provision for the novelties.</p> <p>SNM—Articulation of expectations and visions (Schot & Geels, 2008; Schot et al., 1994), protection (Smith & Raven, 2012): Processes to legitimize continuous shielding, nurturing, and empowering the emerging novelties.</p> <p><i>Proposed definition and specifics: Strategic creation of protective spaces and holding off selection pressures in ways favorable for development, diffusion, and adoption of circular business models; or making circular business models competitive within the unchanged selection environments.</i></p>
Resource mobilization	<p>TIS—Resource mobilization (Bergek, Jacobsson, Carlsson, et al., 2008; Hekkert et al., 2007): Activities to allocate necessary financial, competence/human, and complementary/material assets for development, diffusion, and adoption of the novelties.</p> <p><i>Proposed definition and specifics: Mobilization and allocation of financial, human, and complementary resources by varying actors and networks for development, diffusion, and adoption of emerging or established circular business models under analysis. Financial resources refer to available funds for different programs to develop, implement, and provide the relevant knowledge, technology, and infrastructure. Human resources refer to the developed competence through education in different fields aiming to further circular economy thinking within different segments of society. Finally, complementary resources refer to services, and goods provided to foster the circular business model innovation.</i></p>
Legitimation	<p>TIS—Creation of legitimacy (Hekkert & Negro, 2009; Hekkert et al., 2007), Legitimation (Bergek, Jacobsson, Carlsson, et al., 2008): Activities to contribute to social acceptance of the novelties and their compliance with relevant institutions by mitigating resistance to change.</p> <p><i>Proposed definition and specifics: Continuous contribution to social acceptance of the circular business model and its compliance with relevant institutions, established rules, and routines. In practical terms, advocacy coalitions, manipulative strategies, and active lobbying are particularly functional for legitimation activities.</i></p>

exclusion criteria related to the publication time of the studies, the articles identified were published between January 2014 and April 2022. This indicates that circular business model studies constitute an emerging research field.

In the next step, a keyword analysis was executed to better understand the contextual meanings of the articles in terms of research foci and areas. The 160 identified keywords of the articles were screened, and articles containing “circular,” “business model,” or “innovation” were grouped into the corresponding three clusters: (i) circular, (ii) business model, and (iii) innovation, respectively (see Figure 2). The frequencies of occurrence of the keywords included in these clusters have been listed as well. Subsets have been identified at the intersections of the clusters. The frequencies of occurrence of the keywords included in those subsets reveal that “circular economy” and “circularity” have in general been fruitfully integrated into business model literature, and the same may be said about the innovation concept. However, “circular business model innovation” is still in its infancy and is often studied without being explicitly named.

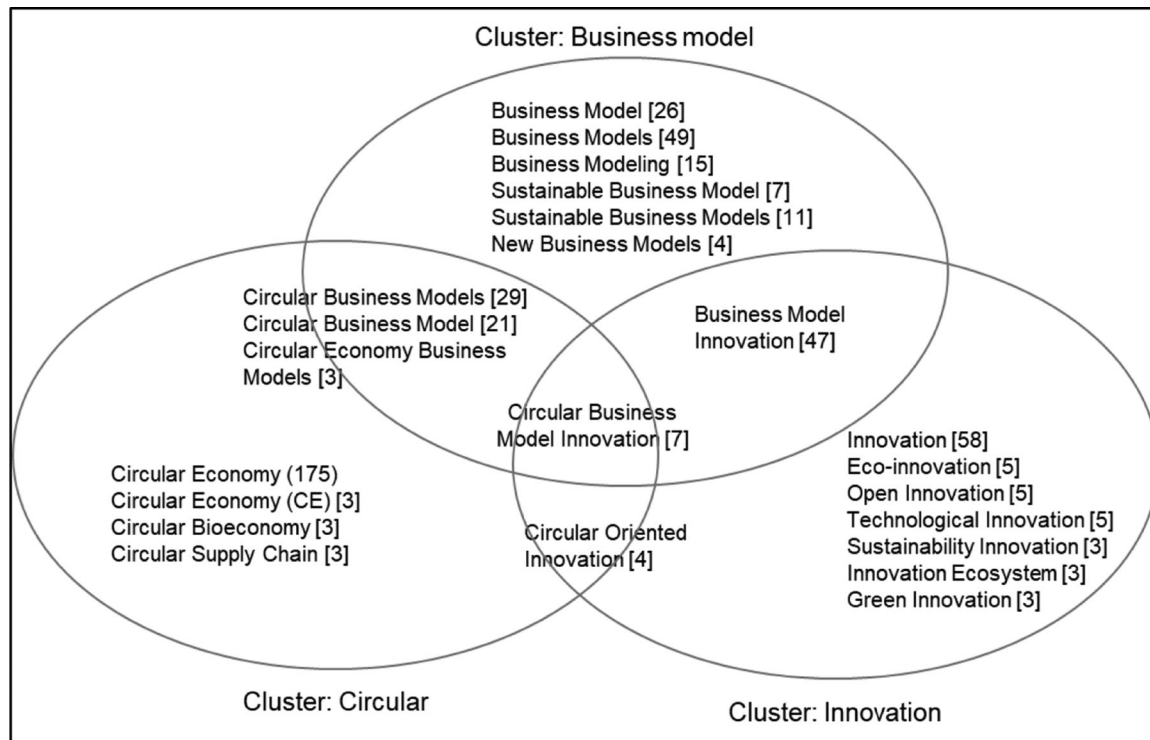


FIGURE 2 Clusters of the frequency of occurrence of keywords including “circular,” “business model,” or “innovation”

After the keyword analysis, further screening based on the number of citations per year was done to identify the most cited articles. This led to a final selection of 57 articles, which all had received more than 10 citations per year. In a final step, the references in these 57 articles were also screened, and this identified a further 7 articles to be included in the sample. The result was a final set of 64 articles that were extensively reviewed based on the structural components and innovation mechanisms identified above (see [Supporting Information](#) for the full list of these articles). All steps of the systematic literature review are illustrated in Figure 3.

However, it is worth noting some limitations. The current review is based on journal articles from the Scopus database, which has a broad, heterogeneous, and trustworthy coverage of studies. Yet, there are also other databases available (such as Web of Science and Google Scholar) and this may have led to some literature being missed. Additionally, adopting strict criteria for article inclusion during the screening process may have limited the results. Thus, even though the results of this study are valid, they may not cover the complete available body of knowledge related to circular business models and circular business model innovation.

3.1 | Structural components related to circular business model innovation

This section presents how the proposed structural components of transitions are reflected within the selected articles on circular business model innovation.

3.1.1 | Social actors

In the selected articles, the transition towards a circular economy is approached as a complex process that requires active participation by various actors, such as governmental organizations, universities and research centers, firms, customers, and users. Firms are given particular importance. Scholars explore a wide variety of firms, addressing how different firm characteristics, such as sector (Heyes et al., 2018; Sousa-Zomer et al., 2018), size (D'Amato et al., 2020), market-entry stage (Henry et al., 2020), organizational capabilities (Gusmerotti et al., 2019; Näyhä, 2020; Weissbrod & Bocken, 2017), and organizational strategy and culture (Lopez et al., 2019; Tura et al., 2019) influence firms' innovation, as well as the adoption of circular business models.

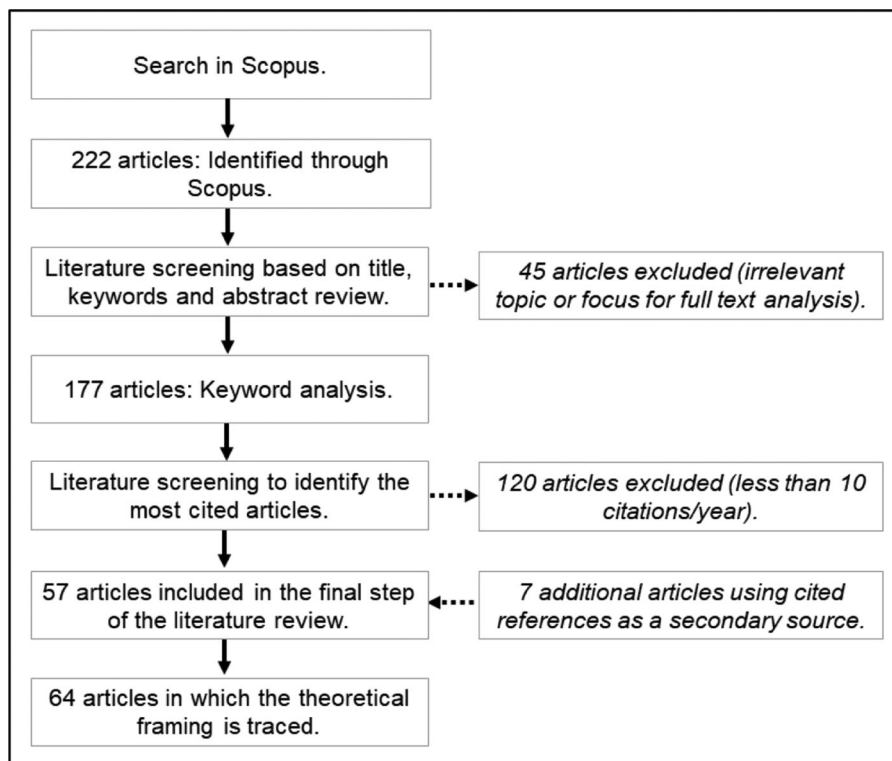


FIGURE 3 Systemic literature review steps

3.1.2 | Networks

Among the selected articles, the network component is viewed from a multi-actor and multi-innovation perspective (Nußholz, 2017). The included articles examine circular business models from the perspectives of the resource flows among different actors (Zucchella & Previtali, 2019), network transformation through orchestration, entrepreneurial partnership, cooperation and collaboration (Näyhä, 2020; Rossi et al., 2020), co-utilization of resources and capabilities of different actors, and the facilitating role of particular actors, such as governments and entrepreneurs (Goyal et al., 2018). The studies focus on the networks that the focal firm is embedded in, as well as the ecosystems composed of the entities in the firm's value chain (Asgari & Asgari, 2021; Chen et al., 2020). Mutual resource exchanges are given particular importance by adopting a supply/value chain perspective (Geissdoerfer et al., 2018; Nußholz, 2018; Yang et al., 2018). Moreover, the potential challenges to network formation are explained based on conflicting interests among the actors and on issues related to lack of transparency (Rizos et al., 2016; Tura et al., 2019). In addition, the scholars indicate digitalization, Industry 4.0., and servitization as the most relevant current trends interacting with transitions towards a circular economy (D'Amato et al., 2020; Garcia-Muiña et al., 2019; Parida & Wincent, 2019). The business models reflected in these trends, particularly with respect to product–service systems, come to the forefront when their circularity contributions to the supply/value chains are discussed (Centobelli et al., 2020; Hofmann, 2019).

3.1.3 | Technology and infrastructure

Both concepts are considered in the selected articles. On the one hand, business model innovation is considered a driving force for the co-evolution of technology and infrastructure (Sarasini & Linder, 2018). On the other hand, and more commonly, technology and infrastructure are considered a prerequisite for the creation and scale-up of circular business models (Lopez et al., 2019; Näyhä, 2020; Weissbrod & Bocken, 2017). These studies signal the importance of technology and infrastructure for collecting, sharing, utilizing, and managing information in transitions towards functioning circular business models (Garcia-Muiña et al., 2019; Tura et al., 2019). Finally, employing a co-evolutionary perspective, most articles consider technology and infrastructure as parts of emerging circular business models (Hofmann, 2019).

3.1.4 | Institutions

The review shows that regulatory, normative, and cognitive rules are included, especially when elaborating on the potential barriers and drivers to transitions (Gusmerotti et al., 2019; Sarasini & Linder, 2018; Tura et al., 2019). Among the problems related to regulatory rules are, for instance, blurry political strategies without clear definitions and priorities (Leipold & Petit-Boix, 2018), regulatory approaches missing sustainability orientation (Guldmann & Huulgaard, 2020), overly emphasized market competition (Rizos et al., 2016), and lack of supportive taxation policies and fiscal measures (Linder & Williander, 2017; Lopez et al., 2019; Sousa-Zomer et al., 2018). The normative and cognitive rules are generally addressed in terms of the cultural routines of the consumers and firms. Consumption-related rules, which act as drivers, are explained by changing consumer behaviors toward environmentally friendly products (Paletta et al., 2019), and consumer awareness of product externalities (Rizos et al., 2016). Moreover, the articles discuss the importance of believing in circular business models as a part of the organizational culture (Näyhä, 2020), and understanding consumer behaviors behind the acceptance or rejection of particular products (Rizos et al., 2016).

3.2 | Innovation mechanisms enhancing circular business models

This section presents how the proposed innovation mechanisms enhancing circular business models are reflected within the systematically selected articles.

3.2.1 | Experimentation

In the literature, experimentation is primarily discussed in relation to the visioning and learning of firms in different contexts of transitions towards a circular economy. For example, the importance of developing proper tools and methods for experimenting is particularly underlined (Bocken et al., 2021; Weissbrod & Bocken, 2017). Some scholars highlight the need to maintain stability in the current market practices while a firm experiments reorienting its future businesses towards more circular routines. The literature suggests that continuous experimentation based on long-term visions can inform the strategic governance of transitions towards a circular economy (Tura & Ahola, 2019). And, this, in turn, can successfully bring alternative business models to market (Sarasini & Linder, 2018). Experimentation can help in understanding the circumstances for developing a novel circular business model that can take advantage of available windows of opportunity in the market.

3.2.2 | Visioning

The literature discusses the visioning process primarily in relation to experimentation and resource mobilization. The importance of having a long-term overarching vision with clear goals concerning a circular economy, and the need to consider the drivers for, and constraints of building a circular future is highlighted (Mendoza et al., 2017). Strategic leadership by environmentally conscious leaders can be particularly helpful in setting directions towards the overarching visions (Gusmerotti et al., 2019; Sousa-Zomer et al., 2018). Moreover, the literature indicates that proper problem definition, increasing awareness of sustainability problems, and a common understanding of circular business models as promising solutions are crucial. Visioning can break the resistance to change amongst different actors and networks, and make them mobilize required resources (Leising et al., 2018; Manninen et al., 2018). Thus, a long-term vision based on past experience as well as the present situation can be reflected in actions that create the momentum required to continuously experiment with novel circular business models (Heyes et al., 2018). Thus, visioning can, according to the literature, clarify vague ideas about developing and adopting circular business models.

3.2.3 | Network-building

The selected articles relate network-building to experimentation, visioning, resource mobilization, and legitimation mechanisms. They address the network-building activities while discussing collaboration, cooperation, coordination, communication, orchestration, ecosystem-building, relationships, partnerships, and stakeholder involvement. Scholars argue for the need for exploring internal collaboration within the firms, as well as for developing external collaborations with different actors (Leising et al., 2018). Among the actors indicated, suppliers and customers/users are highlighted as critical partners for a firm's successful experimentation with circular business models (D'Amato et al., 2020). In these collaborations, transparency is particularly important to creating shared visions and values (Hofmann, 2019). However, tight strategic collaboration may also result in too strong interdependencies which can lead to uncertainty and vulnerability of the involved actors (Hofmann, 2019). Finally, the literature iden-

tifies lack of time, knowledge, and competencies as well as lack of mutual trust among actors as the main challenges to network-building for circular business model innovation (Guldmann & Huulgaard, 2020).

3.2.4 | Learning

In the selected articles, learning is discussed primarily in relation to experimentation, visioning, and network-building mechanisms. The scholars extensively discuss the shifts in problem framing and solving among different actors during experimentation (Leising et al., 2018); the importance of both deliberate and unplanned action-based learning (Weissbrod & Bocken, 2017), and knowledge exchange based on communication flows (Rizos et al., 2016). Due to their typical lack of resources, the significance of the knowledge transfer available to smaller firms is specifically underlined (Näyhä, 2020). Customers/users constitute an actor group that is paid particular attention to; if they lack knowledge related to the circular economy it is less likely that they will become engaged in experimenting with goods and services produced using circular business models (Lopez et al., 2019). In addition, the literature suggests that different learning tools, such as training, guidelines, seminars, workshops, advertisements, and other events are vitally needed (Guldmann & Huulgaard, 2020). However, in the analyzed articles there is no explicit differentiation between the first-order and second-order learning processes.

3.2.5 | Protection

The protection mechanism is commonly discussed in relation to experimentation with circular business model innovation. Initial investment costs and a lack of financial resources, together with insecure revenue streams are commonly indicated as primary impediments to experimentation, particularly among small- and medium-sized firms (D'Amato et al., 2020; Näyhä, 2020). Moreover, some firms fear that adopting circularity strategies in their business models would negatively affect their sales of new products (Sousa-Zomer et al., 2018). Furthermore, the literature indicates a need for building strategies through the involvement of multiple actors and networks for changing unfavorable market conditions, creating market opportunities, and ensuring market viability (Jensen et al., 2019; Lopez et al., 2019). Some examples of shielding, nurturing, and empowerment strategies discussed in the literature are provisioning of financial support to new products (Nußholz et al., 2019), holding off selection pressures by introducing variance to dominant economic indicators in the existing markets (Gusmerotti et al., 2019), and reconstructing the existing market rules towards a more responsible consumption culture (Hopkinson et al., 2018). Through these continuous negotiation processes of political nature, firms can be motivated to get involved in circular business model innovation.

3.2.6 | Resource mobilization

The literature discusses resource mobilization primarily in relation to experimentation, protection, and legitimization mechanisms. Scholars argue for the need to mobilize financial and human resources not only during early-stage experimentation activities to calm firms from suffering from initial financial barriers, but also during follow-up activities after experimentation to contribute to the legitimization of the circular economy thinking among social actors. Considering complementary resources, circular business model innovation can be strategically supported through the commercialization of different technologies (Sarasini & Linder, 2018). Finally, systematic mobilization of human resources at broader scales for experimenting with circular business models as a part of local development is discussed as a strategy for developing economies (Goyal et al., 2018).

3.2.7 | Legitimation

The legitimation mechanism is not explicitly considered in the analyzed literature, yet some relevant concepts are discussed in relation to experimentation and protection mechanisms. The literature generally addresses barriers to the legitimization of circularity strategies primarily associated with established rules, such as the lack of effective regulations enhancing circular production and consumption patterns (Guldmann & Huulgaard, 2020), as well as values and attitudes embedded in the production and consumption cultures (Lopez et al., 2019). These established rules usually weaken the socio-institutional embeddedness of circular business model innovation (Henry et al., 2020). To accelerate the legitimation process, scholars highlight the importance of adopting strategic governance and leadership at both national and international levels (Tura et al., 2019), designing and applying regulatory pressures (Gusmerotti et al., 2019), and developing relevant risk assessment and management tools for firms (Guldmann & Huulgaard, 2020).

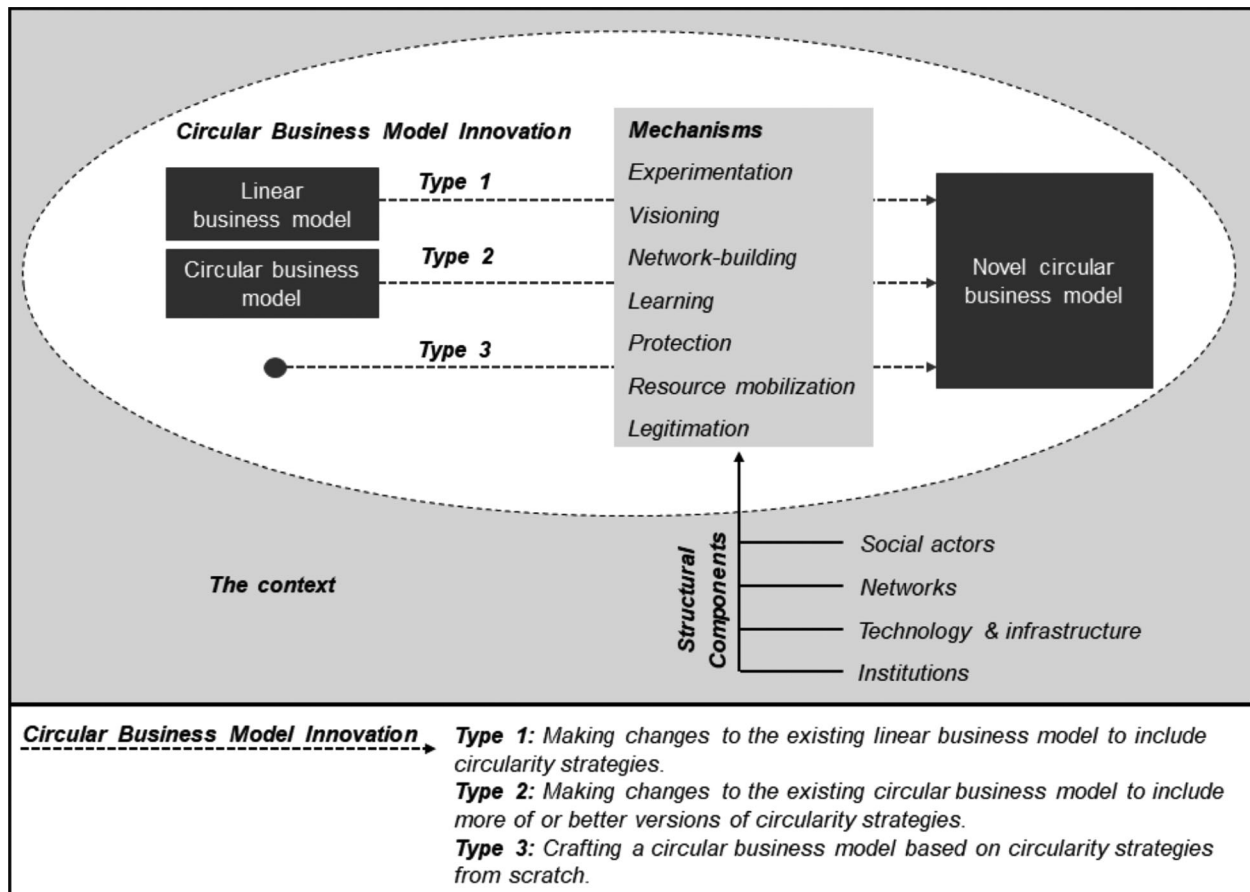


FIGURE 4 A transitions framework for circular business models

4 | TOWARDS A CONCEPTUAL FRAMEWORK

The literature review shows that different aspects of the proposed theoretical framing have been largely considered in the published research, although not always explicitly. Yet, it is evident that circular business models are most often studied and operationalized at the firm level, and studies at the industry and systems levels remain limited. Moreover, in the covered studies there is no evidence of a systemic perspective on circular business model innovation focusing on various social actors and their interactions. More specifically, the proposed four structural components are all addressed in previous research, yet separately and, at times, implicitly. In addition, the proposed seven innovation mechanisms have varying degrees of relevance. Taken together, this leads to a conceptual framework constituting a possible starting point for understanding the interplay between the emergence of circular business models and the transitions towards a circular economy (see Figure 4).

Additionally, the circular business model innovation mechanisms interact with each other in line with what TIS and SNM frameworks advocate for the innovation functions and niche-building processes (Bergek, Jacobsson, Carlsson, et al., 2008; Hekkert & Negro, 2009; Schot & Geels, 2008). The literature review findings reveal that all seven mechanisms are linked, either directly or through mediation, to each other. For instance, resource mobilization is discussed mainly in relation to experimentation, protection, and legitimization mechanisms, and experimentation is discussed mainly in relation to visioning and learning (see Figure 5 below for observing the relational details).⁴

It should be noted that the innovation mechanisms that matter most may differ from one case to another. Also, the structural components which influence these mechanisms may change from one case to another. Consequently, the proposed framework does not emphasize any component or mechanism over another, and neither does it argue that all these conceptual dimensions should be covered in all circular business model cases. They can be iteratively and selectively studied by researchers. Furthermore, they can be studied in relation to the three types of circular business model innovation. A more precise understanding can only be achieved through observations from empirical cases. However, the presented framework can hopefully inspire researchers to refine the proposed approach further (see also Jaakkola, 2020).

Finally, there might be some potential operationalization concerns when the proposed framework is adopted in future empirical studies. When empirically studying the interplay between the emerging circular business models and transitions towards a circular economy, it might not be feasible to start by mapping the structural components since the boundaries and contextual contents of the transitions are often blurred. For instance,

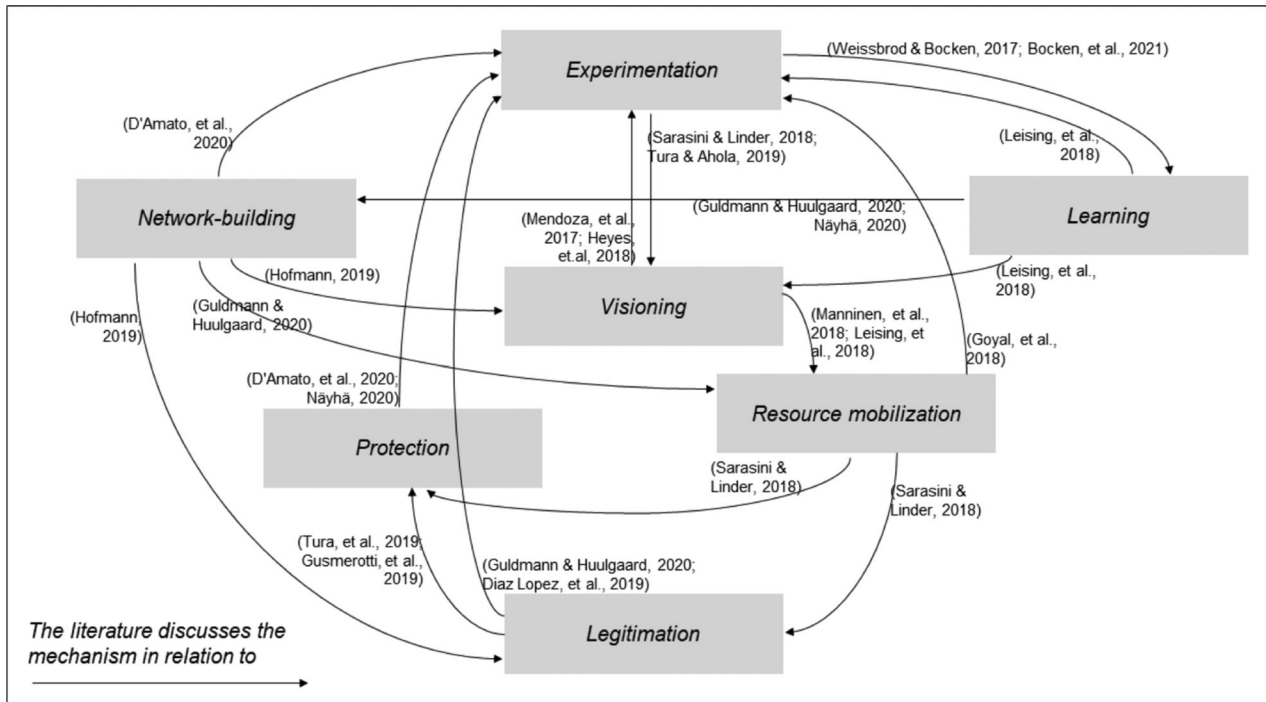


FIGURE 5 Interaction between innovation mechanisms

circular business models in one industry are likely to interact with other industries, and different circular business models, related to different industries, can be embedded in the same context of transitions. Therefore, it is recommended to begin by studying the emerging circular business model(s) and understanding relevant innovation mechanisms, and then demarcating the boundaries of the surrounding context and identifying its structural components. Naturally, the empirics will then further inform the analysis of the innovation mechanisms, and, considering the expected iterative and abductive nature of case research, revisiting these mechanisms will extend the understanding of the structural components (Dubois & Gadde, 2002, 2014).

5 | CONCLUSION AND IMPLICATIONS

This paper proposes a conceptual framework to illustrate how circular business models emerge through innovation mechanisms within transitions towards a circular economy. By doing so, it contributes a novel conceptual approach to the circular business model literature, as well as to transitions studies. The introduced framework, on the one hand suggests “social actors,” “networks,” “technology and infrastructure,” and “institutions” as four contextual structural components of the transitions. On the other hand, it offers seven mechanisms of circular business model innovation: “experimentation,” “visioning,” “network-building,” “learning,” “protection,” “resource mobilization,” and “legitimation.” The review results of the systematically selected articles demonstrate that the studies of circular business model innovation contribute to an emerging research field, and reveal the potential explanatory power and fruitfulness of the proposed conceptual understanding. Future research should explore and apply the framework in different contexts to improve the proposed approach and perhaps suggest an alternative one.

Finally, the paper also offers some management-oriented implications. Fundamentally, circular business model innovation can be deliberately facilitated by building on the proposed conceptualization. If the proposed framework is used as a prescriptive management tool, then related actors could govern the circular business model innovation by working on the seven innovation mechanisms. This governance would require careful consideration of the constantly changing technology and infrastructure, as well as of the established institutional structures. Consequently, using the framework as a managerial tool could enable actors to improve their decision-making processes for a further development, diffusion, and adoption of circular business models in specific contexts.

ACKNOWLEDGMENTS

The authors would like to thank anonymous reviewers of the 5th International Conference on New Business Models and the 82nd Annual Meeting of the Academy of Management for the insightful comments on earlier versions of this paper.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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NOTES

¹ Transitions towards a circular economy have been recently studied and framed from an evolutionary perspective building on a development block approach (Chizaryfard et al., 2020).

² See also (Jaakkola, 2020) for further alternative theoretical elaboration and synthesis approaches in conceptual papers.

³ The details of the search string is as follows: ((TITLE-ABS-KEY("circular*")) AND (TITLE-ABS-KEY("business model*")) AND (TITLE-ABS-KEY("innovat*"))) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ECON")). That is to say, three keywords have been included: circular*, business model*, and innovat*. The search was limited to "articles" in "English" language with "journals" as the selected source type. Finally, three most relevant subject areas were chosen as: (i) Business, Management and Accounting, (ii) Social Sciences, and (iii) Economics, Econometrics and Finance. The search date was April 29, 2022.

⁴ However, it is worthwhile to note that the literature reviewed did not analyze the totality of the proposed mechanisms.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Susur, E., & Engwall, M. (2023). A transitions framework for circular business models. *Journal of Industrial Ecology*, 27, 19–32. <https://doi.org/10.1111/jiec.13363>