Chapter 6
Theoretical Framework of Circular Business Model Innovation for Building Contractors

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Abstract The construction industry's traditional linear business models of "take, make, and dispose" are being challenged in practice due to the increased market demands and the political agenda that points towards sustainable and circular practices. The majority of existing research within sustainable and circular business models is limited to short-term consumer products, but the research is poorly matching the conditions of buildings as capital-intensive goods with significantly longer life cycles. The data collection builds on an integrative literature review that will synthesize current findings on sustainable and circular business models by assessing the four major business model dimensions of value proposition, value delivery, value creation, and value capture. The aim of this paper is to identify and discuss important shortcomings in the general framework of sustainable business models with regard to application in the construction and real estate sector and more specifically larger contractor firms. The main findings conclude there is a research gap in terms of developing new business models that both capture the distinctive characteristics of the construction industry and innovate building contractors' traditional practices towards the sustainable and circular transition. This paper points out that future circular business models of larger contractor firms will probably include elements of the business models "Orchestrator" and "inclusive value creation" due to the increased need for coordination and early project involvement with multiple stakeholders in the value chain for the co-creation of long-term and valuable partnering agreements as well as participation in new types of procurement.

Keywords Circular economy · Business model · Material flows · Innovation · Contractors

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6.1 Introduction

Sustainable development is accelerating in the Danish construction industry, and contractor firms are increasingly experiencing new sustainable market demands, which challenge their existing work processes and business models. In particular, the term circular economy has received significant attention as the new economic paradigm (Kirchherr et al., 2017), and the definition is according to the Ellen MacArthur Foundation (Webster, 2017): "A circular economy is one that is restorative by design, and which aims to keep products, components and materials at their highest utility and value, at all times." The work processes of waste management aiming at closing material loops and moving further up the waste hierarchy are traditionally not considered part of the contractor's role. Circular demolition and sourcing of materials could potentially be an integrated part of future building projects. Thus, the European Commission has launched a circular economy action plan and a recently updated EU Taxonomy report that include technical screening criteria within circular principles for real estate investments (European Commission, 2020). Nationally, the launch of the voluntary sustainability class in the Danish Building Regulations includes requirements within life-cycle analysis, resource consumption at the building site, and gradually increasing CO_2 limits for new buildings above 1000 m^2 will be implemented as mandatory from 2023 with the aim of reducing the CO_2 emissions from 12 to 7.5 kg CO_2eq/m^2/year in 2030 (Ministry of the Interior and Housing, 2021). The new political instruments are rapidly driving circular initiatives in the built environment and enable construction companies to rethink their current business models. In addition, the almost exponential growth in new DGNB certified projects is pushing for a sustainable transformation of Danish construction.

The research objective of this paper is to identify and discuss important shortcomings in the general framework of sustainable business models with regard to application in the construction and real estate sector. As a result, the paper will demonstrate the needed considerations and conditions that are applicable in the construction industry when innovating existing business model structures. The findings are followed by a discussion focusing on larger building contractors' possibility to engage in new types of sustainable business models. This research contributes to insights for developing new business models for the sustainable transformation in construction, which is an important step towards realizing the UN's Sustainable Development Goals (SDGs) of SDG 12 "Responsible consumption and production" and SDG target 17.17 "Encouraging effective partnerships" (United Nations, 2016).

6.2 Research Methodology

The preliminary data collection consists of an integrative literature review on traditional and sustainable business models by mapping and synthesizing the presented common ideas and concepts in the chosen individual papers (Torraco, 2016). Thus, the quality assessment involves a critical review on identifying the most general

Table 6.1 Data collection of the chosen studies

Category/similarities	Studies in total	Knowledge gap
Commonly used business models	3	The traditional business models do not include dimensions for circular economy thinking, e.g., end of life
Business models in construction	1	The business model archetypes for different roles in construction are only considering the present status
Sustainable and circular business models	6	Narrow focus on products and services with the aim of breaking shorter life cycles
Sustainable and circular business models in construction	3	Adapted to solve case-based specific issues
Sustainability strategies and circular economy	7	Broad overview and conceptualizations of current state of the art within circular economy and sustainability
Sustainable transformation and circular economy in construction	8	The studies are missing the link to specific implementation business strategies

trends in commonly used business models as well as the new wave of prevailing sustainable and circular business models. Thus, the five steps of the integrative review include (Russell, 2005) (1) definition of research problem, (2) generation of literature search, (3) evaluation of the data, (4) analysis of data, and (5) interpretation and presentation of findings. The databases included the university library and Google Scholar and resulted in 28 studies to serve as the basis of the analysis, and Table 6.1 demonstrates the categories of the literature. The chosen studies are peer-reviewed and assessed by the methodology and content quality as well as the relevance to the subjects of circular economy, business model innovation, and sustainability in the construction industry.

The examination of the data (Table 6.1) is also focusing on the various knowledge gaps regarding the practical applications for the sustainable transition of the construction and real estate sector. Based on the framework developed by Lüdeke-Freund et al. (2019) that encompass an analysis of 26 current circular business models from literature, the patterns will be evaluated and compared with other studies to point at the distinctions of conceptualizations in existing business model frameworks. The business model patterns are discussed in the following section and divided into the four major dimensions of "value proposition," "value delivery," "value creation," and "value capture." The findings will provide a broad overview of the coupling between current literature within sustainable business models and the real estate sector in order to understand the construction firms' room for repositioning within the existing structures and frameworks. Furthermore, the discussion will reflect on larger contractors' future business model when adapting towards sustainable practices. The perspective of larger contractor firms, that functions as the construction management role, is dominating the assessments, as they represent the role of being responsible for implementing sustainable and circular initiatives in practice and the fact that their role is often overlooked in the academic literature.

6.3 Findings: Sustainable and Circular Business Models

A business model is defined as "the rationale of how an organization creates, delivers and captures value" (Osterwalder & Pigneur, 2010). The traditional research concerning business models has established the development of models and tools, e.g., the well-known business model canvas and value proposition design (Osterwalder & Pigneur, 2010; Osterwalder et al., 2014) as well as the mapping of diverse strategies for business model innovation (Gassmann et al., 2014). Shifting towards sustainable and circular business models, the value creation is to maintain the economic value embedded in products (Rosa et al., 2019) and support the closing of resource flows (Lüdeke-Freund et al., 2019) by long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling (Geissdoerfer et al., 2017). Also, the increased apprehensions of the existing economic and capitalistic structures are probably part of the growing interest in other types of business models (Schaltegger et al., 2016; Porter & Kramer, 2011). Furthermore, the current linear approach has proven problematic in terms of the transformation process towards a more sustainable economic system and its ineffectiveness for handling global challenges (Weigend et al., 2020). Hence, the change into a circular economy should consider an effective economy at all scales and not only an efficient productive economy as in contrast to the linear financial economy, which dominates the current state (Webster, 2021).

The following sections will present the four major dimensions applied by the study of Lüdeke-Freund et al. (2019), and the overall six business model patterns are as follows:

1. Repair and maintenance
2. Reuse and redistribution
3. Refurbishment and remanufacturing
4. Recycling
5. Cascading and repurposing
6. Organic feedstock

The patterns represent different design strategies and striving for either prolonging life cycles of products, reusing for next product life, remanufacturing of products, closing loops in production, or recovering resources (Lüdeke-Freund et al., 2019).

6.3.1 Value Proposition

A sustainable value proposition must consider the trade-offs between the ideal product/service performance and the optimized social and environmental effects (Boons & Lüdeke-Freund, 2013). Another literature review points at the fact that the value proposition in a circular business model is the creation of a product/service that includes and intentionally uses a circular strategy to create value (Nussholz, 2017). The dimension of value proposition considers products and services with the aim of

prolonging the life cycle of products or providing services related to take-back management, education, maintenance, or waste handling (Lüdeke-Freund et al., 2019). A study from the Netherlands (Van den Brink et al., 2017) aimed at the construction industry points out that the value proposition includes a service provider offering a product that is completely tailored to the clients' needs and delivered in a sustainable manner (Van den Brink et al., 2017). Thus, the study suggests that an external service provider is in charge of finding the most optimal sustainable solutions and consider buildings as customized and unique products. The study argues the need for a third-party service provider, as the delegation of ownership to the contractor or developer is not a feasible option due to the complexity of multiple owners (Van den Brink et al., 2017). Another study from Finland by Ritala et al. (2018) suggests nine different value propositions for sustainable business model innovation as a result of analyzing 500 of the largest global corporations: (1) maximize material and energy efficiency, (2) create value from waste, (3) substitute with renewables, (4) deliver functionality, (5) adopt a stewardship role, (6) encourage sufficiency, (7) repurpose for society, (8) create inclusive value (e.g., suppliers own materials instead of the client), and (9) develop scale-up solutions. In comparison with the study by Lüdeke-Freund et al. (2019), the study by Ritala et al. (2018) is not suggesting the prolonging of life cycle by, e.g., maintaining; however, the value propositions are considering other types of ownership models and services related to material/energy efficiency. A case study of a Danish architectural firm included a circular business model, where the value proposition for testing a mobile concrete recycling plant included (1) circular economy solutions by reducing the carbon footprint and (2) same standards, e.g., price, architectural value, and quality (Nussholz et al., 2019). The case study only focuses on a single material fraction, namely, concrete, and by that facilitates the possibility of setting up clear goals in the value proposition.

6.3.2 Value Delivery

Value delivery includes target customers such as quality conscious, cost conscious, green customers, business-to-business (B2B) customers, business-to-customer (B2C) suppliers, B2B suppliers, and customer-to-customer (C2C) suppliers (Lüdeke-Freund et al., 2019). The case study of a Danish architectural firm suggests the focus on customers who are interested in more environmentally friendly solutions, e.g., public housing organizations (Nussholz et al., 2019). When comparing the two frameworks (Lüdeke-Freund et al., 2019; Nussholz et al., 2019), the customer segment in the construction industry is significantly limited compared to other industries, as the customers are few and typically include public institutions or private investors. Furthermore, the value delivery in the study by Lüdeke-Freund et al. (2019) also consists of value delivery processes and suggests connecting suppliers and customers, providing product-based services, and providing used/take-back used/sharing "products/components/materials/waste." The value delivery processes suggested by Lüdeke-Freund et al. (2019) are highly relevant for

"stand-alone" products and components with shorter life spans where, e.g., "take-back" services would be difficult to implement for a building that requires predictions related to the building's future usage, function, and owners that can differ from the users or residents. The study by Van den Brink et al. (2017) that focuses on "building" level states that the value delivery includes a service provider that performs all the activities from designing to operating by being responsible for the operational lease solution. Moreover, the service provider is responsible for choosing the products and ensuring that the building meets the performance level (Van den Brink et al., 2017). Thus, the study is especially focusing on connecting the construction phase and the operational phase and thereby inspired by the Energy Service Company (ESCO) models (Van den Brink et al., 2017). However, these types of models are difficult to practice in reality due to the multiple stakeholders involved at different project phases.

6.3.3 Value Creation

Value creation includes "partners and stakeholders" and "value creation processes." Partners and stakeholders suggest suppliers, manufacturers, retailers, service providers, public institutions, collectors of products/components/materials/waste, and others (e.g., researchers) (Lüdeke-Freund et al., 2019). Another study points at the importance of establishing alliances with other stakeholders, generating value for multiple value chain partners, or finding new ways of shaping economic transactions between partners (Nussholz, 2017). According to the study of Van den Brink et al. (2017), the partners will always include one or more of the following: the client, external suppliers and/or financiers. The Danish architectural firm strives to engage in partnerships and joint ventures with a concrete recycling plant and a gravel mining company and form a network to develop a certification standard (Nussholz et al., 2019). When comparing the studies (Lüdeke-Freund et al., 2019; Van den Brink et al., 2017; Nussholz et al., 2019), multidisciplinary partnerships are significantly important in the construction industry, as to find new types of solutions by combining competencies from different technical fields. The value creation processes consist of maintaining/repairing, refurbishing/remanufacturing, recycling, upgrading/upcycling, reselling, taking back, winning back base materials, using used products/components/materials/waste, and designing products/components/materials (Lüdeke-Freund et al., 2019). The processes are focusing on stand-online components or products, and the value creation is therefore difficult to adapt when applying the same logic to "buildings." The case of the built environment involves increased complexity as "buildings" represent long-term capital goods with longer life cycles that include repairs and refurbishments throughout a building's life span. Specifically, buildings consist of numerous standardized stand-alone products; however, when assembled, buildings are unique, complex, long-lasting and transformed units (Pomponi & Moncaster, 2017). Nevertheless, the majority of the academic literature within circular economy in construction focuses on the macro-level

of cities and neighborhoods or the micro-level of construction materials, e.g., by life-cycle assessments; thus, there is a lack of focus on the meso-level of buildings (Pomponi & Moncaster, 2017).

6.3.4 Value Capture

Financial models need a transition from "price per unit" to pricing the "job to be done" and value the compliance of needs rather than selling amounts of products (Boons & Lüdeke-Freund, 2013). The value capture dimensions can be developed by capitalizing on additional revenue sources, cost reductions, or nonfinancial benefits related to circular efficiency strategies (Nussholz, 2017). According to the study by Lüdeke-Freund et al. (2019), the value capture's subcategories are "revenues" and "costs." Revenue suggests "additional product revenues, payments per unit of service, payments for functions or results, and price premiums." "Costs" include labor, repair/maintenance, waste handling/processing, manufacturing, resource inputs, transportation/logistics, and supply risks (Lüdeke-Freund et al., 2019). The case study of a Danish architectural firm identifies cost for labor, materials, as well as research and development (Nussholz et al., 2019). The revenue is coming from contractors and public funding for innovation of technology development (Nussholz et al., 2019). The case study represents a special case, as the business model is based on research and external funding that require additional effort for a construction company to initiate. According to another study from the Netherlands that examines three specific case studies from the construction industry, circular buildings must entail a new perspective on ownership of the materials that are only temporarily stored/embedded in a building (Leising et al., 2018). Nevertheless, elements embedded in buildings such as facades or roof are considered as fixtures and therefore an integrated part of the real estate, which challenge the circular economy concept of closing material loops, as the distinction of moveable objects and fixtures often is not considered in the academic literature (Ploeger et al., 2017). The use of more standardized interfaces and Building Information Modeling (BIM) could be applied for marking the components belonging to the supplier and eventually the owner by a continuous documentation process (Ploeger et al., 2017). Other studies point to the importance of providing green taxes in order to change the current economic system and by that generate incentives for driving energy savings (Tsai et al., 2011; De Jesus & Mendonça, 2018; Smol et al., 2020).

The literature on circular and sustainable business models demonstrates either a broad perspective of many studies combined to develop archetypes/patterns (Lüdeke-Freund et al., 2019; Ritala et al., 2018; Bocken et al., 2014) or a theoretic framework (Pomponi & Moncaster, 2017; Nussholz, 2017; Boons & Lüdeke-Freund, 2013; Schaltegger et al., 2016) or individual case studies aimed for solving specific issues (Nussholz et al., 2019; Leising et al., 2018; Van den Brink et al., 2017). Thus, few studies are adapted towards sustainable and circular business

models in the construction industry, and the focus on the contractor firms' role appears neglected in the literature.

6.4 Discussion: Future Business Model of Contractors

Based on the previous analysis of the current literature, the discussion will emphasize the narrower focus on construction companies, which have an essential role in implementing sustainable solutions in practice. Thus, the discussion will include an evaluation of contractors' current business model and reflect on the transformation process towards a more sustainable business model. The main theory will discuss relevant models from the framework of Gassmann et al. (2014) work on 55 business models and Ritala et al. (2018) study on sustainable business model adoption among 500 firms that consists of nine business model archetypes.

Larger contractor firms' current business model is best characterized as a combination of "Long Tail" and "Orchestrator." The Long Tail business model is based on focusing on selling small quantities of a wide range of products. Thus, the Long Tail model includes lower profit margins and smaller volume sales of individual products. The model means that companies can sell niche products and therefore gives customers an advantage by having a wide range of options and therefore increasing the chances of finding the product that suits their individual needs (Gassmann et al., 2014). Contractors' business model is typically not to sell "standard houses," but they are often involved in tendering processes with long negotiations based on the chosen selection and award criteria. The purpose is to calculate the expenses and describe the work processes related to the building project and at the same time possess a high level of flexibility aimed at meeting the customers' myriad of individual needs and considerations (Winch & Cha, 2020). In addition, the business model is also "cost-driven" due to the strong price competition in construction (Berg et al., 2019), and practices include increasing the productivity at the building sites.

"Orchestrator" is a business model where the company focuses exclusively on its core competencies, and activities that fall outside these competencies must be delegated to specialized service providers who have the necessary skills to perform the task successfully. As a management player of the value chain, "the Orchestrator" will spend a large part of its time coordinating time and matching individual value-creating activities (Gassmann et al., 2014). Thus, the business model for larger contractors is categorized by offering niche products by evaluating the buildability (Berg et al., 2019) and also managing highly complex projects, which includes finding suitable collaboration partners, e.g., subcontractors and optimizing planning processes.

When observing contractors' future business model towards addressing the sustainability demands, a suggestion could be the "Trash-to-Cash" business model that includes a value proposition based on recycling or reusing old materials/products. Used materials/products are collected and either resold or transformed into new products. The model assumes that the acquisition of resources includes a low or no

expense associated with developing new products (Gassmann et al., 2014). However, this is not the case when it comes to used building materials/products, which often result in a more costly process compared to the procurement of virgin materials partly due to inflexible building regulations and the lack of standardization in the area (Nordby, 2019; De Jesus & Mendonça, 2018). While this may change in line with new CO_2 requirements in the Danish Building Regulations from 2023 (Ministry of the Interior and Housing, 2021), where scarce resources of recycled/reused products may undertake a development towards becoming cost competitive due to the increasing demand, it is deemed to be a long and slow change process. Nevertheless, there is a greater chance of the "Trash-to-Cash" core business to be managed by waste treatment plants or material/product manufacturers rather than contractors who are used to waste handling, technical processing, and transforming resources. The process could involve take-back schemes, e.g., as a result of materials potentially being owned by manufacturers or real estate companies (Stephan & Athanassiadis, 2017). Hence, new material manufacturers may arise due to the increasing demand for reused materials that also incorporate documentation of the quality. One example is the Danish company "Old Bricks" (in Danish: Gamle Mursten) that recover and resell bricks from demolition (Nussholz et al., 2019). Thus, contractor firms are an important link when it comes to delivering and receiving used materials/products, but the business model itself is far from their core disciplines.

The business model "Make More Of It" enables companies to offer know-how or other resources to other companies in order to generate additional revenue besides the core revenue (Gassmann et al., 2014). Contractor firms' position in the value chain is in development, as the tendency is that contractors are moving towards becoming consulting contractors by an earlier involvement in construction projects (Berg et al., 2019). The increase in project complexity provides a business opportunity for contactor firms to sell "consultancy" services, e.g., related to early buildability advising with the aim of winning the project in the final tendering process. The "Add-On" business model is about pricing the core offering competitively, but additional "extra" services will raise the final price (Gassmann et al., 2014). Thus, the business model generates the possibility of working with options that meet the customer's specific individual needs. As mentioned earlier, the construction industry is highly dominated by competitive pricing and offering sustainability initiatives will often lead to extra costs. As a result, "Add-On" could play a role in the tendering process, as to offer additional services related to environmental sustainability and thereby influence the building client in a greener direction. Also, the contractor can demonstrate potential solutions or initiatives that they are working with to drive the innovation despite the services being outside the economical boundaries of the project. Both business models could be integrated simultaneous dependent on the specific project and the building clients' willingness to engage in new types of interactions either in the early market dialogues or in the tendering negotiations.

Another suggestion is to handle new sustainability requirements according to the "Orchestrator" business model (Gassmann et al., 2014) and by that retain known work practices. The advantage of the model is a close collaboration with external

partners, whose innovative solutions can help strengthen contractor firms' production. Thus, the model prescribes the unnecessary state of optimizing the in-house competencies but rather finds suitable partners who are better equipped to handle the tasks. Contractor firms already hold strong competencies in being a management contractor, so the increased coordinator role as "Orchestrator" is not new but rather an extension of an already existing modus operandi. The role of being the "Orchestrator" will probably change in terms of requiring more time spent on coordination and the establishment of valuable partnering agreements with multiple stakeholders from the value chain. There is no doubt that the sustainable agenda will mean the conclusion of cooperation agreements with innovative partners in the value chain. Moreover, the shift in consumer preferences towards increased sustainability demands (De Jesus & Mendonça, 2018) would probably require upgrading employees' skills to actively contribute to sustainable initiatives and possess qualified knowledge in the dialogue with engineers, architects, and other partners (Brooks & Rich, 2016). However, the level of knowledge might not fall under the category of in-depth technical expertise, thus to a higher degree anticipating the need for long-term partnering agreements for the handling of sustainable initiatives (Aarseth et al., 2017) or participate in new types of procurements (Tang et al., 2019; Häkkinen & Belloni, 2011). One strategy could include hiring in-house sustainability consultants to handle new sustainability requirements. Another strategy is to "decentralize" the knowledge for a high number of employees, e.g., project leaders and site managers instead of having few experts that are centralized in their own team as a support function. In this way, the knowledge on sustainability is more integrated into the organization's portfolio of projects, while the in-depth technical expertise is derived from collaboration with external partners. This strategy has the advantage of not having to rely on few critical resources within the field but the disadvantage of potentially having inadequate in-house knowledge concurrently with increasing sustainability demands.

As mentioned earlier, the study by Ritala et al. (2018) suggests nine archetypes for sustainable business model innovation: (1) maximize material and energy efficiency, (2) create value from waste, (3) substitute with renewables, (4) deliver functionality, (5) adopt a stewardship role, (6) encourage sufficiency, (7) repurpose for society, (8) inclusive value creation, e.g., suppliers own materials instead of the client, and (9) develop scale-up solutions. The business model innovation "create value from waste" is comparable with the business model "Trash-to-Cash" and is concerned with closing the resource loops of materials and products (Ritala et al., 2018). "Deliver functionality" rather than ownership and "inclusive value creation" are examples of business model approaches with alternative types of ownership, e.g., sharing economy. A known example in the construction industry is the ESCO models, where the energy service company is responsible for carrying out the energy services without the client's own capital, and the energy savings will repay the company. Nevertheless, the long lifetimes of buildings complicate the realizability and the profitability of these types of leasing arrangements for the application of circular economy services (Van den Brink et al., 2017). Thus, an advanced circular economy service, e.g., for the facade of a building based on leasing would

potentially lead to an arrangement of consortia, e.g., similar to public-private partnership solutions (Van den Brink et al., 2017). Furthermore, the study also concludes that lease solutions with suppliers would probably only make sense if they work together in longer project commitment for multiple projects, e.g., as comakers or chain partners (Van den Brink et al., 2017). "Adopt a stewardship role" is about taking stewardship as a company by demonstrating additional responsibility to address social or environmental issues, whereas "repurpose for society" is about transforming the corporate structure for sustainability by the striving of using the power of markets (Ritala et al., 2018). Both business models are similar to "the Orchestrator" by possessing a leader role in the industry and directing the project organization towards solving social or environmental requirements set by the building client in the procurement. As a large contractor, it is possible to influence the market and the building clients' decision-making by suggesting sustainable initiatives in early market dialogues and in the tender material.

Current frameworks for sustainable business model innovation (Lüdeke-Freund et al., 2019; Gassmann et al., 2014; Ritala et al., 2018; Bocken et al., 2014) are only to a limited extent considering the distinctive characteristics of the construction industry due to the narrow focus on industry with a production chain like "make-to-stock" (Van den Brink et al., 2017). As a result, the future business model of contractors indicates an increased strategy of applying the "Orchestrator" business model (Gassmann et al., 2014), as the transition points in the direction of an additional coordinator role by participating in earlier project involvement with greater complexity due to the interdisciplinary character of sustainable measures. Namely, sustainable measures are also generating the need for "inclusive value creation" (Ritala et al., 2018) to form new types of long-term partnering agreements for the handling of sustainable initiatives or participate in new types of procurements.

6.5 Conclusions

The main findings include that value proposition must consider a different logic than breaking the shorter lifespans of products, as buildings already include long life cycles of 50–100 years. The value delivery in the construction industry differs in terms of customer segments compared to industry, as they typically represent the role as an "ordered or investors" and are therefore cost intensive, few, and repeatable. Value creation processes are focused on stand-online components or products, but buildings consist of numerous standardized stand-alone products that function as unique, complex, long-lasting, and transformed units when assembled. Finally, the value capture must consider buildings' fixtures such as facades or roofs, which is an integrated part of the real estate that challenges the circular economy concept of closing material loops.

The prevalent business model of large contractors is characterized by a combination of offering niche products, "long tail," and having the role as the construction management, "Orchestrator." The adaptation towards a new circular and sustainable

business model points out that current frameworks are not designed with the purpose for application in the construction industry because the focus is primarily on products aimed at breaking shorter life cycles. The future circular business models of larger contractor firms will probably include elements of the business models "Orchestrator" and "inclusive value creation" due to the increased need for coordination and early project involvement with multiple stakeholders in the value chain for the co-creation of long-term and valuable partnering agreements as well as participation in new types of procurements.

The research supports the SDG 12 titled "Responsible consumption and production," where the development of new sustainable business models in the construction industry is essential in order to meet target 12.2 of "sustainable management and use of natural resources" and target 12.5 of "substantially reduce waste generation' (United Nations, 2016). Furthermore, it can be argued that new sustainable business models in construction are potentially also in line with supporting SDG target 17.17 "encouraging effective partnerships" (United Nations, 2016), because of the potential alternative stakeholder formations when dealing with sustainable measures.

The findings indicate the need for developing new business models that both capture the distinctive characteristics of the construction industry and innovate building contractors' traditional practices towards the sustainable and circular transition. In conclusion, future work will investigate the case study of a Danish contractor firm and map its current business model and the related challenges it faces in the shift towards a new sustainable and circular business model.

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