

On the Hunt for Outdoors' Next (Circular) Top Model

Investigating Ex-ante Assessment Tools for Circular Business Models
in the Outdoor Fashion Industry

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Thesis for the fulfilment of the
Master of Science in Environmental Management and Policy
Lund, Sweden, May 2022



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Published in 2022 by IIIIEE, Lund University, P.O. Box 196, S-221 00 LUND, Sweden,
Tel: +46 – 46 222 00 00, e-mail: iiiee@iiiee.lu.se.

ISSN 1401-9191

Acknowledgements

First of all, I would like to thank all the individuals, companies and experts that supported this thesis with their inputs and gave me the chance to learn from their experience in the exciting interviews conducted for this thesis.

I am incredibly thankful for the opportunity I have been given to learn among so many incredibly talented people and each of you is a unique and wonderful person! You have made these past two years an incredibly exciting, inspiring, and joyful journey for me!

A great thanks to the teachers and staff of the IIIIEE, which not only shared their substantial knowledge and provided me with the tools to accomplish this thesis project, but also made my study time in Lund such a great experience. You are an awesome insti family and I am extremely grateful to be part of it. Big thanks to Beatrice Kogg, Naoko Tojo, Birgitta Olofsson and Patricia Felix, who guided us through this EMP journey and always made things run smoothly (despite a worldwide pandemic).

A special thanks to my supervisor Åke Thidell, for his guidance and encouragement throughout the thesis-writing process. Thanks for always being flexible and available at every hour and for always providing great constructive feedback that inspired me to reflect about my research and increased its quality significantly. Thanks for all the long, fun and productive supervision meetings.

I further like to thank my friends and my family, whether close or nearby, you always counted on me, supported me in all situations and were there for me when I needed you! Thanks to my flatmates for bringing warmth and joy to this cosy, (c)old house. Special thanks to Isha and Martina for always being fun to be around, for keeping up with my sass and for being an infinite source of support throughout the last two years. Greatest thanks to my family who always supports me to pursue my dreams, who awoke my interest in nature and the outdoors, who inspired me to study Environmental Science and take up a master's programme in Lund and who are the greatest role models in my life!

To save the best for last: Thank you B27, you are the most amazing batch there is! Starting as the 'covid batch' we have been through a lot, we became the kings and queens of hybrid learning, we grew bigger and stronger, in number and in character, we hugged trees and hiked forests, we danced together in person and in remote, we cycled the plains of Skåne and conquered the hills of Kullen, we had the tastiest drinks just around the corner and the youngest student the insti has ever seen. You are a wonderful family to me and will be greatly missed.

Until I see you again and you'll be greeted by a warm and friendly "*Tjena tjena!*"

Abstract

Different actors identified the circular economy (CE) as a solution to tackle global environmental challenges and foster sustainable growth. Transitioning to CE requires new circular business models (CBM), which create, capture, and deliver value, based on the principles of the CE. It is, however, a challenging process for companies to see through the wide variety of CBM types and to identify which CBM is most suitable to their circumstances. Thus, they are in the need of tools that support them in assessing CBMs prior to implementation. Since the literature on ex-ante CBM assessment frameworks is scarce, this research project aims to investigate, what ex-ante assessment tools exist and how practitioners in the outdoor fashion industry analyse CBMs prior to implementation. It further explores, what aspects practitioners consider when assessing CBMs and to what extent these are covered by the existing ex-ante assessment frameworks from literature. The research project took an inductive approach and used qualitative methods. Twelve interviews with industry practitioners and experts were conducted, the interview findings were coded manually, grouped and a checklist with eight elements that were assessed by practitioners was developed. These included the CBM elements capabilities, financial flows, product suitability, ecosystem partners, customers, markets, environmental dimension and others. The checklist was then applied to three ex-ante CBM assessment frameworks that were identified in the literature review. The results show that none of the identified frameworks addresses all elements of the checklist, nonetheless two of these frameworks cover most elements and can therefore be considered useful to practitioners in the focal industry. This thesis concludes that it is important for practitioners to assess CBMs prior to implementation and evaluate its environmental performance and financial flows to understand if the intended CBM meets its objective of promoting environmental and economic sustainability. It further recommends that more research on ex-ante assessment tools for CBMs is needed and researchers need to develop tools that address all the elements included in the checklist. Moreover, industry practitioners need to assess their CBMs prior to implementing them and share their experience in the industry in a collaborative way.

Keywords: Circular business models, ex-ante assessment, outdoor fashion industry

Executive Summary

The circular economy (CE) has been identified as strategy that can tackle global sustainability challenges, while at the same time creating sustainable growth and bring wellbeing to humans. Different societal or political actors, such as the European Union (EU) have established CE policies that address resource depletion and environmental degradation and aim at generating economic benefits for all. The CE was defined by many different authors and can best be described as an “industrial system that is restorative or regenerative by intention and design” in which “products are designed for ease of reuse, disassembly and refurbishment, or recycling” (EMF, 2013, p. 15). It centres on the preservation of a resource’s utility for as long as possible and aims to minimise material consumption, by efficiently using and effectively circulating them in resource loops.

Different authors emphasise the need to engage the private sector into the transition towards a CE and get an understanding of how companies can develop and adopt profitable new business models within the CE (EMF, 2013). This led to the emergence of circular business models (CBM) which describes the way businesses create, capture and deliver value with an aim to improve resource efficiency through prolonging product life and closing material loops (Nußholz, 2017). The concept of the CBM incorporates the characteristics of the CE into a company’s way to create, capture and deliver value and thus keeps the economic value in a product after use and exploits it for new offerings (Rosa et al., 2019).

CBMs can take different strategic approaches that can be divided into slowing resource loops, closing resource loops, narrowing resource loops, dematerialization and intensification (Bocken, de Pauw, et al., 2016; Geissdoerfer, Morioka, et al., 2018). Slowing resource loops is achieved through manufacturing long-lasting goods that can be used for long time periods, while closing resource loops targets the recycling of materials, by connecting the end-of-life phase to the production of new products (Bocken, de Pauw, et al., 2016; Braungart et al., 2007). Narrowing resource loops aims for an increased efficiency thus using fewer material, whereas intensification focusses on the product use phase, and dematerialising looks at ways to substitute the utility of products with non-material service (Geissdoerfer, Morioka, et al., 2018).

This thesis project investigates the research field of CBMs in the outdoor fashion industry. The global fashion industry is a sector with significant negative impacts on the environment and is responsible for around ten per cent of the global carbon emissions, consumes significant amounts of resources and generates over 90 million tons of waste per year (Niinimäki et al., 2020). The majority of apparel products flow in a linear ‘take-make-waste’ system, where products are discarded after short use phases and only less than one per cent of the material input is recycled in material loops (EMF, 2017).

The focus of this thesis was further broken down to the outdoor fashion industry, as the circumstances in this industry sector provide good preconditions for CBMs to evolve. The awareness for environmental topics and sustainable consumption among consumers is high (Seppälä, 2010) and the product’s versatile application areas require durability, protection and breathability (Voyce et al., 2005), which makes the applied garments valuable, long-lasting and thus well-suited for CBMs (Hvass, 2015). Many outdoor fashion brands have therefore pioneered in the field of circularity and established CBMs over the past years (for a more elaborate overview see chapter 3.4.2).

However, the wide range of different CBMs can make the decision-making process for companies that want to transition towards CE very difficult. Since changing a firm’s business model (BM) entails the re-alignment of resources and partnerships and can be a risky endeavour, managers or business developers want to base their decision about pursuing a CBM on objective

and reliable results (Averina et al., 2021). It further can have significant advantages for a company to assess its CBM, as it can reveal the actual environmental impact of a CBM (Roos Lindgreen et al., 2022), or point out whether a CBM is worth investing or not (Averina et al., 2021). Most CBM assessment tools, take an ex-post perspective for the assessment of the BM, which requires a CBM to be implemented. Circularity assessment, however, still is a rather rare practice in most companies (Sassanelli et al., 2019), as companies often lack the data to conduct an assessment and do not have the required knowledge about adequate assessment tools (Das et al., 2021). It is therefore necessary to develop assessment tools which support organisations to evaluate and forecast a CBM's performance prior to its implementation (Manninen et al., 2018).

This thesis project set out to research what ex-ante assessment tools for the evaluation of CBMs exist and which of the existing frameworks are suitable for businesses in the outdoor fashion industry. The **aim** of the research project was to contribute to closing the identified research gap and enable organisations to assess which CBM is most suitable and fits their goals the most. For this the following research questions (RQ) were formulated:

- RQ1:** What ex-ante assessment tools for the assessment of CBMs are currently available?
- RQ2.1:** How do practitioners in the outdoor fashion industry analyse CBMs prior to implementation?
- RQ2.2:** What aspects and criteria do outdoor fashion retailers consider when assessing CBM alternatives?
- RQ3:** Which of the existing ex-ante assessment methods are suitable for firms in the outdoor fashion sector?

The project's **research design** took an inductive approach, which included qualitative methods in the form of semi-structured interviews with industry practitioners and experts. A literature review and analysis were conducted to obtain an understanding over the existing ex-ante CBM assessment frameworks. In total twelve semi-structured online interviews with eleven different organisations from Denmark, Germany, Norway, and Sweden were conducted. Nine different companies from the focal sector and three experts with knowledge about CE in the outdoor and textile industry shared their knowledge and thereby contributed to the research project. The insights from the interviews were coded manually and grouped into themes. The themes were then gathered into a checklist that represents the BM elements practitioners deem useful for assessing CBMs prior to their implementation.

The **findings** from the literature review indicate that the field of ex-ante CBM assessment methods is very young and only few suitable tools have been developed over the last few years. Three ex-ante assessment frameworks that are suitable for the assessment of CBMs were identified and compared; the frameworks were developed by Bocken, Miller et al. (2016), Roos Lindgreen et al. (2021) and Averina et al. (2021).

The findings from the qualitative study show that none of the interviewed firms conducted an assessment of their CBM prior to implementation. Interviewees mentioned, lack of data, lack of knowledge about CBMs and lack of resources to undertake an assessment as reasons. Furthermore, no ex-ante assessment tools were known to the practitioner, thus the frameworks identified in the literature review were not known to practitioners. The interview participants further shared insights from their firm's CBMs and elaborated on what aspects they assessed after implementation as well as what they expect from an ex-ante CBM assessment tool.

The mentioned aspects were coded and grouped into the BM elements they addressed. The group of internal BM elements includes capabilities, financial flows and product suitability, the

group external BM elements covers the assessment of ecosystem partners, customers and the market the firm operates in and the group 'other' addresses the environmental dimension as well as other aspects such as legal and social aspects, scalability and ownership. The checklist was developed from these assessment aspects and the interviewee's expectations in ex-ante CBM assessment tool. The checklist was designed to enable an analysis of the existing ex-ante CBM assessment frameworks that were identified in the literature review. It can further be applied by researchers to develop new ex-ante assessment tools for CBMs or by companies that want to examine their CBM evaluation for completeness. The checklist can be found in chapter 4.4.

When applying the checklist to the three identified ex-ante CBM assessment frameworks, this thesis found that none of them addresses all the elements included in the checklist. The Rapid Circularity Assessment by Bocken, Miller et al. (2016) extensively evaluates the CBM's environmental effects on the system it operates in, but leaves the other elements of a BM unaddressed. The Strategic Circular Economy Impact Assessment (SCEIA) by Roos Lindgreen et al. (2021) and the Sustainability Opportunity Assessment (SOA) by Averina et al. (2021) cover all elements of the checklist but have shortcomings in assessing a CBM's financial flows (SCEIA) and addressing the elements product suitability and the environmental dimension (SOA).

This thesis project therefore comes to the **conclusion** that even though they lack certain elements, the SCEIA and the SOA framework are suitable methods for assessing a CBM prior to its implementation. Nevertheless, it was highlighted that it is important to assess a CBM's environmental performance prior to its implementation to evaluate whether the intended CBM actually promotes resource circulation or saving or whether its savings are countered through unintended re-bounce effects. Furthermore, it was emphasised that the financial flows of a CBM need to be addressed by an ex-ante assessment tool to reveal early on whether a circular idea is worth investing in and find ways to scale up the CBM. It further allows decision makers to understand if the intended CBM meets its objective of promoting environmental and economic sustainability.

The thesis hence gives the **recommendations** that more research should be done on ex-ante assessment methods for CBMs to support practitioners in decision making and allow them to focus their time and resources on the most suitable CBM early on. New tools need to be developed that incorporate the findings of this thesis and address all elements and aspects covered by the checklist. These new assessment tools should be developed in collaboration with practitioners and experts from the focal industry, to design them user-friendly and thus promote their application and dissemination in practice; so that practitioners actually use CBM assessment tools in an ex-ante context. It further needs to be explored, whether other industries outside the realm of textiles or other geographical scopes, focus on different aspects and assess CBMs differently.

The **recommendations** for (non-academic) practitioners in the outdoor fashion industry are that companies should apply ex-ante assessment methods before piloting a CBM to avoid channelling resources into CBMs that are not suitable to the firm's circumstances. Furthermore, companies can apply the checklist developed in this thesis as a tool to examine whether they assessed all the BM elements listed and addressed them in their CBM assessment. Moreover, experts and industry networks need to foster collaboration between different actors in the outdoor industry and promote the use of ex-ante CBM assessment tools. Thanks to their position as an intermediary between different companies, industries, and academia they have the ability to bring the right actors together to foster experience sharing in new productive relationships and help to disseminate new knowledge about CBMs, their implementation and how they can be assessed.

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Note to the reader:

The figures and tables in this thesis are colour coded in the following way: Figures and tables addressing the literature review are coloured blue, figure and tables that concern the qualitative data collection are coloured green and figures and tables about the analysis are coloured yellow.

Abbreviations

BM – Business Model

B2B – Business to business

B2C – Business to consumer

CBM – Circular Business Model

CE – Circular Economy

CO₂ – Carbon dioxide

EMF – Ellen MacArthur Foundation

EPA – Environmental Protection Agency

EPR – Extended Producer Responsibility

IIIIEE – International Industrial Institute of Environmental Economics (at Lund University)

LCA – Life-Cycle Assessment

MCDA – Multi Criteria Decision Analysis

RCA – Rapid Circularity Assessment

SBM – Sustainable Business Model

SCEIA – Strategic Circular Economy Impact Assessment

SDGs – Sustainable Development Goals

SOA – Sustainable Opportunity Assessment

TOPSIS – Technique for Order Preference by Similarity to an Ideal Solution

UV – Ultraviolet

UN – United Nations

USD – US Dollar

1 Introduction

1.1 Background

The rapid industrialisation of societies and economies is taking its toll on the planet's ecosystem. The resource intense and high-emission lifestyle of industrialised societies is impacting the global environment to the extent that humanity has already crossed at least four of earth's nine "planetary boundaries" and is currently outside the safe operating space (Steffen et al., 2015). The enormous consumption levels in industrialised economies demand more resources than the earth can regenerate and thus leads to a depletion of the natural resources in a long term.

Despite the significant impacts on the earth's natural environment, the industrialisation has positively affected the living standard of many through enabling a rise in life expectancy, creating prosperous societies and generating thriving strong economies (Jin, 2020; Lavopa & Szirmai, 2012). However, these modernised societies are strictly grounded on a linear economic system, which extracts resources from the planet, transforms them into products and discards the products after they are no longer useful to the user (EMF, 2013). Until the second half of the 20th century this linear economy, which is often termed as a 'take-make-waste system', has not been questioned, as resources seemed overabundant and easily accessible, the system unquestionably generated prosperity and the earth's carrying capacity was not questioned (Du Pisani, 2006). The book "Limits to Growth" published by the Club of Rome in 1972 was the first famous publication to address the flaws and limitations of this paradigm by pointing out the limited supply of earth's resources and sinks and helped establish the environmental and sustainability movement in the wider society (Jackson & Webster, 2016; Meadows et al., 1972).

With the adoption of the "2030 Agenda for Sustainable Development" in 2015 the United Nations (UN) put the sustainability debate at a centre stage of its activities and initiate the "Sustainable Development Goals" (United Nations General Assembly, A/RES/70/1). The Sustainable Development Goals (SDGs) establish 17 goals that shall enable a peaceful, prosperous and (environmentally) sustainable living for all human beings on the planet. Le Blanc (2015) highlights that the 17 goals with their corresponding 169 targets are strongly interlinked to allow the facilitation of policies across multiple sectors. In the centre of this stands the SDG 12 which addresses the economic systems described above, by highlighting the need for "Responsible Consumption and Production" (Le Blanc, 2015). SDG 12 and its 11 targets are closely linked to the concept of circular economy (CE) which is often seen as an alternative to the linear economy paradigm described above. The Ellen MacArthur Foundation (EMF), which is a think tank that promotes the idea of circularity, has defined CE as an "industrial economy that is restorative by intention; aims to rely on renewable energy; minimises, tracks, and eliminates the use of toxic chemicals; and eradicates waste through careful design" (EMF, 2013, p. 22).

As part of the European Union's (EU) climate policy initiative the "European Green Deal" the European Commission (EC) has adopted a decisive "Circular Economy Action Plan" in March 2020 (COM (2020) 98 final). This action plan covers a number of policy areas and addresses aspects such as product design, value chain and waste management to achieve a functioning CE. Nevertheless, many actors from the political, scientific and practical sphere have acknowledged that it will be essential to get the private sector involved in the efforts towards enabling a CE (EMF, 2013). Despite the environmental advantages such as increasing the recycling rate of resources or the reduction of harmful emissions, endeavours towards CE also entail economic benefits of cost savings or efficiency increase for companies (Lieder & Rashid, 2016). This transition, however, requires changes on multiple levels along product life phases, material value chain as well as in terms of market strategies and business models (BM) (Rosa et al., 2019). In the emerging research field of CE circular business models (CBM) are seen as a way to address the aspects of resources

circularity and sustainable value creation on a corporate strategic level. CBMs describe the way businesses create, capture and deliver value with an aim to improve resource efficiency through prolonging product life and closing material loops (Bocken, de Pauw, et al., 2016; Nußholz, 2017).

Operating a CBM can therefore create value while maintaining a high resource quality and a low impact to its environment. In practice, however, many companies face the challenge of identifying an appropriate CBM for their enterprise. There is a wide range of CBMs discussed in literature ranging from renting or sharing models to recycling and take back schemes (Lewandowski, 2016). However, this abundance does not make decision processes easier as it usually does not provide enough insights about which CBM type fits a company's unique goals, resources, and context best. While there is a growing amount of research on the evaluation of circularity of products and BMs after their implementation, there is only few literature sources that facilitates an assessment of different CBM options prior to their implementation (Roos Lindgreen et al., 2020; Sassanelli et al., 2019). The amount of ex-ante¹ assessment tools on the field of CBM assessment is limited and needs to be adapted to the specific context of each firm's resources, market position and industry for practical use. This thesis will address this issue with a focus on the outdoor fashion industry in Scandinavia and Germany.

The global fashion industry is a sector with a very high environmental impact in terms of polluting emissions as well as water and resource use. According to Niinimäki (2020), it accounts for almost ten per cent of the global carbon emissions, consumes roughly 80 trillion litres (80 billion cubic metres) of water per year and is responsible for approximately 20 per cent of industrial water pollution. Besides this, the fashion industry produces over 90 million tons of waste per year and is frequently on the news due to its poor labour conditions and low wages (Chan et al., 2020; Niinimäki et al., 2020). However, it is a large industry with production, supply chains and markets all over the world and thus has an enormous impact on society, consumption and the environment. The majority of products in the fashion industry are flowing in a linear 'take-make-waste' system and thus ends up on landfills or in incineration after use. With 87 per cent of the material introduced into the textile industry not being recycled and only less than one per cent of the material input actually staying in material loops, the industry is a large pollutant and resource consumer at the same time (EMF, 2017).

In recent years, fashion companies have addressed issues of social sustainability, environmental and occupational protection in production processes and supply chains, but seldomly address resource inefficiency and circularity in the industry (Chan et al., 2020). Fashion retailers mostly rely on a fast fashion paradigm since they often have no clear concepts how product life-spans can be extended or return systems can be implemented in a profitable way (Hvass & Pedersen, 2019). Like in many other industries, the concept of circularity is only slowly reaching the apparel industry (Niinimäki et al., 2020), although, CBMs which allow for material resources to flow in closed loops could be a solution to move the industry more towards resource efficiency and CE.

This research project takes a closer look at the outdoor fashion industry as there is strong environmental awareness among customers and brands and hence there have been many initiatives towards CE in this sector recently (Seppälä, 2010). Furthermore, the materials used in the outdoor fashion industry mostly are very durable and valuable and are therefore well suited for multiple use phases or material circulation in resource loops (Hvass, 2015; Joyce et al., 2005). Different companies in the outdoor fashion industry have piloted and tested out CBM variations over the past years, however, they face the same obstacles as firms in other industry sectors. Outdoor fashion retailers that

¹ Ex-ante assessment methods describes methods that are based on forecasts rather than on actual results and can be applied prior to the implementation of a transformation. Ex-post on the other hand defines assessment methods that are based on actual results instead of forecasts or assumptions.

strive towards transitioning to a CBM are confronted with the need to identify a suitable CBM and thus most likely are in the need of ex-ante assessment tools that can support their decision-making process.

1.2 Problem Definition

To increase circularity and establish a CBM, organisations can apply three different strategies towards a closed loop system: slowing, closing and narrowing resource loop (Bocken, de Pauw, et al., 2016). Slowing resource loops can be achieved through manufacturing long-lasting goods that can be used for long time. Closing the resource loops indicates that through the recycling of products, the end-of-life phase is connected to the production of new products. Narrowing loops targets the resource use of products and aims for increased resource efficiency (Bocken, de Pauw, et al., 2016; Geissdoerfer, Morioka, et al., 2018).

CBM theory offers a plethora of BM alternatives and allows firms to redesign a company in many different circular ways (see for example Lewandowski, 2016). Some of these CBM types, like renting or repairing schemes, have existed for centuries, while other models are fairly new and have just been invented recently, such as product-service systems or virtual solutions (Lewandowski, 2016). The large number of different types of CBMs can be very confusing to practitioners and can make designing and establishing a CBM a challenging endeavour. Since the transition to a different BM entails a lot of changes for a company and often involves a shift of resources, market segments and financial streams, decision maker in organisations are well advised to base the decision for venturing this step on an objective evaluation rather than on gut feeling (Averina et al., 2021). Osterwalder and Pigneur (2010) have created a strategic management template that can be used to develop new BMs by visualising the nine different building blocks (customer segment, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) that compose the BM. This so called 'business model canvas' has been adapted by several authors to fit the circumstances for developing CBMs (see for example Bocken et al., 2018; Mentink, 2014; Nußholz, 2017).

While the different CBM canvases are useful tools which help visualising a CBM, they do not replace the step of decision making. For that reason, an additional step of assessing the available CBM options to make a decision based on a rational evaluation is necessary. Sassanelli et al. (2019), however, highlight that circularity assessment in general is still a rare practice in most companies and Das et al. (2021) found out that only few companies forecast the (environmental) impacts of their CBM ideas. This is due to the fact that companies often lack the data to conduct an assessment and do not have the required knowledge about adequate assessment tools (Das et al., 2021). Furthermore, most of the existing CBM assessment methods are designed for the evaluation of a CBM's performance after its implementation. Hence, it is necessary to develop assessment tools which support organisations to evaluate and forecast a CBM's performance prior to its implementation (Manninen et al., 2018).

The academic literature on ex-ante assessment tools is sparse and only few frameworks² that are suited to assess CBMs prior to implementation have been developed recently. There is an assessment tool which allows a planned and structured assessment of a CBM idea regarding its impacts on closing and slowing resource loops as well as its life-cycle and system effects (Bocken, Miller, et al., 2016), a framework that assesses how a sustainability opportunity can be transformed into a CBM (Averina et al., 2021), and an assessment tool that takes a wider and holistic perspective and is fed by inputs from wide range of life-cycle data (Roos Lindgreen et al., 2021). Similar as to how some CBMs are more common in or more suited to certain industries, some assessment tools are

² Note to the reader: The words "tool" and "frameworks" are used interchangeably throughout this theses

more useful in a specific context than others. All assessment tools therefore need to be applied to a certain context and adapted to fit the needs of a specific scope, market or industry. Due to the fact that applying assessment tools to gather insights about an adequate CBM can be a challenging, time consuming and data-intensive task, it is necessary to understand which assessment method is most appropriate for which industry sector.

On account of the reasons mentioned in the previous chapter, this thesis project focusses on the outdoor fashion industry and therefore researches the topic of CBM ex-ante assessment in this sector. Similar as to firms in other business areas, outdoor fashion retailers are in need of well-suited ex-ante assessment tools too. There is a variety of different CBMs of which companies in this industry can choose from, however, it is not well researched how outdoor fashion firms assess and identify the best option out of the ones available. There is a gap of knowledge about how ex-ante CBM assessment in this industry is conducted, what factors practitioners in the focal industry consider during an assessment, and which of the ex-ante assessment frameworks existing in the academic literature are applied.

1.3 Aim & Research Questions

The aim of this research project is to contribute to closing the identified research gap and provide insights as to which of the existing CBM ex-ante assessment methods are useful to practitioners within the outdoor fashion industry. It shall reveal which CBM assessment tool fits the needs of the focal industry best for assessing and forecasting the performance of different CBM options prior to implementation. Thus, it should enable organisations to assess which CBM is most suitable and fits their goals the most. This will make it possible for companies to channel their resources and investments into the desired CBM early on, indicate whether the management should focus on certain circular strategies upstream or downstream in the company's value chain and enable companies to advance their firm's sustainability agenda.

The proposed research project should therefore find answers to the research questions (RQs):

- RQ1:** What ex-ante assessment tools for the assessment of CBMs are currently available?
- RQ2.1:** How do practitioners in the outdoor fashion industry analyse CBMs prior to implementation?
- RQ2.2:** What aspects and criteria do outdoor fashion retailers consider when assessing CBM alternatives?
- RQ3:** Which of the existing ex-ante assessment tools are suitable for firms in the outdoor fashion sector?

1.4 Scope and Delimitations

The scope of the research project is limited to the outdoor fashion industry in Sweden, Norway, Denmark and Germany. This focal industry was determined, because most customers of outdoor fashion retailers spend much time in nature and often have a high awareness of environmental issues and sustainability (Seppälä, 2010). Therefore, many outdoor fashion companies have established sustainability initiatives early on, are quite advanced in terms of actions towards sustainability compared to other industries and furthermore they have piloted different CBM solutions in the recent years. Second, the materials and fibres that are applied in this industry often require high technological standards, need to be weatherproof and water resistant, keep the person wearing it insulated, protect from UV light and more (Voyce et al., 2005). This way the applied fabrics are durable materials that have long a life span and therefore are well suitable for second-hand use, leasing concepts or are worth recycling because of their high material functionality over fashion

trends products within this industry are usually designed in a timeless design so that there are fewer collections every season than in the fast fashion-oriented mainstream markets. This long-term orientation encourages consumers to use the same product for longer and thus counteracts consumerism. This way, the outdoor fashion industry as a sub-sector of the global fashion industry provides a well-suited scope for the proposed research project.

Even though many outdoor product retailers and manufacturers offer hardware like bags, tents or footwear besides their fashion product, the proposed research project shall investigate apparel products only. This product scope has been determined because it allows for a more targeted scoping of the research project and increases the comparability of the results to CE efforts in other industries.

As a geographic scope Germany and the Scandinavian countries of Sweden, Norway and Denmark were determined. This is due to the similar structure of the outdoor fashion markets in these countries and the assumably better access to company representatives and their information. Within this geographical scope only incumbent firms that have transitioned to a CBM or are planning to do so are considered. Companies that were founded with a CBM are not covered by this research. As indicated above, the project will further only investigate ex-ante assessment methods and therefore not consider tools that serve to evaluate the performance of CBM after its implementation.

1.5 Ethical Considerations

Since there was no external funding for the research project, there were no conflicts concerning the researcher's personal integrity during the project. There further was no external party that was in the position to exert pressure on the author nor was able to influence the author's research in any way. All interviews were conducted on a voluntary basis and were conducted with the interviewee's and the company's consent. The individuals and organisations the author approached for interviews had the option to say no to interviews and only shared as much information with the author as they wished to share. No individual was forced to share confidential or personal information.

The findings generated in this research project shall be used to support organisations in their decision making, but it does not intend to influence the decision in favour for or against a certain CBM. There is no scenario under which the findings can cause harm to any individual.

All personal data is treated with care and confidentiality. All contacts, personal data and interview information are stored on a password protected device. Since the author does not intend to publish any company specific data or info, there are no harmful effects for the companies that contribute to the research with their inputs.

1.6 Audience

The intended audience of this master thesis are both researchers and practitioners that work with CBM assessment tools. Researchers in the field of CE or BM development shall be inspired to develop the generated findings further and adapt them to their research cause. Practitioners of the outdoor fashion industry shall be able to use the findings of this thesis to apply them to their needs, they shall be empowered to identify the CBM assessment method that is most suitable to their specific context and transition linear BMs to a more circular future. The same applies to other subsectors of the fashion industry. Furthermore, business model designer or practitioners from other industries are able to use the findings and adapt them to their specific context.

1.7 Outline

This thesis is organised as follows: **Chapter 2** outlines the research design of the project and presents the methods that were used for collecting, processing, and analysing the data. The literature review in **chapter 3** introduces the theoretical framework of this thesis by first presenting definitions of CE and BMs for the CE. This includes BMs, sustainable BMs and CBMs as well as their characteristics as well as drivers and barriers for implementing. The chapter further introduces the topic of CBM assessment, its rationale and introduces three ex-ante assessment frameworks that provide the answer to RQ 1 and will form the basis for the analysis later in the thesis. The last section of the literature review focusses on the outdoor fashion industry and looks into what drivers for CE and examples for CBMs exist in this focal sector. **Chapter 4** presents the findings of the interviews by first describing general findings about the CBMs in the focal industry and then describing what assessment methods the interviewed practitioners applied and what aspects they focussed on during the assessment. This way the chapter answers the RQs 2.1 and 2.2. At the end of the chapter the findings are grouped into a checklist which is applied to the three identified ex-ante assessment frameworks in the following chapter. **Chapter 5** compares and analyses the ex-ante CBM assessment frameworks that were identified in the literature review and evaluates their performance according to the checklist developed prior and thus provides an answer to RQ 3. In **chapter 6** the interview findings and the results of the analysis are discussed and critically reflected. Lastly, **chapter 7** concludes the thesis project and outlines practical implications and future research opportunities.

2 Research Design, Material and Methods

2.1 Researcher's Philosophy

The author of this thesis is aware of the fact that this research project is guided by the author's personal belief systems and views on research as knowledge creation. The perspective the author takes, can be described as a pragmatist worldview, as the author seeks to understand a real-world problem and addresses it by finding an appropriate solution for the focal industry (Creswell & Creswell, 2018). By aiming at finding a solution to the identified problem, the author's perspective goes beyond mere constructivist understanding of the world and the problem.

In taking this perspective, however, the author acknowledges that the author's personal experience and thinking has an influence on the execution of the research as well as the interpretation of the findings generated through the research. The findings reflect on the subjective views of interviewees and the author's interpretation is to a certain extent determined by a subjective and specific context. The author's role as a researcher in this project is therefore highly affected by the author's personal background, which therefore inevitably influences the research in its design, its basic assumptions, its data collection as well as its data interpretation and the findings generated from it. However, this multifacetedness is a common trait in the field of sustainability science. Kemp & Martens (2007) state that sustainability science (and thus research on sustainable development) is characterised by the normativity, ambiguity and uncertainty. "It involves not just the integration of disciplines, but also different individual viewpoints and knowledges in processes of deliberation and assessment" (Kemp & Martens, 2007, p. 8) and is therefore inherently subjective. These circumstances were carefully considered when conducting this research project and need to be kept in mind by the reader of this thesis.

2.2 Research Design

With the aim to answer the RQs introduced in chapter 1.3, different steps were taken and distinct approaches to the research design were applied for each of the RQs. RQ1 was answered through a review of the current academic on the topic of ex-ante assessment tools for CBMs, while RQ2.1 and RQ2.2 required a deeper qualitative investigation of the perspectives of practitioners in the focal industry. RQ3 was then answered through analysing the findings of the literature review with the insights that emerged from the interviews with practitioners. This way the analysis unites the two parallel research steps (literature review and qualitative data collection) as depicted in figure 1.

The project was conducted as qualitative research which investigated the perspectives and needs of practitioners in the focal industry in detail. The research aimed at deriving an understanding about which of the existing assessment methods are suitable for the ex-ante assessment of CBMs in the outdoor fashion industry. For this the author conducted a literature review to identify the crucial concepts of the research field and identify ex-ante CBM assessment tools from literature. Then by taking an inductive approach, the author of this thesis used interviews to capture the real-world experiences of practitioners and asked them about their use and expectations of ex-ante CBM assessment methods. The research project set out to explore the aspects and criteria practitioners considered when assessing CBMs prior to their implementation. For this the author conducted semi-structured online interviews in which the author asked open-ended questions which allowed for more diverse answers from the interviewees.

This research design was chosen because a qualitative approach can be seen as suitable methods to capture the industry practitioner's perspectives on the research matter of this project (Creswell & Creswell, 2018; Sovacool et al., 2018). Due to the fact that there is only limited practical application of CBM ex-ante assessment tools in practice (Das et al., 2021), quantitative methods were not

considered as it would have been highly unlikely that a survey would be understood by practitioners nor provide reliable information to the research project.

The interviews provided first hand insights from practitioners on how they assessed their CBMs prior to implementation, thus answered RQ2.1. The interview data was further coded, analysed, and used to derive a checklist of what elements CBM assessment tools should entail to be of practical use for practitioners within the outdoor fashion industry. This checklist reflects on aspects and criteria practitioners use to assess CBMs and thus provides an answer to RQ2.2. It further addresses what practitioners expect from such an ex-ante CBM assessment tool for them to use it in a real-world context. The data collection steps of the research project are displayed in green colours in figure 1 below, while the methodological steps of the literature review are displayed in blue colour and analytical steps were assigned the colour yellow. This colour code continues throughout this thesis.

Lastly, to answer RQ3 the checklist created in the prior step was then used to analyse a selected group of CBM assessment frameworks from the existing academic literature. The analysed ex-ante CBM assessment frameworks were chosen in a thorough literature review as described in chapter 2.3.1 thus linking back to the answers provided to RQ1. The analysis of the selected assessment frameworks was conducted in a two-fold procedure. In the first step, it was checked how the different frameworks perform under evaluation of the elements determined in the checklist. Second, the performances of the three different assessment frameworks were compared. This procedure determined which of the assessment methods under investigation can be regarded as suitable or useful for practitioners for assessing CBM in the outdoor fashion industry (prior to implementation) and therefore provides an answer to RQ3. An assessment tool can be considered as suitable when it addressed all or most of the elements listed in the checklist.

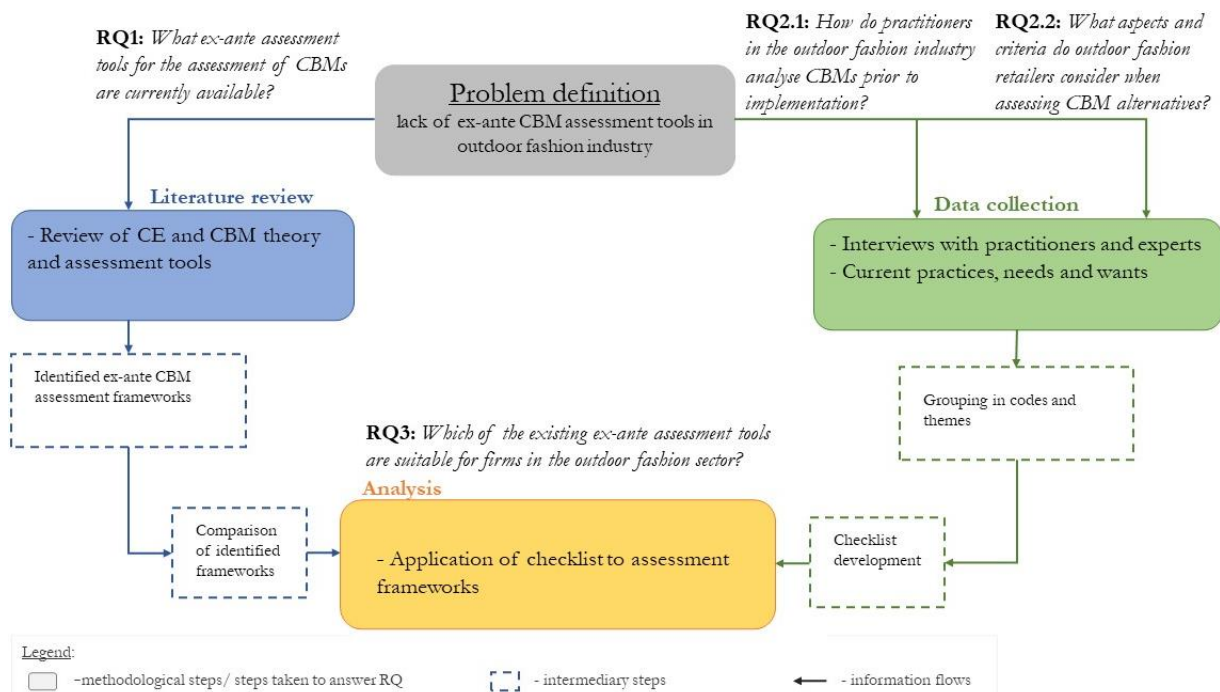


Figure 1- Illustration of the applied research design.

2.3 Data Collection Methods

2.3.1 Literature Review

To lay the theoretical foundation of this research project a literature review of academic and grey literature about CE, CBMs and CBM assessment tools was conducted. Academic literature included accessible peer reviewed journal articles, conference papers, and books published in English and German language by the end of April 2022. The reviewed grey literature contained websites and reports from companies and organisations in the focal sector. The starting point for the literature review was to obtain an overview over literature and concepts in the field of CE. The author identified useful key words and themes and conducted an initial literature search with the help of the search engines LUBsearch and Google Scholar. For this step, the search terms presented in Table 1 were applied and further variations and combinations of the keywords were included in the literature search.

Table 1 - List of applied search terms.

Research themes	Search terms	No. of academic texts after initial search	No. of academic texts identified as relevant
CE & CBM theory	-Circular economy -Circular business models -Business models -Business models for CE -Sustainable BMs -CBM drivers & barriers	78	41
CBM assessment	-CBM modelling -CE assessment -BM evaluation/ assessment -CBM assessment/ evaluation -Ex-ante assessment CBM	34	25
Fashion industry	-Fashion/ textile industry impact -CE in fashion industry -Sustainability in fashion industry	25	12

After this initial search, the titles, abstracts, and keywords were examined for relevance to the research topics. First, the titles of the academic texts were skimmed, and their abstracts read. While papers not relevant to the study were rejected, the papers that were identified as relevant were read entirely. If the content of the paper was relevant, notes were taken, and its content was summarised to be added to a synthesis matrix. Furthermore, additional literature was identified through a snowballing approach, in which the references of the initial paper selection were reviewed (Wohlin, 2014). This process was repeated until saturation, where no additional papers were identified or added to the synthesis matrix.

For reviewing grey literature, the author examined non-academic literature from various industry associations and company websites in the focal sector to get an understanding of what CBM initiatives exist in the industry and which companies are pioneering. This was done to have a clear picture of what businesses are doing to address the topic of CE and check what aspects of the academic literature have been implemented in reality.

The author used a synthesis matrix to collect, compare and analyse the findings, methodology and theoretical frameworks that were found in academic and grey literature. The readings further provided ideas for subcategories and topics that helped to group the findings and figure out where the author needed to conduct more research.

2.3.2 Interviews

The data collected from practitioners was gathered through semi-structured interviews with companies and experts in the outdoor fashion industry. The author chose interviews as data collection method because it is an adequate qualitative method to capture the practitioner's perspectives, experiences and opinions on the research matter in the natural setting at hand. (Creswell & Creswell, 2018; Sovacool et al., 2018). The approach to the interviews further, followed an emergent design as described by Creswell and Creswell (2018), since interview subjects provided frames and insights that shaped future interviews and led to an adjustment of the interview questions if deemed necessary.

This research focusses on outdoor fashion companies that have established CBMs as well as companies that are in the process of doing so or still investigate CBM options themselves. The study focus was on incumbent firms that took or are planning to take the step from a linear BM to a CBM. This sampling was chosen, because the research is looking at assessment tools prior to implementation and investigates what factors influenced other incumbent firms at this stage. Circular start-ups that were founded with a CBM were therefore not included in the sampling group.

The author began by reaching out to industry associations, organisations and other experts which could potentially establish contact to companies and individuals in the outdoor fashion industry. These contacts provided helpful insights on the background of CBMs in the outdoor industry as well as helpful material and shared some potential interview contacts with the author. They further shared their experience of working as networkers for organisations that aim to adapt CE measures and promoting collaboration projects in the field of circularity. In addition to that the author systematically went through member lists of industry associations and circular fashion initiatives and looked up the different companies listed there. On each company's website, the author checked if the company fits the scope of outdoor fashion company, researched the firm's activities in the field of CE and skimmed their sustainability reports (if available) for the topic of circularity.

The criteria for a company to be considered for participation in the research project, was that the firm's website or any other publicly available information source showed that the organisation has adopted a CBM or takes other actions on the field of CE. In the focal sector these were repair services, product rental schemes, take-back schemes, re-commerce models or material recycling programmes. When company documents or their websites mentioned any of these CBMs the author selected them for further researched and contacted the companies via email. Out of the 18 contacted organisations twelve responded to the author's interview request and provided insights about the focal topic through interviews or in form of a written reply. Furthermore, the author applied a snowballing approach, meaning that the author asked the interviewees if they have further contacts that are useful to interview. Through this, one interviewed company shared the author's contact with an affiliated firm, which consequently led to an interview.

Due to the global Covid-19 pandemic, for practical reasons and the limited time as well as resources, all interviews were conducted online. After gaining permission from the interview participants, all interviews were recorded and additionally notes were taken during the interview to collect the practitioner's replies. An elaborate interview guide was created prior to starting the interview phase, it was tested during a pilot interview and open for adaptation during the emergent research design. Prior to each interview, the author sent the interview participants a list of guiding questions with the intention of encouraging them to share their opinions and views on the topic and enable

them to prepare themselves for the interview. The interview guide as well as the guiding question for interviewees can be found in the appendix of this thesis.

2.4 Materials Collected

In total, twelve semi-structured online interviews with eleven different organisations were conducted. One company was interviewed twice, but the interview participants were different employees, as the first interview was conducted with the firm's sustainability manager, which then established contact to the project manager of a new circular initiative in planning. Additional to the interviews one organisation provided written reply to the guiding questions, as they could not make time for a meeting. All interviews were conducted between the end of February 2022 and middle of April 2022 and had a duration between approximately 30 and 90 minutes.

The interview participants represented companies and organisations from five different countries as well as one industry association which works on a European level. Out of the countries within the defined scope (Denmark, Germany, Norway, and Sweden) there was at least one company that was interviewed. In addition to that, one company from Italy with strong market roots in the German and Austrian outdoor market contributed to the research project.

The majority of organisations that participated in the project (nine) were companies from the outdoor industry. Eight of these companies are outdoor apparel brands, while one firm interviewed falls out of this scope, as it mainly produces backpacks and no apparel products. Nevertheless, the company was willing to participate in the research project and shared useful insights. Moreover, two industry associations were interviewed as well as one national Environmental Protection Agency. These individuals were interviewed as experts from the outdoor industry, respectively textile industry. With their knowledge on resource efficiency and circularity in the field of textiles and their contacts to various actors in different industries, the interviewed experts can be seen as information broker. The individuals the author interviewed, occupy different positions in the organisations they work in, such as sustainability, project or CSR manager but also are business developers, CE advisors or sustainability consultants. A list with information about the interviews and the interview participants, can be found in table 2.

The data collected represents the experiences, perspectives, and opinions of the interviewees, respectively their organisation. The author gathered the answers to the interview questions and statements about the interviewee's experience with CBM assessment methods. Moreover, the author gathered insights about the aspects for assessing CBMs and the practitioner's expectations for ex-ante assessment tools. The materials were collected and grouped according to the four themes which made up the interview guide. The themes covered what different CBM options were considered by the company, how companies assessed their CBM options, what aspects they prioritised in their assessment and lastly what expectations they would have of a CBM ex-ante assessment tool.

Table 2 - List of interview participants and information about the interviews.

Interviewed organisation	Organisation type	Country of origin	Interviewee's position in organisation	Date of interview [length of interview]
Company A	Retail company	Germany	Head of Corporate Responsibility Strategy, Innovation and Communication	23. February 2022 [35 min.]
Company B	Outdoor gear and fashion brand	Germany	Strategic corporate development and sustainability manager	4 th March 2022 [37 min.]
Company C	Outdoor gear and fashion brand	Italy	Sustainability Manager	Written interview reply
Company D	Outdoor gear and fashion brand	Norway	Interview 1: Sustainability Manager Interview 2: Project Manager Circular Services	11 th March 2022 [84 min.] 16 th March 2022 [29 min.]
Company E	Outdoor gear and fashion brand	Germany	Team Lead After Sales Services	21 st March 2022 [55 min.]
Company F	Outdoor gear and fashion brand	Germany	Participant 1: Corporate Responsibility Manager Participant 2: Director of Quality & CR	25 th March 2022 [47 min.]
Company G	Outdoor gear brand	Germany	Head of CSR/ Quality/ Repair Service	5 th April 2022 [58 min.]
Company H	Outdoor gear and fashion brand	Sweden	Development & CSR manager	8 th April 2022 [34 min.]
Company I	Outdoor gear and fashion brand	Denmark	Head of Data	13 th April 2022 [45 min.]
Organisation J	Outdoor industry association on European level		CSR and Sustainability Project Manager	18 th March 2022 [74 min.]
Organisation K	National Environmental Protection Agency		Consultant for Resource Efficiency	28 th March 2022 [43 min.]
Organisation L	Outdoor industry association on European level		Sustainability Consultant	8 th April 2022 [46 min.]

2.5 Methods Used to Process Information

From the materials collected through note taking as well as through reviewing the conducted interviews, the author followed an inductive process to develop a set of codes that capture the key issues from the interviews. The codes were determined based on Tesch's (1990) eight steps coding process. For this, the statements of the interview participants were extrapolated and codes were defined, which can be classified as "expected codes" according to Creswell and Creswell (2018)³. The entire material was then coded according to the emergent coding patterns and grouped into themes, which represent the different elements of a BM. In the next step the author developed a checklist for analysing the existing literature on ex-ante CBM assessment tools.

The checklist, which defines the essential BM elements and assessment aspects in ex-ante assessment tools for CBMs in the outdoor fashion industry, was then applied to three assessment methods that are discussed in the current academic literature. In doing so, it was evaluated to what extent the suggested assessment frameworks cover all aspects identified as important categories by the interviewed practitioners. Each of these frameworks were analysed regarding the elements proposed in the checklist. The question asked was whether the criteria of the checklist was addressed by the framework under evaluation. Three answers were possible, yes, addressed, no, not addressed or indirectly addressed. The outcome of this step was a filled checklist for each of the analysed frameworks. In the next step the checklist performances were compared to each other, to look for advantages and shortcomings of the frameworks and to identify which ex-ante CBM assessment tools are suitable for the focal industry sector.

³ Creswell and Creswell (2018) define expected codes as "code on topics that readers would expect to find, based on the literature and common sense" (p. 270).

3 Literature Review

The following chapter reviews the current academic and non-academic literature on the research topic. To gain an understanding of CBM assessment tools for the outdoor fashion industry this chapter introduces the key themes and lays a theoretical foundation for the following chapters. First, the overarching topics circular economy and business models for the circular economy are introduced, then it is elaborated on why and how circular business models need to be assessed prior to their implementation and how this can be done according to different methodologies. At last, the current CE trends in the European outdoor fashion industry are introduced and examples of existing CBMs in example companies are presented. Chapter 3 thereby provides an answer to RQ 1 and introduces the key terms and concepts that will be used to answer the RQ 2.1, RQ2.2 and RQ 3.

3.1 Circular Economy

In light of increasing material prices and resource scarcity, the concept of CE is becoming more and more popular (Hofmann, 2019). It represents an attractive model which many businesses, but also governments and different organisation, are striving to achieve through various means. Steered by the United Nations' Sustainable Development Goals (SDGs), governments all over the world have established policies for a circular and more sustainable economy. Even though not explicitly mentioned, the SDG 12 on ensuring "responsible consumption and production" guides CE policies and provides the concrete target of achieving a sustainable economy by substantially reducing "waste generation through prevention, reduction, recycling and reuse" (United Nations General Assembly, A/RES/70/1).

Against this background the EU is taking a step towards a CE in Europe by implementing a first CE action plan in 2015 (COM(2015) 614 final). The EU's CE action plan has been updated in 2020 and aims at reducing the pressure on natural resources, helps to achieve climate neutrality while creating sustainable growth and employment (COM(2020) 98 final). Therefore, the EU has defined CE as "model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible" to extend the life-cycle of products (European Parliament, 2021).

However, the EU is not the first to define CE, as the topic has been widely discussed in academia and beyond in recent years. Although the origins of CE cannot be traced back to one single author, the idea of CE builds upon different schools of thought developed in the 20th century (Geissdoerfer, Morioka, et al., 2018; Kalmykova et al., 2018). With influences of spaceship economy (Boulding, 1966), limits to growth (Meadows et al., 1972), industrial ecology (Frosch & Gallopoulos, 1986) and cradle to cradle (Braungart et al., 2007) a number of economic, industrial and design concepts have shaped the notion of CE. This led to a wide range of different definitions which often have in common that they describe CE as an "industrial system that is restorative or regenerative by intention and design" in which "products are designed for ease of reuse, disassembly and refurbishment, or recycling" (EMF, 2013, p. 15).

Kalmykova et al. (2018) analysed various CE definitions and came to the conclusion that most of them cover the same key principles. These are the maximisation of the value of the resources in use, eco-efficiency in the form of a reduction in waste and emissions and thus leading to waste prevention (Kalmykova et al., 2018). Geissdoerfer et al. (2017) elaborate further that CE as an economic system is based on slowing, closing and narrowing material and energy loops, with an aim to minimise resource input as well as unsustainable output in the form of waste, emissions or energy leakages. According to Kirchherr et al. (2017), who analysed 114 different CE definitions, most CE approaches have in common that they address the aforementioned principles through reduce, reuse, recycling and recovery strategies.

However, in the centre of the CE concept, stands the utility of the resources taken from earth's natural stocks, which should be preserved for as long as possible and not used wastefully (EMF, 2013). The goal is to minimise the consumption of resources by efficiently using and effectively circulating them in material loops. Different authors describe this with an illustration of two independent resource cycles (as seen in figure 1) where biological and technical materials circulate in (Braungart et al., 2007; EMF, 2013). To avoid contamination of the two resource loops, only biodegradable materials of natural origin should circulate in the biological nutrient cycle, while the technical cycle contains only man-made materials that are designed to be used again or recycled without degrading in quality (Braungart et al., 2007). This ideal economic system is visualised by the illustration in figure 2 below. The differentiation between consumable and durable components of a product are the principles of the CE according to the EMF (2013) as well as a design concept in which waste does not exist, since products are designed to be disassembled or reused. Lastly, all processes that require energy in this CE shall be powered by energy from renewable sources (EMF, 2013).

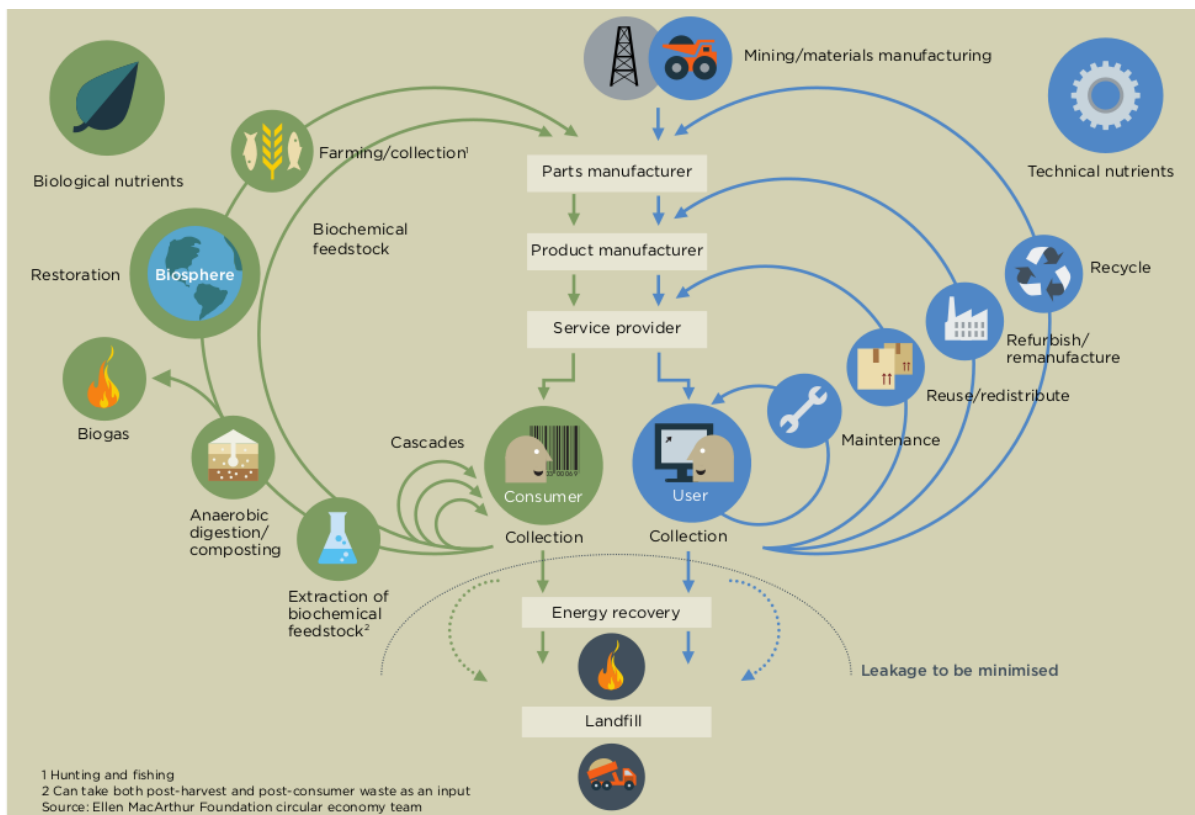


Figure 2- Illustration of the biological and technical cycles of the CE (Source: EMF, 2013)

Independent of its concrete definition, the field of CE is a rather young research area, which grew significantly during the last decades (Geissdoerfer et al., 2017) and continues to be a frequently researched topic. This is because CE promises a solution to a number of different challenges of modern industrial societies. By presenting the prospect of a thriving economic system that leaves the resource intensive linear production system behind, while at the same time creating jobs, value and growth, the concept of CE promises economic and environmental benefits for different actors (Lieder & Rashid, 2016). This makes CE an attractive solution to several global sustainability challenges, as it addresses economic, as well as environmental issues at the same time. Authors further describe that CE needs to operate at different levels simultaneously, with the micro-level addressing products and companies for CE, the meso-level focussing on eco-industrial parks or regional CE strategies and the macro-level which describes CE on a national or global level (Kirchherr et al., 2017).

However, some authors criticise that the CE has evolved to become a research field that focusses on resources use, waste generation and its environmental impacts and at the same time neglects the business and economic perspective to CE, thus leading to a slow dissemination of the concepts among industry actors (Rosa et al., 2019). Kirchherr et al. (2017) as well as Hofmann (2019) on the other hand point out that most authors focus too much on CE as a tool for economic prosperity and thereby do not question capitalist growth paradigms and neglect social considerations.

Despite this criticism, industry practitioners and academics have identified that actions towards the CE on different societal levels and by different actors are needed. Political institutions such as the EU seized the topic and have adopted CE policies that target the consumption patterns of consumers and establish recycling rates for the waste management industry (COM(2020) 98 final). Many authors emphasise the importance of involving the private sector into the efforts of altering the economic system, as they have identified businesses as important group of actors that generate value by processing resources for consumption (EMF, 2013; Hofmann, 2019). In its report “Towards the Circular Economy” the EMF identifies a huge material cost saving opportunity in the CE that could lead to savings of up to 630 billion USD per year (EMF, 2013). The transition towards this CE, however, requires not only drastic efficiency increases in production and recycling processes, but also involves improved product design and changes in the way businesses operate and create value (EMF, 2013). Hofmann (2019) further describes CBMs as “a catalyst for a sustainability transition of the current industrial economic system” (p.362). The authors thus argue that for a successful transition towards circularity of resource flows, it will be necessary to get private businesses involved and gain an understanding of how companies can develop and adopt profitable new business models within the CE (EMF, 2013). From this rationale, the new research field of circular business models and sustainable business models evolved.

In summary, the CE is a concept which describes an economic system that strives for the maximisation of the value of a material in use through an efficient, long-term, and circular use of its resources. Even though there are numerous varying definitions of CE, it has widely been recognised as a great facilitator to achieve the UN’s SDGs and foster sustainable growth.

3.2 Business Models for the CE

3.2.1 The Business Model

A business model (BM) determines how an organisation creates, captures and delivers value (Osterwalder & Pigneur, 2010), by describing how a company converts its resources and capabilities into economic value (Teece, 2010). Further, it defines the rationale of how the value created by a business is delivered to the customer, how the customer is persuaded to pay for the value and how the firm makes profits from the payments (Teece, 2010). Richardson (2005) therefore concludes that a BM consists out of the three major components, value proposition, what the company delivers to its customers, value creation and delivery, how the firm creates and delivers value to the customer, and value capture, how the organisation generates revenues from its interactions. Ranta et al. (2018) reviewed twelve different BM definitions and concludes that BMs can be viewed as a component of a company that bridges the gap between an organisation’s strategy and its operations

3.2.2 Business Model Assessment

For the analysis of business strategies and management practices different concepts have evolved. The two most common and widely known approaches are the market-based view by Porter (1980) and the resource-based view by Barney (1991). The market-based view assumes that the strategy and sources of success of a company derives from its position in the industry (Porter, 1980). The approach therefore takes an outside-in perspective of the company and looks at threats and opportunities in the market it is operating in. With the market-based view, a firms can structure and

analyse its value chain, its external environment and potential market (Kotler et al., 2016). Barney (1991) developed the opposite perspective to Porter by defining the resource-based view, which analyses a company's resources and capabilities to determine its strategic success. The resource-based view investigates, how a firm's core competencies can be utilised in a way that they achieve a significant competitive advantage over competitors. As a main requirement a company's resources therefore need to be valuable, heterogeneous and immovable, accessible and nit imitable (Kotler et al., 2016).

Beyond using the market- or resource-based views to assess a firm's strategic practices, companies can apply different methods to evaluate, compare or forecast the success, design and impacts of a BM. For this purpose, Ishida et al. (2006) developed a list of 38 indicators in the five categories business concept, environment analysis, technology competitiveness analysis, modelling, and profitability analysis. In a similar style, Mateu and March-Chorda (2016) propose a set of eight questions business model designers or decision makers could ask themselves to asses a BM prior to its implementation. These questions ask for the value creation and proposition of the new BM, how its potential market size looks like and how accessible it is for new customers. It further looks at the willingness of potential customers to pay for the new BM, the cost-structure of the BM, whether it is superior to competing BM and what entry barriers might occur. Both methods work with an indicator scale from 1 to 5 that allows the user to rate the BM in focus and indicates whether the BM will be a success or a failure.

3.2.3 The Sustainable Business Model

In order to address global social and environmental challenges, new ways of integrating sustainability principles into a firm's BM have evolved. These sustainable business models (SBMs) use economic, environmental and social aspects of sustainability in defining the organisation's purpose and integrate sustainability measures into all components of the BM (Stubbs & Cocklin, 2008). SBMs further, take a long-term perspective by putting a focus on the creation of social, environmental and economic value creation of the BM (Geissdoerfer, Morioka, et al., 2018). Rather than only taking shareholder into account, all stakeholders to the company are considered and engage with the SBM (Geissdoerfer, Vladimirova, et al., 2018). According to Bocken et al. (2014) organisations "need to introduce change at the core of the business model to tackle unsustainability at its source rather than as an add-on to counter-act negative outcomes of business" (p. 44).

3.2.4 The Circular Business Model

The concept of circular business models (CBM) incorporates the aspects of the CE, described above into a company's way to create, capture, and deliver value. Rosa et al. (2019) therefore describe CBMs as "a new kind of BMs, where the value creation is grounded on keeping the economic value embedded into products after their use and exploit it for new types of market offerings" (p. 2). The value proposition in a CBM is shifted away from providing the ownership over a physical product to providing a functionality to the customer (Lieder & Rashid, 2016). Value in a CBM can be captured through additional revenue streams, cost reduction or non-monetary benefits that come with circular strategies and value preservation (Nußholz, 2017). In her definition of CBMs Nußholz (2017) includes the overarching CE strategies by clarifying that "contributing to extending useful life of products and parts[...] and closing material loops" (p. 12) are indispensable steps when creating, capturing and delivering value in a CBM. Mentink (2014) further points out that a CBM does not require to close the material loops within the system boundaries of an organisation, but that it could also be woven into a network with partners and other BMs that ensures the circulation of resources in closed loops.

3.2.5 The Sustainability Dimensions in CBMs

While some authors criticise that the circularity of an organisation’s BM does not necessarily mean that it is a sustainable one (Blum et al., 2020), Geissdoerfer, Morioka, et al. (2018) emphasises that the three sustainability dimensions social, environmental and economic are represented in each business model element of a CBM. The economic dimension of a CBMs is addressed by ensuring that the company’s offerings generate profit for all involved stakeholders and thereby provide an incentive for actors in the supply chain to extend the use of the product or return it to the system (Geissdoerfer, Morioka, et al., 2018). A product design that minimises the use of natural resources, highlights eco-efficient operations and emphasises the reduction of environmental harm, addresses the environmental dimension in a CBM (Geissdoerfer, Morioka, et al., 2018). The social dimension of sustainability is covered through a strong inclusion of stakeholders and the maximisation of value for the societal well-being (Geissdoerfer, Morioka, et al., 2018). Consequently, Geissdoerfer, Morioka, et al. (2018) as well as Rosa et al. (2019) consider CBMs as part of the group of SBMs, as illustrated in Figure 3 below. Mont et al. (2017) therefore argue that CBMs “are seen as better equipped than traditional business model to address the challenges of economic and physical resource constraints” (p. 12).

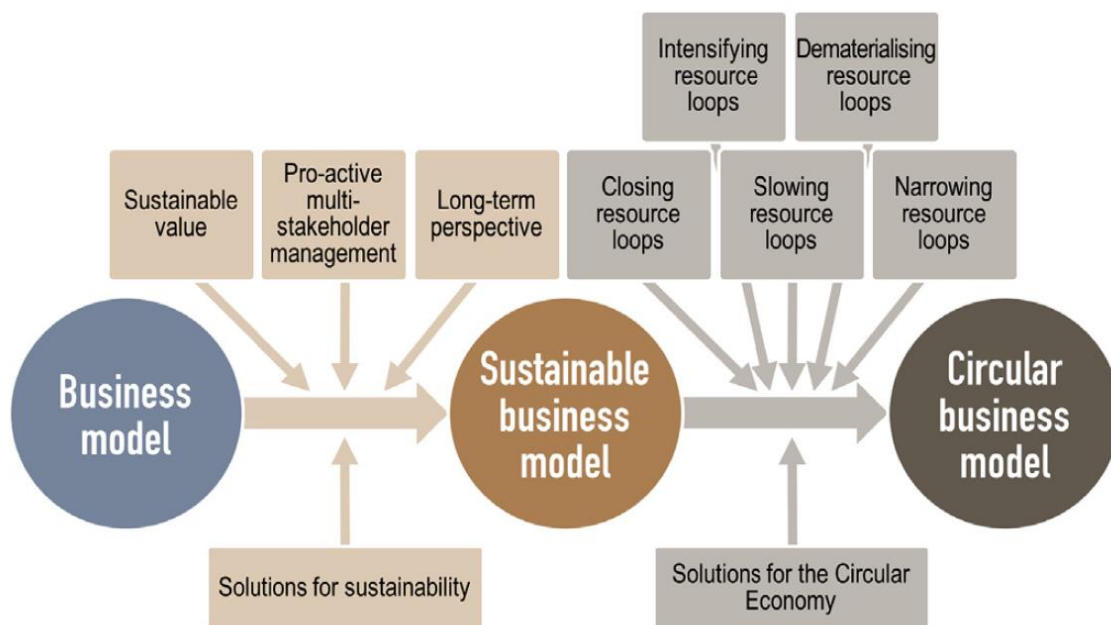


Figure 3 - Illustration of the transition path from a linear BM to a SBM to a CBM (Source: Geissdoerfer, Morioka et al. 2018)

3.2.6 Characteristics of CBMs

The foundation of many CBM strategies can be found in the ReSOLVE framework which was developed by the EMF (2015). It describes a set of six actions (Regenerate, Share, Optimise, Loop, Virtualise, Exchange) which companies or governments can implement to transition to a CE (EMF, 2015). ‘Regenerate’ stands for activities that shift processes to renewable energy and secondary materials, restores natural ecosystems or returns biological resources to the biosphere (EMF, 2015). ‘Share’ emphasises the re-use and shared use of physical goods and prolonging product lifetime through design for repairability and maintenance (EMF, 2015). ‘Optimise’ focusses on efficiency increases and the removal of waste from operational processes and calls for an increased usage of big data, automation technologies and remote steering (EMF, 2015). ‘Loop’ stands for strategies to remanufacture products and components, recycle materials and extract biochemicals from organic wastes (EMF, 2015). ‘Virtualise’ pleads for a dematerialisation where it is possible,

while 'exchange' promotes to replace old materials with new more advanced materials or technologies (EMF, 2015). All actions described in the ReSOLVE framework aim at extending the utilisation period and life time of physical assets and shifting resource use towards renewable material and energy sources (EMF, 2015). However, Lewandowski (2016) criticises that the framework presents how CE principles can be translated into business actions, but not how these relate to the individual components of a BM nor how to design one.

Bocken, de Pauw, et al. (2016) describe CBM strategies in a similar way, when they state that organisations can apply three strategies towards a closed loop system: slowing, closing, and narrowing the loop. 'Slowing resource loops' can be achieved through manufacturing long-lasting goods that can be used for long time periods or can be easily repaired thus extending the use phase of products (Bocken, de Pauw, et al., 2016). CBMs following this approach can take the shape of rental schemes or product service systems that combine tangible products and intangible services to fulfil the consumer's needs (Bocken, de Pauw, et al., 2016; Tukker, 2015). 'Closing the resource loops' indicate that through the recycling of products, the end-of-life phase is connected to the production of new products, thus allowing resource recycling (Braungart et al., 2007; Stahel, 2013). Organisations can apply this approach by establishing take back schemes or recycling systems that enable firms to recover product materials from their customers (Bocken, de Pauw, et al., 2016). 'Narrowing loops' targets the resource use of products and aims for an increased efficiency thus using fewer material per produced good (Bocken, de Pauw, et al., 2016; Geissdoerfer, Morioka, et al., 2018). This efficiency enhancement can be achieved through design changes or material and energy savings in operations (Bocken, de Pauw, et al., 2016; Stahel, 2013). Geissdoerfer, Morioka, et al. (2018) extend this categorisation by the concepts of intensification, which focusses on the product use phase, and dematerialising, which is a way to substitute the utility of products with non-material service or IT solutions.

CBMs can take different shapes and structures. While CBMs such as renting schemes or repair services have been around for many centuries already, some new types evolved in recent years (Lewandowski, 2016). Bakker et al. (2014) therefore distinguished five different classes of CBMs: The classic long-life BM that focusses on durable products that can be used for a long time and in which revenues are generated from sales of the product. The hybrid model which offers a combination of a durable product and short-lived consumables so that the combination of the sales of both creates a revenue stream for the company. The access model in which an organisation provides a certain function to the customer while keeping the ownership and thus charging for the limited access or function of the product. The performance-based model also provides access to a function, with the difference being that value is generated from charging the customer for the final result. And lastly the gap-exploiter model in which a third party exploits the leftover product value of another product system (Bakker et al., 2014). Further, Bocken, de Pauw, et al. (2016) add sufficiency encouraging BMs "that actively seek to reduce end-user consumption through principles such as durability, upgradability, service, warranties and reparability" (p. 313) to this group of CBM.

3.2.7 Drivers and Barriers for the Transition to CBMs

There is a wide range of external and internal drivers that provide incentives and motivation for organisations to changing their BM. External drivers among others can be increasing prices for raw materials on the resource markets, new competitors with lower-priced offerings or the demand from customers and stakeholders (Mont et al., 2017). Moreover, CBMs enable companies to stay within existing waste management laws and environmental standards or allow them to pre-empt stricter regulation or taxes (Govindan & Hasanagic, 2018; Mont et al., 2017). Hofmann (2019) therefore argues that transitioning to a CBM increases a firm's resilience against these external pressures and allows to decouple economic growth from resource consumption.

Besides an philanthropic motivation of decision makers in an organisation there can be several economic arguments as internal drivers towards CBMs. Through material circularity and efficiency increases, companies with a CBM can experience substantial cost savings in their processes and significantly improve their margins (Govindan & Hasanagic, 2018; Mont et al., 2017). Offering circular solutions to the market might in turn open up new customer segments and thus provide a competitive advantage to a firm. A CBM further gives companies an opportunity to increase its brand reputation by capitalising on high product quality and environmental protection and hence tie closer relationships with customers (EMF, 2015). Moreover, CBMs can reduce environmental risks thus reduce liability risks for the firm and decrease the costs for waste management (Mont et al., 2017).

In practice, however, CBMs face several challenges and barriers that slow down their implementation and hinder their dissemination. These barriers appear on the institutional level, for example in the form of regulatory barriers or a lack of financial incentives for the implementation of CBMs or on the market level, such as the risk of market share cannibalisation or an unclear market demand for CBM offerings (Guldmann & Huulgaard, 2020; Mont et al., 2017). But also, the organisational level, like in the form of lacking capital and know-how, and the value chain level, which can become evident in resistance among supplier or unavailability of specialised partners, can display challenges for the implementation of CBMs (Bressanelli et al., 2019; Govindan & Hasanagic, 2018). Besides a general lack of acceptance for CBMs in organisations, there is a widespread lack of knowledge about CBMs, what they entail and how they can be implemented in the company (Govindan & Hasanagic, 2018).

3.2.8 CBM Innovation and CBM Experimentation

Guldmann and Huulgaard (2020) define circular business model innovation (CBMI) as “the process of reconfiguring an existing linear business model to include CBM components in the form of value recreation, redelivery and recapture and an extended value proposition” (p. 3). The process of innovating an incumbent (linear) BM can be a challenge in itself, as most companies do not have the necessary tools to break with the firm’s old value creation logic and innovate locked-in company structures (Chesbrough, 2010). It is particularly challenging when an organisation transitions from a linear value creation system to a CBM, since it also entails the need to co-develop the existing value chain and business network (Geissdoerfer, Morioka, et al., 2018). Nevertheless, innovating an organisation’s BM is an essential step to be able to keep up with the changing societal environment the company is embedded in (Salvador et al., 2020). The transformation from linear to circular BMs often requires the re-alignment with existing and new partners in a firm’s business environment (Averina et al., 2021). Moreover, CBMI may open up new markets and allow companies to tap into new opportunities that were not available with a linear BM (Antikainen & Valkokari, 2016). Therefore, Antikainen and Valkokari (2016) argue that CBMI should go beyond incremental changes in a company’s activities, resources and channels and target multiple levels by taking a holistic perspective of the entire system.

The literature on CBMI grew over the last few years with many authors proposing CBM development frameworks (Antikainen & Valkokari, 2016; Lewandowski, 2016) or implementation roadmaps for CBMs (Frishammar & Parida, 2019), which aim to support practitioners in their efforts to establish a CBM. Geissdoerfer, Vladimirova et al. (2018) therefore determine four different pathways, a company can innovate its BM: As a start-up, when founded with a new circular or sustainable BM, as BM transform that changes the existing BM into a more sustainable one, as BM diversification which expands the existing BM by an additional new more sustainable BM or as BM acquisition, when an additional sustainable BM is identified and incorporated into the firm’s existing one (Geissdoerfer, Vladimirova, et al., 2018).

Despite these frameworks, organisations face the question which CBM to choose from and how it should look like in detail. Reim et al. (2021), moreover, stress that there is no “one-size fits all” solution for CBMs, but instead each organisation needs to consider the individual circumstances and has to design and develop a CBM carefully. As products, services, markets, and resources of organisations differ, they cannot simply apply any CBM type, but need to base the decision of how to move towards circularity on a thorough assessment.

However, different authors emphasise the need for experimentation with new BMs and highlight that piloting CBMs in a small-scale is a crucial part of the transition to CE. Hofmann and Jaeger-Erben (2020) argue that CBMI requires autonomous experimental space within a company’s structure to gain first-hand experience with a CBM and allow testing out new circular solutions. CBM experimentation therefore is described as a method of exploring possibilities of how a company can create value, while at the same time creating positive value for the wider society and the environment (Bocken & Antikainen, 2019). As fundamental restructuring of a firm’s BM implies radical changes and thus risks destabilising an organisation, “launching CBM innovation requires new spaces for organizational realignment” (Hofmann & Jaeger-Erben, 2020, p. 2784). Most companies therefore implement CBMs as an experimental extension to their linear BM which results in a polycentric structure of simultaneous coexistence that allows separate but interconnected value creation systems (Hofmann & Jaeger-Erben, 2020). The aim of CBM experimentation therefore is to provide companies with a safe space with limited risks and resources that allows them to generate collective learnings in collaboration with involved stakeholders (Bocken et al., 2018). According to Bocken and Antikainen (2019) CBM experimentation further is needed to validate new BMs and refine them so that they can eventually be scaled up.

3.3 Assessing CBMs

One approach many researchers and (industry) practitioners in the field of business development use is to visualise how an organisation can create, capture and deliver value through a BM are BM mapping tools (Nußholz, 2018). A widely used approach developed by Osterwalder and Pigneur (2010) is the so-called BM canvas, which allows a simple mapping of the different elements of a company’s BM. The visual representation of a BM reduces complexity and can further be used to support organisations in designing and developing new BMs out of a business idea or support incumbent firms in adapting an existing BM to a changed (market) environment (Doz & Kosonen, 2010). Moreover, it reveals implicit business assumptions and can provide information about obstacles to BM innovation (Doz & Kosonen, 2010; Osterwalder & Pigneur, 2010). This is also important for the transition towards CE, as Frishammar and Parida (2019) point out that understanding a firm’s current BM is an essential prerequisite to be able to adapt it to a CBM.

3.3.1 CBM Canvas and Toolkits

Against this background, different authors have suggested adaptations of Osterwalder and Pigneur’s BM canvas to fit the purpose of transitioning from a linear to a circular BM. Nußholz (2018) designed a CBM visualisation tool that maps the elements of a BM for each possible product life-cycle within CBMs that prolong the useful life of products, parts and close material loops. Daou et al. (2020) developed a framework that adds elements of the social and environmental dimensions to the original BM canvas with the objective to gain a more holistic perspective and create value in circularity for a wider range of stakeholders. Mentink (2014) developed a Business Cycle canvas that is flexible in shape and highlights the different flows within a circular company’s value creation system.

Outside the realm of academia there are similar tools that offer companies web-based platforms and online tools to organise CE ideas and develop CBMs. These tools are often provided by civil interest groups or governmental organisations that work in the field of CE or sustainability and are

based on thorough academic research. The CircularEconomyToolkit.org for example is a publicly accessible online assessment tool that has been developed by researchers at the University of Cambridge (Evans & Bocken, 2014). The toolkit was developed to support companies in moving towards CE by disclosing benefits and challenges as well as guidelines and examples for each opportunity in the CE. It consists of the six steps design, manufacture and distribute; usage; maintain/repair; reuse/ redistribute; refurbish/ remanufacture; product recycling which are organised in an iterative evaluation process that are centred around products as services as a core of the toolkit (Evans & Bocken, 2014).

With the Nordic Circular Economy Playbook Toolkit, a multigovernmental institution in the form of the Nordic Council of Ministries provides a CBM development tool to organisations. It states to give companies the tools needed to design and implement CBMs and transition to CE. The tool has been developed together with the consultancy Accenture and the Finnish Innovation Fund Sitra. Its starting point are five self-learning chapters informing about the relevance of CE and inviting the user to reflect upon opportunities, capabilities, and technologies in their firm. Lastly, it applies an adapted BM canvas and provides analysis tools and implementation tips (Nordic Innovation, n.d.).

The Dutch non-profit organisation Circle Economy developed the Circular Toolbox as a tool specifically for addressing apparel brands which are planning to launch a CBM. The website provides texts, interactive online workshops and audio and visual materials that shall be a step-by-step guide for companies to design and launch a rental or resale CBM within ten months (CircleEconomy, n.d.). It is structured in five episodes ranging from understanding CE and the company's market to designing, fine-tuning and piloting a new CBM.

This list of publicly available tools, however, is not exhaustive and further design, development and implementation tools exist. They have in common that they target business developers and decision maker in companies directly and aim to be more appealing and user friendly to industry practitioners than modelling and development support tools in the academic literature. Often the tools are provided free of charge, but additional consulting is offered by the provider. For the scope of this research these non-academic tools are not further investigated and will not be used for the further analysis.

While the different tools in academia and beyond help to visualise the concrete design and structure of the intended CBM, they do not provide an answer to whether or not the CBM is a good fit for the company and do not take over the step of decision making. Especially since the landscape of CE initiatives and CBMs offers a great and often confusing variety, it is difficult for companies to compare different circular initiatives (Bianchini et al., 2019). As innovating a firm's BM may involve high investment of resources, drastic changes within the company and the re-alignment of partnerships, companies that consider this step need to carefully evaluate their options. Before changing their underlying value creation systems and business strategies, organisations are in the need of assessment tools which enable them to make an informed decision and ponder whether an opportunity is worth investing (Averina et al., 2021). Furthermore, conducting an assessment is a useful step for decision makers to not only structure the ideas for new CE strategies, but also to organise the facts of the current status quo.

3.3.2 Rationale for Assessing CBMs

Over the recent years different tools to assess CE initiatives or evaluate CBM performance were developed (see Harris et al., 2021; Kristensen & Mosgaard, 2020; Moraga et al., 2019; Roos Lindgreen et al., 2020; Saidani et al., 2017; Sassanelli et al., 2019). Various circularity indicators exist, which are often based on tools such as Life-Cycle Assessment (LCA), and focus on the preservation of materials by evaluating how well the resources of a product can circulate in closed loops or how

many new products have been replaced by a company's CBM (Moraga et al., 2019). While Harris et al. (2021) point out that CE assessment methods need to be grouped accordingly to the system levels (macro, meso or micro) they are assessing, they also highlights that adequate assessment methods exist on all levels. Roos Lindgreen et al. (2020) review a total of 74 academic approaches that assess the micro level, thus the company or the product level of CE. Although they found that a large number of CE assessment tools took into account all three dimensions of sustainable development and a circular dimension, only few explicitly target the (circular) BM as object of assessment (Roos Lindgreen et al., 2020). Different authors therefore argue that the field of CE assessment has a low maturity and that only few companies actually apply the available assessment methods (Das et al., 2021; Roos Lindgreen et al., 2020; Sassanelli et al., 2019). Not knowing what nor how to measure CE and how to assess CE initiatives ultimately presents a significant challenge for strategic decision making and therefore displays a strong barrier to transitioning to circularity (Kristensen & Mosgaard, 2020).

Nevertheless, assessing the CE activities of companies has many advantages for organisations. From an environmental perspective it is an important tool to evaluate the actual environmental impact of a CBM (Roos Lindgreen et al., 2022). As different authors have pointed out that a CBM does not necessarily mean that resources are used more sustainable (Blum et al., 2020), an assessment step can check for potential rebound effects of a BM (Harris et al., 2021). It is further useful to test the feasibility of a CBM and evaluate if there is any profit generated through it. Further evaluating a CE initiative on company level allows to check whether all internal capabilities and external partners are well positioned and available for the transition of the firm's BM (Averina et al., 2021). Averina et al. (2021) further highlight that "the assessment stage is crucial because it is the moment when a focal company needs to decide whether the sustainability opportunity is worth investing in or better discarded" (p. 4).

However, it needs to be distinguished between quantitative and qualitative assessment tools. Qualitative assessment methods focus on understanding the available and missing elements of an intended BM and aim to reveal relationships and challenges within the system. Quantitative assessment methods on the other hand, aim to generate quantifiable data and forecast a CBM's environmental or economic performance in numbers. Moreover, it needs to be distinguished between ex-ante and ex-post assessment tools for CBM. While ex-ante assessment tools are designed to be applied prior to the implementation of a CBM, ex-post assessment methods are tools to evaluate the performance of an existing CBM. Ex-post assessment tools enable to quantify and monitor changes in the outcomes of an established CBM and potentially reveal problems that demand amendment. Whereas ex-ante assessment tools take an anticipatory perspective and analyse what results and outcomes can be expected. They can be used to predict the CBM's success and enable companies to detect commercialisation problems and thereby reduce the risk associated with transitioning the firm's BM (Averina et al., 2021).

These distinctions are important, since most of the literature on evaluation tools and assessment frameworks focus on ex-post assessment of CE, CBMs or products and services (Sassanelli et al., 2019). This is a major challenge, because most ex-post tools cannot simply be used for an ex-ante evaluation as they require that a circularity initiative has already been implemented. Moreover, organisations often lack concrete data about products of BMs that are needed for an assessment. Das et al. (2021) find that this inability to comprehensively measure impacts brings high uncertainties, which in turn is a strong barrier to forecasting and assessing CBMs prior to its implementation. Some authors therefore argue that there is a strong need for simpler environmental impact assessment tools that allow an assessment during the design and experimentation phase of a CBM (Das et al., 2021; Manninen et al., 2018).

As to the best of the authors knowledge the topic of assessment tools that can be applied for an ex-ante assessment is shows very little research. In the next step three existing ex-ante CBM assessment frameworks are introduced which are later used for comparing and analysing the results of the study.

3.3.3 Ex-ante CBM Assessment Frameworks

The Rapid Circularity Assessment

In the form of the Rapid Circularity Assessment (RCA) Bocken, Miller et al. (2016) developed an assessment framework that is based on the overarching circularity strategies closing, slowing and narrowing loops as defined by Bocken, de Pauw et al. (2016). The frameworks assess the effects of a CBM on four different levels, on the levels of slowing effects, closing effect, life-cycle effects, and system effects. To assess these high-level strategies, the authors formulated guiding principles in the form of questions for each of the levels. The principles for slowing effects address long lasting products and extending product life and the principles for closing effects target aspects of recycling. The principles for life-cycle effects focus on various ramifications across raw material sourcing, production, transport, use and disposal, while the principles for system effects take a broader perspective on the wider impacts of the innovation implemented through the CBM. While it is not explicitly designed as an ex-ante assessment tool, the RCA framework is intended to be used during the early development phase of a CBM, where changes and adaptations can still be conducted. The framework provides answers of qualitative nature which stimulates the debate of the direction of the new CBM and therefore “can help improve the environmental performance of such new business models at the early stages of business model innovation” (Bocken, Miller, et al., 2016, p. 12).

The RCA takes different BM elements into consideration to assess the impact of the new CBM. On the level of slowing effects, the RCA looks at what measures to extend a product’s life and increase the useful life of the resources have been conducted. In a wider sense it focusses on the product’s design and further considers how the CBM reduces the production output and how consumption and ownership issues can be addressed. For the assessment of closing effects, the RCA looks at the potential for recycling of the product, what happens to the product in the post-consumer phase and how waste can be reduced in the CBM. The assessment of life-cycle effects takes into account the impacts from the entire value chain and investigates potential for efficiency and design improvements as well as a reduction of transportation to decrease the environmental impact. Lastly, the level of system effects looks at the wider impacts of the CBM innovation by taking into account material flows in the wider economic system, impacts on the general society such as rebound effects and other consequences, but also impacts on stakeholders and potential effects of multiple CBMs.

RCA

- Slowing effects
 - Measures to extend product life; address production output, consumption and ownership
- Closing effects
 - Recyclability and recycling rate; reduce waste
- Life-cycle effects
 - Value chain impacts; efficiency increases; reduce environmental impact
- System effects (wider impacts of CBM innovation)
 - Material flows in the system; rebound effects; changes on stakeholder and society; effects on multiple CBMs

Box 1 - BM elements assessed by the RCA framework.

The Strategic Circular Economy Impact Assessment

Roos Lindgreen et al. (2021) propose a Strategic Circular Economy Impact Assessment (SCEIA) framework which was designed to assist in strategic decision-making processes that involve considerations of establishing CE solutions on company level. The tool is based on the normative assumption that CE solutions are only valuable when positively contributing to all three dimensions of sustainability. It therefore utilises a holistic perspective that takes the concept of life-cycle thinking into consideration and thus addresses the products entire life-cycle to prevent environmental burden shifting into different parts of the value chain. The SCEIA framework can further be applied flexibly depending on the scale of assessment and shall emphasise the use of existing sustainability impact assessment methods such as LCA.

The framework consists of five chronological steps that support companies in their strategic decision making. The first phase describes the starting point of the journey towards CE, by recognising the decision to go circular and developing a shared vision that can be translated into concrete sustainability objectives on a strategic level. Phase two is used to identify the scope of what shall be assessed and what stakeholders need to be engaged. This step further provides an overview over the system at hand by quantifying inputs and outputs of the system. The third step contains the diagnosis of the current system by providing an understanding of the relations about the baseline environmental, economic, and social performance of the system and hence identifying impact hotspots. This phase is divided into two sub-steps, the materiality assessment, in which priority impact areas are determined, and the impact assessment, which uses LCA methods (like LCA, social-LCA and Life-Cycle Costing) to quantify the prioritised impacts. Phase four concerns the search, screening and development of a desirable CE strategy. This phase focusses on browsing the available CE strategies with the aim of identifying which strategy can most effectively target the impact identified hotspots. The end of the fourth phase initiates an iterative process that leads the assessment process back to step two and three, where the stakeholder, materiality aspects and impacts of the new CE strategy are assessed again. This feedback loop can be repeated until the most suitable CE solutions have been identified. In the fifth phase, the previously collected options are selected and evaluated. Since the emergence of different trade-offs are highly likely, the authors suggest applying a Multi Criteria Decision Analysis (MCDA) or using decision support tools such as the so-called Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS)⁴.

⁴ MCDA and TOPSIS play no further role in this thesis and are therefore not described further.

SCELA

- Motivation and target
- Vision of CE initiative; formulate goal
- Stakeholder identification
- Internal resource and energy flows
- Current system in company
 - Key operations and processes
 - Impacts of key operations
- Screening for solution; assess market and other industries
- Compare different CBM options (iteration)

Box 2 - BM elements assessed by SCELA framework

The Sustainability Opportunity Assessment

Averina et al. (2021) designed a Sustainability Opportunity Assessment (SOA) framework that specifically targets CBMs. It seeks to identify suitable CBMs that can be implemented to exploit a sustainability opportunity. Therefore, it defines sustainability opportunities as any “idea about how a focal company can improve the environmental, social, and economic value of products, services, and processes” (Averina et al., 2021, p. 2). The SOA framework’s objective is to provide firms with reflection questions and pathways to evaluate the viability of sustainability opportunities prior to designing and implementing a CBM. The authors have identified three key criteria for their assessment process. A capability assessment is key, since it reviews the competencies required to exploit a sustainability opportunity and evaluates whether the required capabilities are internally and externally available or whether new partners need to be acquired. The second key criteria is an ecosystem⁵ alignment that deals with the question of how appealing the sustainability opportunity in focus is for partners and customers. The last key criterion is the value-capture viability, which describes how the focal organisation, and its ecosystem partners intend to generate tangible returns from exploiting the sustainability opportunity. According to the authors, the framework’s front-end nature enables firms to detect potential commercialisation problems and find solutions for them early on.

The SOA framework poses 15 questions which companies need to review prior to designing a CBM. It is designed as an iterative framework that brings the user back to earlier assessment steps, if certain stages are not answered satisfyingly, thus forcing to reconceptualise at an earlier stage. The questions are organised by the key criteria introduced above and the respective ecosystem actor they address. The SOA takes the company’s vision or target as a starting point for the assessment process and then conducts an assessment of the firm’s internal capabilities to achieve this goal. It checks the availability of the resources necessary within the company and its external environment. In the next step the readiness of the company’s partner network is evaluated and the stakeholders interests are analysed. Moreover, the SOA uncovers the cost-revenue flows of the CBM and evaluates whether customers are willing to pay for the products or services offered by the CBM. It further analyses the market and checks whether the expected returns are enough to cover the costs of establishing the CBM.

⁵The term “ecosystem” refers to an organisation’s network, including suppliers, distributors, customer and other stakeholder, which are involved in the delivery of the organisation’s product or services.

SOA

- Target; vision
- Internal capability assessment
 - Competencies; available resources
 - Needs uncovered and acquirability of lacking resources in current ecosystem
- Partner mobilisation
 - Ecosystems readiness and alignment
 - Stakeholder interests analysis
- Cost-revenue flows
 - Customer benefits
 - Customer's willingness to pay
- Market analysis

Box 3 - BM elements assessed by SOA framework

The differences and similarities of the three frameworks are presented in chapter 5, where they are compared and analysed further. The three ex-ante CBM assessment frameworks introduced above lay the theoretical foundation for the analysis of the findings in chapter 5.

3.4 Current CE Trends and CBMs in the Outdoor Fashion Industry

Until here this literature review has focussed on the background and theory of CE and CBM without any specific context or industry in mind. Subchapter 3.4 investigates the topics of CE and CBMs in connection to the outdoor fashion industry. First, the drivers and trends in the European market are explored. After that, real world examples of CBMs in the focal sector are introduced and then information on how companies assessed CBM options are addressed.

3.4.1 Drivers and Trends towards CE in the European Fashion Industry

With the adoption of the Green Deal (COM(2019) 640 final) and the CE action plan (COM(2020) 98 final) the EU put the topic CE on top of its political agenda. In the field of textiles, the European Commission has laid out a roadmap how to make the European textile sector more sustainable by 2030 (COM (2022) 141 final). Among other objectives this strategy includes new eco-design requirements for textile products, proposes a mandatory Extended Producer Responsibility (EPR) for textiles and promotes the establishment of new CBMs in the textile industry. Furthermore, on the field of waste management the EU amended the Waste Framework Directive (2008/98/EC) in 2018 to mandate the member states to set up separate collection of textile waste from 2025 onwards along with specific recycling targets of textile waste.

From an economic perspective, increasing resource prices and a growing demand for sustainable solutions are trends that push companies towards CE. As an industry with long and complex supply chains often stretching over several countries, the textile and fashion industry is based on low resource, production and transportation costs (EMF, 2017; Nünimäki et al., 2020). The fashion industry therefore is prone to risks in the supply chain, as the recent worldwide pandemic and the Suez canal blockage in spring 2021 painfully visualised (Hall, 2021). These supply risks coupled with volatile fuel and raw material prices incentivises companies to pursue circular business ideas with an aim to increase the resilience towards natural or geopolitical events (EMF, 2015).

On a market level, the consumption of clothing, which makes up around 60 per cent of the global textile market, has increased over the last decades, while at the same time its utilisation dropped significantly (EMF, 2017). Consumers thus buy more apparel products while using them shorter

periods and less frequently which is often called ‘fast fashion’. Nguyen et al. (2021) emphasise that this trend is strongly fuelled by large apparel brands such as H&M and Zara which increased the number of new fashion lines they put on the market to the extent that these firms introduce up to 24 new apparel collections each year. The business logic of this prevailing fashion industry is based on ever-increasing sales figure which are only made possible through fast manufacturing of low-quality products in countries where labour is cheap and (environmental) regulations are lax (Anguelov, 2015; Niinimäki et al., 2020). Many authors therefore argue that this paradigm needs to be challenged and issues of consumption patterns need to be changed (EMF, 2017; Niinimäki et al., 2020).

Hvass (2015) argues that the aspect of product quality plays a significant role in this shift, as she identified large potential for fashion CBMs (like renting or re-commerce schemes) in companies that focus on high quality products and durable materials. This is due to the fact that high-quality products are usually made of expensive and thus valuable materials that fulfil specific characteristics such as durability or longevity. Because of that, it is worth reusing, repairing, and maintaining high-quality goods over long time periods compared to low-quality garments for which repair costs might be larger than manufacturing the product new (Hvass, 2015). Therefore, businesses in fast fashion such as H&M on the other hand rather target recycling and material circularity initiatives (H&M Group, 2021). The EMF’s special report on CE in the textile industry, however, argues that recycling efforts and design for recycling should not be prioritised too much, as there are significant business opportunities in circularity (EMF, 2017).

Many products in the outdoor fashion industry are made of highly functional garments and processed synthetic fibres that often are expensive in their production (Voyce et al., 2005). These materials are applied since the products need to fulfil a number of functional requirements when used in the outdoors and a high performance is expected. The products are exposed to different weather conditions and much external stresses, so that the garments are required to be very durable, protect from UV-lights and rain, while insulating and at the same time providing good ventilation to the wearer (Voyce et al., 2005). The increasing demand for textile products that allow the use in specific weather conditions like extreme cold or heat and are exposed to an intense use, have promoted the development of high-performance garments, fibres and coatings over the last decades. While these products are very durable and fulfil the required functions, they also require high resource and chemical input during production. This makes them not only valuable and expensive in the purchase, but also worth repairing or refurbishing the products and thus the perfect fit for multiple uses and circular application contexts.

3.4.2 Examples of CBMs in the European Outdoor Fashion Industry

The most common CE initiative in the outdoor fashion industry is pursuing a product strategy that focusses on durability and longevity of products. As described above, the weather resistant and durable materials applied in many outdoor fashion products enable brands to extend the useful life of products and materials and thus allow them to slow down the material loop of the applied resource (Voyce et al., 2005). This often goes in hand with strategies emphasising the efficient energy and material input which can be realised by product design and process optimisation steps that aim to cut down on the production of wastes and excess materials.

In terms of CBMs, second-hand or re-commerce BMs make up a large number of the existing CBMs in the focal industry. Companies with re-commerce CBMs take back or buy back the products from the consumer to sell them again via different types of platforms. If necessary, the company can conduct refurbishment or repair services on the product before it is put on offer again. It further is an opportunity for companies to make sales from products that were returned, products with manufacturing flaws or B-stock with little additional effort. This way a single product can be sold several times to different customers, while maintaining its quality thanks to repair or

maintenance works. Firms like the Swedish apparel brand Haglöfs have developed their brand's own platform which offers refurbished and reproofed second-hand products (Haglöfs, n.d.). Re-commerce, in particular for second-hand apparel products, has been a flourishing market recently, as young generations of consumers are increasingly open to buying pre-owned garments, compared to older generations of consumer (Cossio, 2020).

Besides brand owned re-commerce platforms, there are numerous examples of peer-to-peer second-hand online platforms, such as eBay, Sellpy or Facebook marketplace. While some companies like Vaude use these platforms to sell their own second-hand and refurbished products (Vaude, n.d.), peer-to-peer platforms or analogue second-hand stores can also pose serious competition to organisations that try to sell their second-hand products via their brand's own platform. Independent of the platform it is sold through, re-commerce BMs can be tied onto other existing CBMs like rental schemes. This way a firm can first rent out its products for a certain period and after it is no longer useable for renting it can be sold on the second-hand market.

Another very common CBM in the outdoor fashion industry is renting. Most rental schemes offer short- to medium-term rental of clothing and gear for certain outdoor activities. The ultimate value this BM promises the consumer is that companies offer to take over the part of shipping, washing, repairing and storing the product. It is a common CBM in the winter sports industry where brands such as Houdini rent winter jackets and pants to customers for their skiing and winter trips (Houdini, n.d.). Especially in the skiing and winter sports industry renting BM for gear as well as clothing is often offered by third party retailers and sport goods outfitters that are located in the skiing resorts or mountain stations (Intersport, n.d.). This way the customer does not need to carry the gear and clothing required for the outdoor activity and can travel light-handed, thus gaining flexibility and convenience.

Some rental schemes, however, offer their customer the chance to rent products for testing purpose with the option to buy the product if satisfied with its performance. For example, Ortovox offers this scheme for products in the winter and skiing sports segment (Ortovox, n.d.), while Adidas has started such scheme for outdoor and running products in the French market (runpack, 2021). The Swedish brand Houdini further piloted a subscription programme that gives the customer flexible access to a library of products for a monthly fee rather than paying for the use of individual piece of clothing (Houdini, n.d.).

Another CBM strategy aiming at slowing the resource loop for products in the outdoor industry are repair services. Most brands offer these services to their customer to extend the useful life of their products by patching, repairing and reproofing the garments. Besides tips how customers can repair or mend the purchased products themselves (Fjällräven, n.d.), many companies in the focal industry offer repair services for free (if within the product warranty) or minor fees (see for example Jack Wolfskin, n.d.; Nordisk, n.d.; Schöffel, n.d.). The company Bergans of Norway goes beyond that and brings the repair service to the consumer by travelling through Norway with a van full of repairing materials and offers repair services to customers on spot (Bergans, n.d.).

Lastly, it is worth mentioning CE initiatives in the field of material circularity and recycling. According to their website the Norwegian brand Stormberg were the first sport and outdoor fashion company in Europe to introduce a deposit-refund system for their products, by adding a deposit to their products, which is refunded to customers when they hand in an old product (Stormberg, n.d.). If not utilisable for second-hand or re-commerce purposes, garments are collected and recycled. There are different textile collection companies such as I:Collect or Soex, which specialised in collecting, separating and recycling garments and thus contribute in closing material loops (I:Collect, n.d.; SOEX, n.d.). Besides this, different research initiatives such as the project network Bio-textfuture bring together fashion brands, manufacturing actors and academia to develop new fibres,

garments and coatings with the aim to provide material solutions towards the CE (Biotextfuture, n.d.).

These examples of existing CBMs in the outdoor fashion industry, however, are only exemplary and do not display an exhaustive list of CBM variations.

3.4.3 Knowledge about Ex-ante Assessment of Existing CBMs

Information about how companies assessed the CBMs prior to their implementation is not publicly available. At least two of the CE initiatives presented in the previous chapter were developed in cooperation with the Circular X project by the University of Maastricht (CircularX, n.d.). Through this project summaries about the development of the CBMs at Haglöfs and Adidas are made accessible. However, the website does not provide insights about how the decision makers or business developers assessed the CBMs prior to implementing them, nor what aspects they considered in this ex-ante assessment. It therefore needs to be investigated whether the information is not available because firms do not want to share the information about how they assessed it in public or whether companies in the focal industry do not assess CBMs prior to implementation.

The interview guide developed for this study therefore takes an explorative approach and poses open ended questions for the interview participants to elaborate on. The questions were grouped in four blocks. In the first block the interviewees were asked about the motivation of the company to transform the BM. This was done to get familiar with what drivers and market pressures made the company seek a CBM and unveils what expectations the firm has in the CBM. Furthermore, the interview participants were asked to describe which CBM options their company considered, to get an understanding of which alternatives the firm has identified and assessed. In the second block the companies were asked about how the assessment process for this CBM was conducted. The intention behind this question was to obtain a picture of the assessment process and examine whether any specific tools or assessment frameworks were applied. The question further checked if the ex-ante assessment frameworks introduced above were known to the interview participants or not. The next block then asked for the aspects which practitioners focussed on in their assessment and what categories they prioritised over others. This was done to understand which aspects practitioners include and for what reasons and further should reveal what criteria and BM elements play the most important roles for practitioners. Lastly, the interview participants were asked what expectations they have in an ex-ante assessment tool and what it needs to entail to be applicable and useful to them. This question block had the intention of generating knowledge about what insights practitioners need from and prioritise in an ex-ante CBM assessment tool. A copy of the full interview guide can be found in the appendix of this thesis.

This literature review introduced the concept of CBMs as the way businesses create, capture and deliver value with an aim to improve resource efficiency through prolonging product life and closing material loops (Nußholz, 2017). It further highlighted the sustainability dimensions included in CBMs, introduced different types of CBMs and presented drivers and barriers as well as ways of innovating BM. On the topic of assessing CBMs this literature review provided an overview over the existing landscape of toolkits and frameworks and identified three ex-ante CBM assessment frameworks which are used in the analysis section in chapter 5 below.

4 Findings from Interviews

In the following chapter the findings from the interviews conducted with practitioners and experts of the focal industry are presented. First, general findings about the CBMs at the interviewed companies are presented. Then, findings about how the interviewed firms assessed CBMs prior to their implementation are introduced, which provides the answer to RQ2.1. Afterwards, the assessment aspects the interviewees mentioned are presented and thus RQ2.2 is answered. Lastly, an assessment checklist is developed, which is based on the aspects assessed by practitioners and their expectations in ex-ante CBM assessment tools. This checklist lays the foundation for the analysis in chapter 5 and thus the foundation to answering RQ3.

4.1 General findings

4.1.1 Insights from Expert Interviews

Three expert interviews with two sustainability consultants from different European outdoor industry associations and one expert in sustainable textiles and resource efficiency from a national Environmental Protection Agency (EPA) were conducted. These experts were interviewed to tap into their knowledge and expertise on resource efficiency and circularity in the field of textiles, respectively the outdoor industry. The findings are now presented to provide a broad picture of CE trends in the outdoor fashion industry and describe what experts know about the ex-ante assessment of CBMs in the focal industry.

All three interviewed experts mentioned that their organisations are taking part in various different working groups and initiatives that address the topics of circularity and sustainability in the respective industry. In these initiatives they work on different projects that aim at generating knowledge and experimenting with CBMs. The activities of the interviewed organisations in the different working groups further focus on networking and bringing industry actors from different supply chain levels together. The representative of organisation K therefore described their role as being “*matchmaker between different companies*”.

Since the interviewed industry associations work with numerous brands in the outdoor industry (not only fashion companies) and the expert from the national EPA works on resource efficiency projects with fashion brands, the three interview participants were able to share a broad perspective about CBMs and CE trends in the focal industry. Interviewee J for example highlighted that it is important to consider the history of the outdoor fashion industry to be able to understand how CBMs are addressed by the industry actors. The interviewee continues that the “*outdoor industry has a lot of its roots based in circular practices. [...] Garments were designed to be able to be repaired during an expedition [...] so repair is a core of a lot of outdoor brands*”. Interviewee J further elaborates that the outdoor industry is closely linked to the environment as it promotes the many activities that are done in nature and thus should not offer products that destroy the environment.

In terms of CBMs in the focal sector, the expert from organisation L pointed out that many of the companies in the European outdoor industry are small firms and are therefore tight on resources and personnel. As a consequence, most firms do not have the chance to invest much time and resources into CE initiatives and thus usually cannot afford to push big circularity projects ahead, but rather focus on small scale experiments. This falls in line with what interviewee K highlights, that as of now most companies with CE activities have their (linear) core BM and have started operating SBMs or CBMs as additional but secondary BMs. The experience with these further is that the CBMs are not necessarily profitable and that most companies plan to upscale them in the future. Moreover, the interviewed expert L observed that it is mostly innovation driven companies which try out new BMs and are keen on experimenting with circularity. This is because they are

used to innovate and often have adapted agile development processes and work in interdisciplinary teams.

Furthermore, the representatives of both industry associations described some of the common challenges for CBM development within the outdoor industry, which lie in the lack of infrastructure required for CBMs. Many of the companies in the industry face the same systemic problems, that backwards logistics or IT platforms are not developed well enough for the CE or that legal questions around CBMs remain unanswered. Moreover, as there are no well-known success stories of companies that have established profitable CBMs, business developers or decision makers often do not know what exactly they are looking for when they approach the topic of CE. Interviewee L stressed that it consequently is difficult for most companies to picture how to make recurring revenues from a CBM. On top of that, interviewee J emphasises that CBMs are no one-size-fits-all solution for companies and emphasises the need for clear and useful CBM assessment methods.

4.1.2 About the CBMs of the Interviewed Firms

As described in chapter 2.3 about the data collection methods applied in this project, all interviewed companies were chosen based on the fact that they have implemented a circularity initiative or a CBM. Beyond what the organisations state on their websites, most of the interviewed firms engage in additional CE activities of which they do not report on their websites but were openly talking about in the interviews. All interviewed companies have established more than one CE strategies and often have implemented multiple CBMs which are visualised in table 3 below.

Table 3 - List of the companies interviewed and their CBMs.

Company	Country of origin	durability	repair	repair guides	renting	second-hand	re-/up-cycling	take-back
A	Germany	X			X*			
B	Germany	X	X	X	X	X	X	
C	Italy	X	X			X		
D**	Norway	X	X		X	X	X	
E	Germany	X	X		X	X		
F	Germany	X	X		X		X	
G***	Germany	X	X		X			
H	Sweden	X	X	X	X			X
I	Denmark	X	X		X		X	
Total number		9	8	2	8	4	4	1

* Rental scheme shut down by the end of 2020.

** Findings from two interviews with the same company.

*** Company outside of product scope, but within outdoor industry.

Durability

It was observed that all companies interviewed understand product longevity and material durability as a fundamental requirement to survive in the outdoor fashion market. This goes in hand with the importance of high-quality products and the need to design products for easy reparability which was both emphasised by all interviewees. “For us quality is key” is a statement taken from the interview with company I, which reflects how all interviewed organisations perceive product quality as the unique selling point of their products. The representative of company F pointed out that for

them high product quality is an essential part of the firm's image and strategy as the customer shall associate the brand with quality.

Repair Service

Eight of the nine interviewed firms offer repair services, which maintain and refurbish the products for customers and thereby extend the product's lifespan. Several interviewed practitioners (companies D, F, and G) highlighted that these repair services had always been offered by the company to provide additional service to the customer. Here the service offer is in the foreground, rather than the sustainability aspect. The reasoning described by interviewees is that extending the product life after sales reflects positively on the brand's image and thus increases the customer's loyalty to the company. Representatives of company D and F explained that the repair workshops are organisational remains of when production was placed in Europe and before it was shifted abroad. All interviewed companies with repair service offer mentioned that repairing products is expensive, which is due to the higher labour costs in Europe. The prices charged from customers often do not cover the costs of running the repair workshop and thus none of the interviewed firms stated to make profits from this type of CBM. For company E for example the primary objective of a repair service is to extend the product longevity and offer the service to customers, while (as of now) profitability of this service is only secondary. The companies G and H even go beyond that and offer their repair services for free of charge, as the customer pays for it when purchasing the product in the first place.

Repair Guides

Two companies (B and H) further provide repair guides on their websites or on demand so that customers are enabled to fix damages themselves. The representative of company H argues that *"the most preferred is to keep the loop as close to the consumer as possible. So they [the customer] maintain and take care of the garments because that's the lowest impact."*

Renting Schemes

Eight of the interviewed companies had established renting schemes for their products. However, one of them has shut down its rental scheme after three years, as it had not achieved the expected growth. Most of the companies interviewed, rent out their products for short and medium long rental periods of a few days or weeks, while only company D also offers their customers to rent their products for several months. Nevertheless, companies view their rental schemes as an opportunity to promote their products and increase their sales. For example, company F's representative highlighted that someone renting their product is a potential customer in the future and similarly the interviewee from company E emphasised that a rental offer is an option for customer to test out products before buying. Company I further mentioned that their rental service is an opportunity for the company to offer customer the product for a short time, if currently the product is unavailable due to supply chain shortages or similar.

Second-Hand or Re-commerce Sales

Four companies have implemented some kind of re-commerce channel to sell their second-hand products. All four companies sell the second-hand products through their brand's own outlets or shops, company B additionally uses the platform eBay as an online channel for their re-commerce business. Based on their experience with a renting model, company A stated that they see much more potential in the second-hand market for outdoor apparel products than in renting. Moreover, company E shared that they conducted a market survey recently which found that consumers were not interested in renting apparel products, so the company decided to focus on renting specialised niche products like apparel products with integrated avalanche protection systems.

Re- or Upcycling Measures

Furthermore, four of the interviewed companies have stated that they have re- or upcycling initiatives for their used products or unused production material. This included internal processes through which new products are made from manufacturing excesses or material wastes as well as upcycling activities. This way company B and I both re-manufacture some of their discarded products into new accessories or apparel products.

Take-back Scheme

Only one interview participant mentioned that the company the interviewee works for, has set up a take-back scheme with partner organisations, in which returned products are recycled into new garments. In this model customers receive vouchers or discounts on their next purchase for every returned garment. Take-back schemes were considered by other companies too (companies B, F and H) but the interview participants stated that their firms have not found a solution to incentivise customers to return the products while promoting additional consumption at the same time not.

In summary, all companies interviewed have established different CBMs that vary in size and type. While some of the interviewed firms have their company's individual re-commerce or rental platforms, other companies have smaller scale second-hand offers for few products in their outlet stores or offer services through third party operators. The reasons for this vary and strongly depend on the firm's available resources and strategy. Only repair services are always organised by the companies themselves, since companies emphasised that they are the only ones having the required know-how, staff, and material to provide the proper repairing of their brand's products.

However, it needs to be highlighted that all interview participants emphasised that their company's CBMs are currently in early developing or experimenting stages. Some are already trying out new innovative solutions or adapt and expand their current BM with circular activities, while others are still in a planning phase and define a new CBM. Regardless of their development stage the interviewed companies all have in common that their current CE initiatives do not make significant profits for the company and are often far away from being a viable BM for the company. The circular offerings of the companies are often based in intrinsic motivation or are intended to be used as marketing tools. It therefore made sense to investigate the firm's intention behind and motivation for transitioning to a CBM.

4.1.3 Motivations for Transitioning to a CBM

As part of the interview guide the interviewed companies were asked for their motivations and intentions to transition towards a CBM. The interview participants mentioned a range of reasons that initiated the change process within or external to the company.

Several interviewees stated that they perceive significant trends in the different industry sectors and expect the trend for CE to sooner or later reach the outdoor fashion market as well. Company D for example states that the company identified a growing demand for circular services from its customers, decided that it wanted to be able to meet this demand and therefore started to offer new services to its customer. But also, many of the other firms interviewed realised that a strong focus on longevity of products, repair offerings or renting schemes have large potential to improve the relationship with customers.

Moreover, the interviewed companies describe that there is strong market pressure which demands future orientation on CE practices. The representative of company I therefore stated that *“in the next 10 years if we don't move from a linear to a circular model, I don't think we will be here doing business. It's a path that has been defined from our CEO and our board member that we need to take [forward]”*. Company F further highlighted that its intrinsic motivation and future oriented management played an

important factor in the company's considerations to transitions to a CBM. As the firm is a family-owned company in eighth generation, CE is perceived as a viable solution to survive as a thriving company and to be well equipped for future changes.

Many interviewees further shared the intrinsic motivation that the outdoor industry is very closely tied to outdoor activities and nature and thus should not put out harmful emissions into the environment and should be thoughtful of its resource use. The firms therefore want to transition away from having a strong consumption focus and aim to extend the use of materials and resources. Interviewee E hence describes *“we want to leave mass consumption behind and shift the focus from owning to renting products to customer”*.

Moreover, some companies use CE strategies as communication and marketing tools for circular practices rather than as CBMs from which they expect large profits. Interviewee C stressed that *“brands need to be ambassadors of these messages and find ways to communicate them effectively; and with our consumers, we need to work on awareness of the importance of these values”*. As an example of that, company D stated that even though their repair service generates losses, the firm seeks to normalise repairing apparel products and wants to educate consumers that repairing products is okay in the fashion world. Similarly, the interviewees B and H highlight that they want to educate and empower consumers to repair garments themselves by providing them the necessary knowledge and repair guides.

4.2 Findings about Applied Assessment Methods

4.2.1 General Findings about Ex-ante CBM Assessment in the Interviewed Companies

The findings from the interviews with twelve different practitioners (nine companies, two industry associations and one EPA) indicate a clear picture of the status of assessing CBMs in the outdoor fashion industry. None of the interviewed companies applied any of the ex-ante assessment frameworks presented in the literature review above. In eight of the nine companies interviewed no specific assessment of the CBM idea was conducted prior to its implementation. Most interview participants rather described the development of a CBM as brainstorming CE strategies and a try-and-error approach. The evaluation of the CBM therefore happened along the way as the companies experiment with one or multiple CBMs. Some firms conducted a very elaborate and detailed evaluation of the established CBM, while others struggled to determine what they want to find out in the evaluation process in specific.

Although the representatives of industry associations did not know of any companies in the outdoor fashion industry that conducted a CBM assessment prior to implementation, the experts had a more holistic overview over existing CBM development toolkits, such as the ones described in chapter 3.3.1 above. The interviewed industry experts (organisations J and L) therefore emphasised the utility of CBM development tools for companies and stressed the importance of disseminating them among industry practitioners.

Three of the interviewed companies (A, C and D) state that they developed a business case of the circularity project prior to its implementation. While this entails that they calculated costs and break even points of the circular initiative they intended to implement, it does not include a thorough assessment of a new CBM that goes beyond mere cost-revenue calculations. Only one of the companies interviewed (company I) stated that they analyse the CBM prior to its implementation. However, they were not able to share insights on how they conducted the ex-ante assessment as the company representative explained that they are currently in the process of assessing the CBM. Moreover, the interviewee shared that they do not know yet what tools to use or how exactly the assessment will be conducted. Interviewee L, from an outdoor industry association, hence,

summarises that the assessment methods discussed in academia are not known to practitioners in the industry and that most companies in the focal sector therefore pilot CBMs and evaluate them after they have been established.

This conclusion falls in line with the experience shared by all interview participants that experimenting with CBMs is very important to the companies as it generates new knowledge and data which was not available prior to implementation. Interviewee A further states that the experimenting phase allowed the company to test different channels, try out pricing models and gain more insights about the cost revenue structure of the CBM. Many firms explained that in the beginning they were not aware of where exactly they want to go with a CBM. The representative of company E thus said *“we need to figure out what we want and need to assess in the first place”* before they can conduct an assessment of the new CBM. Therefore, most interview participants described their approach as conducting an on-the-go evaluation of the new BM.

Nevertheless, the interviewed companies and organisations shared what measures they took to develop the CBM and what criteria they assessed during the process. The point of departure for most companies is to analyse the status quo of the company’s capabilities, because *“it is the most obvious starting point, as it is what the company already has and has available right now”* (interviewee J, from an outdoor industry association). Taking an internal perspective and analysing what resources and partners are available within the company’s network therefore is described as a crucial step to develop potential pathways towards a CBM. Interviewee of company D further emphasises that it is highly important to gain a holistic overview over the company’s business ecosystem and understand all the facets the intended CBM entails. Interviewee L, from an outdoor industry association, however, argues that organisations should instead focus on what the customer wants and make their circular offering more attractive to the consumer. Rather than revolving around themselves, companies should innovate flexibly to be able to respond to the market demand for circular solutions.

Staying within an internal perspective, three interviewees (from companies D and G as well as the organisation J) further highlighted that implementing the CBM enabled new internal feedback loops to emerge. The two companies described that the repair orders they received from customers provided important learnings about product design, such as insights about which parts break frequently, where does worn out material need to be reinforced or which garment needs to be replaced by a more durable one. This new knowledge was then given into the design department, leading to an iterative feedback loop that helps to improve product quality. Interviewee G considers this factor as a significant non-monetary gain of the new CBM and states that *“this is probably one of the main reasons why we are known for our good quality”*, which in turn has great potential of increasing customer retention.

When it comes to the assessment of a CBM’s financial viability, all interviewed practitioners were aware that there currently are no large profit margins in CBMs to expect. They stated that the acceptance among consumers and the demand for CBMs needs more time to grow to be profitable. Nevertheless, the representative of company D described that the person was tasked by the management to *“prove that there is some money in circular solutions as well”* and therefore got assigned to pilot a CBM. Other firms, such as company E, have set clear targets to achieve profitability or at least cover the costs of operating a CBM by a certain year.

Interviewee B further emphasises that in the long run economic viability is perceived as a prerequisite for a functioning CBM and is a top priority that stands above all other considerations. As most CBMs are not that well established (yet), practitioners do not expect large profits, but rather investigate ways to cover the costs of the operations. Company D further stated that with their repair BM they promote the idea of repairing apparel products and strengthen the brand’s

sustainable image. Though the repair service does currently not generate profits, the CBM is used as a marketing tool for the firm and helps to increase customer loyalty.

According to some of the interview participants, companies further need to assess whether their new CBM shall serve business customers (B2B) or directly target the end-consumer (B2C). Company D for example described that with shifting from serving only sporting goods retailers through a B2B model to a B2C structure with direct customer contact, the firm's relationship with end-consumer grew much closer and stronger.

When analysing the market, organisations further assessed what other platforms exist and how the demand for their products looks like. It can help businesses figure out whether they should own a CBM themselves or whether to outsource it to other service providers. This way company H for example realised that their “*products have a pretty huge value in the second-hand market and [...] people sell it for quite a lot of money*”. With that knowledge the company questioned whether consumers are willing to hand in their garments to the company where they might receive less money for the returned product than they would get on the second-hand market. Even though the firm did not take this as a reason to abandon its investment into a company-owned re-commerce model, it concluded that there currently is no large potential to tap into the market and thus decided not to put any urgency into the development.

Lastly, interview participant L stresses that transitioning a company's BM from linear to circular encompasses a transformation of the entire underlying consumption logic, including supply chain, customer interaction and return logistics. This makes it exceptionally difficult to assess CBMs, since an assessment is only possible within the current system and there are no tools to assess a CBM in a new not yet existing system. Moreover, this system transformation involves many uncertainties and unknown variables that are only slowly filled with answers and data and thus makes the process of assessing a CBM an iterative endeavour.

The system has not been built for it, so if we do an assessment of a method right now it is within the current system. It is not within the optimised [system], circular logistics and all of the other things that could actually make things work in a good way. So I think there are a number of those things that makes it [the assessment of CBMs] an iterative process for most [companies]. (Interviewee L, personal communication, 8th April 2022)

This subchapter revealed how business developer or decision makers in companies of the outdoor fashion industry assessed CBMs prior to their implementation. It showed that no concrete ex-ante assessment step is conducted, and most companies piloted small-scale CBMs to gain first-hand experience. This subchapter thereby answers RQ2.1.

4.2.2 Aspects Considered for Assessing CBMs

During the interviews conducted, the participants were asked which aspects they considered during developing and assessing the firm's CBM. The answers were different key topics and aspects, but also reflection questions which decision makers asked themselves during the development process. During reviewing and analysing the interviewee's answers several codes emerged. The notes from all interviews were then manually coded. To reduce the number of codes and complexity, the codes were then grouped into eight themes: capabilities, financial flows, product suitability, partners, target group, market analysis, environmental dimension, and other aspects. This division in eight themes coincides with the BM elements that were assessed by practitioners.

The first three themes capabilities, financial flows, and product suitability reflect on the company's internal BM elements and focus on what is within the company's realm and thus direct power. The themes partners, target group, and market analysis address what is going on beyond the internal perspective and reflect on what resources and insights are required to successfully implement the

CBM in focus. It turns towards a more holistic external perspective on the company in focus. Lastly the environmental dimension as well as other aspects were considered by practitioners, but do not fall under the prior two categories of internal and external BM elements. Nevertheless, the latter two themes are equally important factors which were used by practitioners to assess CBMs. In the following all eight themes are introduced.

Capabilities of the Company

Assessing the internal resources of a company and understanding which capabilities are currently available within the focal firm is an important step that was conducted by many interview participants. To assess a CBM option a company needs to understand what resources, skills and equipment are available and which ones are still needed to realise the intended CBM. It is further a step for companies to figure out which operational processes can be dealt with internally and which should be assigned or outsourced to other organisations. The interview participants further emphasised that it is important for business developers to become aware of the different interests of internal stakeholders and how they can be aligned with the overall vision of a new CBM. Moreover, one of the interviewees (company B) highlighted that turning the view into the company and reflecting on its capabilities structures the complexity and reveals “*pain points*” and challenges in the new CBM.

Financial Flows of the CBM

To understand how circular offerings to customers can be turned into a financially viable BM industry practitioners assessed the financial flows in and out of the company. The interview participants highlighted that it was important for them to determine how the cost-revenue structure of the potential CBM looks like. For this the companies assessed the costs of running the CBM such as the costs for product treatment, repair, and maintenance as well as all return logistics and transportation costs that occur. Conversely, the revenue structure of the CBM needs to be outlined, by defining how the company gets the customer to pay for the products and services. This includes not only to define what the customer pays for, but also how and in what frequency, whether it is a one-time payment, payments over certain periods or a recurring subscription model.

The understanding about the cost-revenue structure allows a company to estimate when a break-even point is reached and the new CBM generates profits. It indicates, for example, how many times a product needs to be rented to cover the costs of the production, logistics and maintenance operations. According to some of the interviewees, this allows business developers to determine a business case out of the CBM idea and convince managers or other decision makers of the feasibility of the CBM.

However, as some of the data to estimate revenue- and cost-streams might not be available, practitioners often base their calculations on the existing data from the current BM. The representative of company B further mentioned that their firm uses publicly available data from the EMF or from academia to forecast their CBM’s growth potential, revenue expectations and costs.

Product Suitability

All nine interviewed companies highlighted that it is an essential step to determine which product shall be offered in the new CBM. Since all interviewed brands offer more than one product in their linear BM, it needs to be determined which of the products shall be offered in a CBM. For example, not all products are suitable for rental schemes, as they might be too difficult to clean for each new client or need other servicing between each rental. Therefore, companies consider the design and material quality of the products and assess if they can be used in the intended CBM. Both design for reparability and durability as well as hygienic requirements need to be taken into account here. Interviewee L further emphasised that the product’s simplicity is important, so that its design is

intuitive for the customer to use, and it does not need specific explanation before renting⁶. This can lead to the conclusion that new products need to be developed to better fit the operations of a CBM or existing products should be adapted.

As most interviewed companies have established more than one CBM initiative, the assessment of product suitability might need to be conducted several times. The interview participants stated that they asked themselves which products are most suitable for which circular offering the company provides. Not all products that can be refurbished by a firm's repair workshop are suitable for a renting scheme, and not all products that are rented to customers qualify for being sold on the second-hand platform after renting. Companies with multiple CBMs thus need to assess and determine which products to use for which CBM. With rental BMs, organisations have to consider whether products are suitable for short-term or long-term rental periods. They further need to consider how high the rest value and quality of a product is after it has been rented out to many different users and whether it can still be sold second-hand or not.

Partners and Ecosystem Alignment

To implement a CBM the external landscape of a company needs to be assessed too. All interview participants mentioned that it is important to them to understand what business partners currently are available in the firm's ecosystem and how ready they are for a transition to a new CBM. Interviewees emphasised that it is essential to understand the different interests of the company's stakeholders and find ways to align them with the firm's endeavour of transitioning to a CBM. This entails identifying and fostering overlapping interests and finding solutions to divergent ones. The interviewee from company E, for example, stressed that an important consideration for the company was that they "*do not want to be competition to retail partners*" but nevertheless find a solution to go forward with a re-commerce scheme for their second-hand products.

In close connection to assessing its internal capabilities, companies have to identify potential for simplification and automation of their processes. This also includes to investigate which operations can be done better, quicker, or cheaper by subcontractors rather than by the company itself. Interviewees pointed out that in doing so, they identified areas and processes where current partners are available and where existing collaborations might become redundant. In case there are no suitable options new solutions have to be developed and new collaborations have to be established.

Beyond this, it can be useful for companies to scope the landscape of industry associations, researchers and CBM best-practice examples that can provide exchange platforms or inspiration to the focal company. Having a good network with competitors and stakeholders can result in beneficial cooperation. This way the interviewed companies C and D have described that they are currently working together with academic research projects which shall provide more insights about the environmental impacts of their products and CBMs. In general, the interviewed experts pointed out that there is strong collaboration among companies in the outdoor industry, which provides regular possibilities for knowledge sharing and information exchange.

Customer Understanding and Target Group

With the internal perspective and the external partners in mind, a company assessing its CBM options should not forget about the customer. Five of the interviewed companies highlighted that gaining an understanding about the target group, their needs and wants is essential. The interviewees state that they asked themselves who the customer is, what the customer wants, where the customer wants it and through which channels to interact with the customer. The answers to these

⁶ With this answer the interview participant did not refer to the apparel products in particular, but rather highlights it for other outdoor products such as hard goods (e.g., tents, backpacks) or camping gear.

questions set the basis for any BM and allows the companies to continue the development of a CBM. Interviewee J further stated that customers in the outdoor industry often are completely different from mainstream fashion markets, so that trends and consumer behaviour are not always comparable with each other.

When trying to comprehend the perspective of the customer, it is essential for an organisation to identify what added value a CBM offers to the consumer compared to a linear BM. “*If you put out a circular service, it has to be better or more attractive than linear*” is how interviewee L stresses the importance of recognising a customer benefit. Being aware of this can indicate what quality the customer is willing to accept in a second-hand product as well as how high the customer’s willingness to pay for a service or product might be. Understanding the underlying consumer behaviour, such as how often and over what time a customer wants to rent a product, can further be used to assess which strategies to pursue to increase customer loyalty or attract new customers. Interviewees A and J, however, also stressed that different consumer age groups interact with circular offerings differently, which is another factor that companies need to consider.

Competition and Market Analysis

All interviewed practitioners stated that another external aspect they considered is the competition and markets it is operating on. They described that it is not only essential to obtain an overview over who the competitors are, but also with what BM they operate. If competing firms have CBMs in place it needs to be investigated how successful they are and how to distinguish the intended CE initiative from theirs. Interviewees further state that it needs to be identified whether there are success stories of CBMs in the market and to what extent the company can mimic the CBM for its own purpose.

In general, the market can provide further useful insights to the company. Is there a customer demand for circular offerings or services? How high is it? Is it worth tapping into the demand? Moreover, evolving trends and market pressures should be observed carefully to be able to quickly react to urgent demands. According to interviewee K observing trends in other industries further allows to pick up ideas from different sectors and adapt them to the company’s circumstances. Especially for companies that are active in different geographical markets, it is important to determine which CBM is feasible on which market. Companies H and I for example are active in the European market, but also outside of it and both stated that they assess the CE initiatives for each country they operate in individually.

Environmental Dimension

All except for one company stated that environmental aspects played an important role in their considerations of assessing the CBM options. The focus, however, lies on CO₂ emissions in connection with the CBM. The basic consideration used by many interviewed companies looked at how their CE strategy can be used to contribute to the company’s climate targets. When developing the CBM, emissions from reverse logistics and transportation were taken into account. For calculating the impacts of CBM options, the firms mainly use existing emission or life-cycle data and the existing knowledge within the company. Besides the focus on emissions, the three companies B, F and H also reflect on how their CBM can reduce consumption and decouple success from economic growth.

Other Aspects

The most frequently mentioned aspect that cannot be allocated to any of the seven themes above is the scalability of the CBM. Four interviewees (companies A, B, D and I) mentioned that they investigated how feasible their CBM ideas are in terms of upscaling to a CBM that operates in large quantities. Therefore, they looked at what scaling processes and services up entails and what pre-conditions the company needs to fulfil for that. The key questions for these considerations,

however, were that the companies wanted to find out how the CBM can be scaled up to generate profits for the company.

Other aspects considered by two interview participants (company G and I) were legal aspects in terms of what the regulatory framework for the intended CBM looks like and what laws the CBM will be subject to. This specifically focusses on the topics of warranties for the company's products as well as issues of liabilities; for example, if an accident happens because of product that was not maintained properly. Furthermore, ownership questions need to be addresses by determining whether the company offering a CBM solution maintains the ownership of the product (for example during renting), whether it is transferred to the customer or even a service company in between.

Two companies (F and I) further stated that they took social aspects into account. Firstly, they define clear social standards and enforce the compliance within their supply chain. Moreover, the firms aimed at keeping the jobs of their employees in Europe rather than shifting it abroad to cheap production countries and making use of their know-how by including them in the CBM. The representative of company I further highlighted that they engage with peoples with disabilities in their organisation.

Some other general considerations different interviewees mentioned are questions concerning what platforms and channels to use for offering products. Firms need to decide whether they want to offer their products and services through online channels or analogue and whether they want to run the CBM within their company or through other third-party partners. Companies with a rental scheme further mentioned that it should be determined whether the company focusses on long-term or short-term rental of their products and factor in considerations of product design and customer demand into this decision.

This subchapter introduced the different aspects which were considered by practitioners when they assessed their circular initiatives and CBMs. Table 4 below displays the described aspects and themes and provides example questions for the assessment step. The subchapter thereby answers RQ2.2.

Table 4 - Assessed aspects and example questions grouped into eight themes (own illustration).

Themes/ BM elements	Assessed aspects	Example assessment questions
Capabilities	<ul style="list-style-type: none"> - Internal resources - Skills, equipment, employees - Needs - Internal stakeholder 	<ul style="list-style-type: none"> ○ What resources, skills and machines are already available? ○ Where are pain points or challenges? ○ What tasks and process to do within the company and what to assign/ out-source to business partners?
Financial flows	<ul style="list-style-type: none"> - Cost structure - Revenue structure - Return on investment/ break-even point 	<ul style="list-style-type: none"> ○ What does the cost-revenue structure look like? ○ What are the costs? How to generate revenues? ○ When is the return on investment/ break-even point achieved? ○ What data/ knowledge about financial aspects is available?
Product suitability	<ul style="list-style-type: none"> - Product range - Product design (for repairability) - Quality - Material circulation 	<ul style="list-style-type: none"> ○ Which products or which product line shall be offered in CBM? ○ How can the product be designed to be suitable for CBM better? ○ What is the rest value and quality after product has been through a renting scheme? Can it still be sold second-hand?
Partners	<ul style="list-style-type: none"> - External perspective - Business network - Supply chain - Stakeholder's interests 	<ul style="list-style-type: none"> ○ What partners are there/ do we have available? ○ What are their interests? ○ What channels/ IT solutions/ payment methods/ tracking solutions are there?
Customer	<ul style="list-style-type: none"> - Understanding customer - Needs and wants - Willingness to pay - Added value through CBM 	<ul style="list-style-type: none"> ○ What added value does customer have in CBM over linear BM? ○ How to increase the customer's loyalty? How to interact with the customer? How can new customer groups be attracted?
Market	<ul style="list-style-type: none"> - Competitors - Demand - CBM examples 	<ul style="list-style-type: none"> ○ Whom are we competing with? ○ What are their CBMs and how successful are they with it? ○ Is there a customer demand for these offerings/ services? ○ On which markets do we want to establish our CBMs?

to Table 4 - Assessed aspects and example questions grouped into eight themes (own illustration).

Environmental dimension	<ul style="list-style-type: none"> - CO₂ emissions - Climate targets - Consumption 	<ul style="list-style-type: none"> ○ How can CE strategy be used to contribute to climate targets? ○ How can CBM be used to reduce consumption?
Other aspects	<ul style="list-style-type: none"> - Legal - Scalability - Ownership - Social aspects 	<ul style="list-style-type: none"> ○ What legal aspects is the CBM subject to? ○ How will ownership look like in the new CBM? ○ What risks does the CBM entail?

4.3 Expectations of Ex-ante Assessment Tools for CBMs

After interviewing the industry practitioners about what aspects they considered for assessing CBMs, they were asked about their expectations of an ex-ante assessment tool for CBMs. The interview participants were asked what insights they expected to gain from applying an ex-ante assessment tool, what functions a CBM assessment tool needs to fulfil, and what an ex-ante assessment tool need to provide to be of use to practitioners. The answers were mostly in line with what aspects practitioners stated they already use for the assessment but also went beyond that.

Practitioners expect an ex-ante assessment tool to reveal the financial flows of a CBM and provide a cost-benefit analysis. Interviewees further mentioned that an ex-ante assessment method should reflect on the company's internal capabilities and resources. They expect it to analyse competitors and their BMs and provide insights about customers and the target group of the CBM under assessment. Some interview participants also mentioned market assessment, which could entail further aspects such as trends, service providers, platforms and channels or circular solutions from other industries.

Environmental factors were frequently mentioned as a topic on which practitioners would like to gain more insights. The expectations here, however, go beyond only gaining knowledge on CO₂ emissions of the CBM under assessment, but also involve data about the life-cycle impact of products and the use of resources. Two of the interviewed practitioners (company B and organisations L) thus stated that they expect an ex-ante assessment tool for CBMs to deliver data about the CBM's material efficiency and resource effectiveness in the form of showing how many resources have been saved through the CBM compared to a linear BM. Receiving information about the CBM's displacement rate (how much new consumption does it displace?) and its utilisation rate (how much are the products actually used?) therefore are crucial aspects practitioners would like an ex-ante assessment tool to reveal.

Beyond these expectations, interviewees mentioned that they would want an ex-ante assessment tool to provide insights whether it delivers to B2B or B2C customers. Further, practitioners expect a CBM ex-ante assessment method to compare different CBMs and show opportunities how these can be connected within the company. Additionally, the interviewed companies mentioned that such an assessment tool should point out the scalability of the intended CBM and forecast its success.

From an internal perspective, practitioners expect an ex-ante assessment tool to reflect on the firm's target and what it aims to achieve with transitioning to a CBM: Does the company seek this change for a marketing or prestige purpose, does it follow certain trends in the market or is the motivation to transition the BM intrinsic? Company F further expects an assessment tool to provide insights of the CBM's strengths, weaknesses, opportunities, and threats, while interviewee B highlights that it should also evaluate the economic risks of the CBM under assessment.

4.4 CBM Ex-ante Assessment Checklist

Based on the themes and aspects considered by the interviewees and the expectations practitioners have in CBM assessment tools, presented in the previous chapter, a checklist was developed. The themes that were identified in chapter 4.2 and are displayed in table 4, represent the different BM elements the practitioners examine. The checklist groups the eight identified BM elements into three groups of internal, external, and 'other' elements. The group of internal elements looks at the resources and capabilities of a firm, the financial flows of the intended CBM and the suitability of products for the circular offering. In the group external elements, the partners and network of a

company are assessed, as well as the customer group targeted by the CBM and the market the firm operates on. In the last group other are the assessment aspects that evaluate the environmental dimension of the CBM under assessment as well as several other aspects such as legal aspects, scalability of the CE initiative and social aspects.

The intention of the checklist is to simplify the comparison and analysis of ex-ante assessment frameworks for CBMs for the outdoor fashion industry. This is done by checking if the BM elements practitioners assess, are addressed by the ex-ante CBM assessment tools, introduced in the literature review. The checklist examines if the elements are directly or indirectly assessed in the theoretical frameworks or not. It can, however, also be used to develop a new CBM ex-ante assessment tool for the focal industry. In this case the developed checklist can be applied as a guideline or formula of what an assessment framework needs to entail to meet practitioner's needs. Nevertheless, the checklist does not prescribe an order or ranking in which the assessment of the CBM has to be conducted, nor how it should be done in detail.

How the checklist is applied for the analysis of the ex-ante CBM assessment frameworks identified in the literature review, is described below in chapter 5.2.

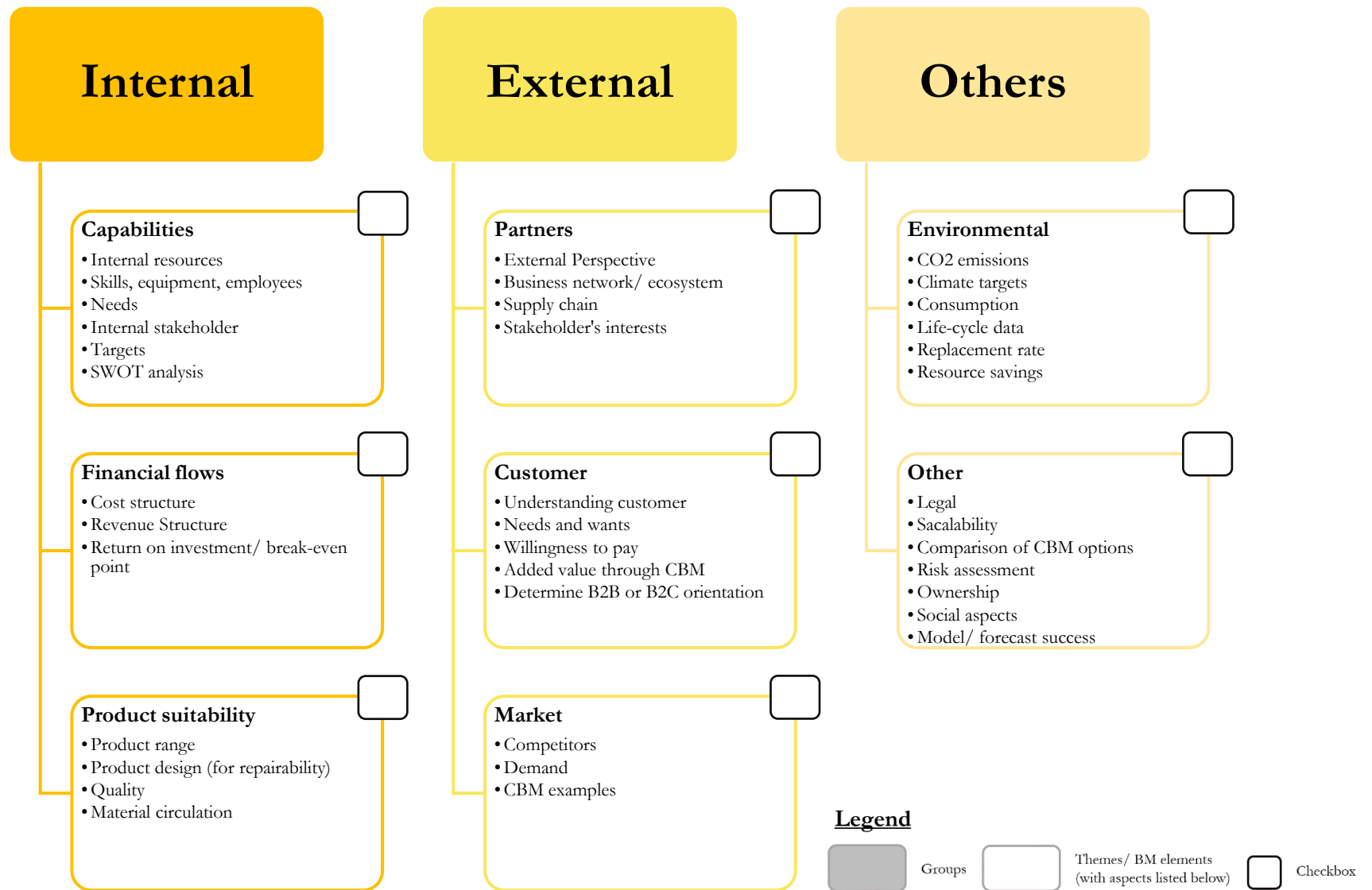


Figure 4 - Checklist for ex-ante CBM assessment tools.

5 Analysis of Practices and CBM Assessment Tools from Academic Literature

The following chapter puts the findings gathered in the previous chapter into the theoretical context. For this it takes up the three ex-ante assessment frameworks that were introduced in chapter 3.3.3 and compares them with the findings from interviewing practitioners and experts. First, the three frameworks are compared, and it is underlined what BM elements the tools address. Then, the three frameworks are applied to the checklist developed in the previous chapter one by one, and lastly, their performance is compared and analysed to provide an answer to RQ 3.

5.1 BM Elements Assessed by CBM Ex-ante Assessment Frameworks

The CBM ex-ante assessment frameworks presented in chapter 3.3.3 all assess CBMs from slightly different angles and therefore assess the elements of the BCM differently. The RCA by Bocken, Miller et al. (2016) focusses on the environmental impact of the CBM and investigates what effects the circular innovation has on the underlying socio-economic system. The SCEIA by Roos Lindgreen et al. (2021) and the SOA by Averina et al. (2021) frameworks instead take a more holistic approach and take into account economic elements such as customer demand and financial flows within the CBM.

SCEIA and SOA have the same starting point of determining the goals or vision of the company's CE initiative. The SCEIA framework further acknowledges the drivers and motivations that make the decision makers in the company aim for CE. The overall proceeding of the two frameworks is very similar, as (even though not in the same order) both frameworks assess the stakeholders as well as their interest and further evaluate the company's internal capabilities and perspective. Nevertheless, the frameworks apply a different depth of analysis of the internal perspective. The SCEIA framework looks at existing resource flows and impacts of key operations in the company, while the SOA checks to what extent the capabilities necessary for a CBM are available and how they can be accessed by the company. Likewise on the assessment of the external environment of the company under assessment, the SCEIA framework identifies the stakeholder and investigates how the implementation of a CE initiative impacts them. The SOA framework goes a different approach and assesses to what extent the partners in the firm's ecosystem are ready for a transition of the BM and how differing interests can be aligned with the focal company's interests.

The RCA as well as the SCEIA framework both emphasise a life-cycle perspective, and specifically address, evaluate, and quantify the environmental impacts of the circularity endeavour. The SOA, however, views a sustainability opportunity, which the authors define as "an idea focused on a more sustainable and resource-efficient solution" (Averina et al., 2021, p. 1) as the starting point and thus prerequisite of the entire assessment process. Furthermore, the SOA is the only of the three presented frameworks that takes the financial flows of the intended CBM into consideration. The other two assessment frameworks both lack this step completely, which (most likely) is because SCEIA was not specifically intended to assess CBMs, but rather various types of CE strategies and RCA solely focusses on the environmental assessment of a CBM.

Despite the identified similarities and differences, it is worth noting that the three introduced assessment frameworks are designed for different fields of application and thus set different foci. The RCA's approach focusses on the environmental perspective of the assessment and leaves out economic elements, as it is specifically designed to evaluate the environmental performance of a CBM. The SCEIA framework on the contrary was developed to support decision

makers in finding the most suitable CE strategy for the company in focus by providing an assessment tool that can be applied to different CE strategies, which among others includes CBMs. Then again, the SOA framework was designed as a decision support tool that assesses how a sustainability opportunity can be realised through a CBM, by revealing potential challenges and bottlenecks. All three frameworks are summarised in box 4 below.

5.2 Application of Checklist

In the next step the checklist that unfolded from the analysis of the assessment aspects and expectations described in chapter 4.4 is applied to the three assessment frameworks introduced in the literature review (chapter 3.3.3). The intention is to allow to examine to what extent the presented frameworks cover all BM elements that were considered by the practitioners for the (ex-ante) assessment of CBMs. Comparing and analysing each framework's performance with the help of the checklist therefore provides insights about the suitability of each ex-ante assessment framework in the focal industry. An ex-ante assessment tool can be defined as suitable for the application in the focal industry if it addresses all or most of the elements included in the checklist. As these elements were derived from what practitioners currently assess and what they expect from an ex-ante assessment tool this chapter provides an answer to RQ3.

The BM elements under assessment are displayed in eight boxes, grouped in internal, external, or other. In the top right corner of each box there further is a small square in which the respective BM element can be ticked off (✓) if addressed in the ex-ante assessment framework in focus or crossed out (X) if not addressed. The third option is a grey tick (✓) to indicate that the element is only indirectly addressed in the framework.

RCA

- Slowing effects
 - Measures to extend product life; address production output, consumption and ownership
- Closing effects
 - Recyclability and recycling rate; reduce waste
- Life-cycle effects
 - Value chain impacts; efficiency increases; reduce environmental impact
- System effects (wider impacts of CBM innovation)
 - Material flows in the system; rebound effects; changes on stakeholder and society; effects on multiple CBMs

SCEIA

- Motivation and target
- Vision of CE initiative; formulate goal
- Stakeholder identification
- Internal resources and energy flows
- Current system in company
 - Key operations and processes
 - Impacts of key operations
- Screening for solution; assess market and other industries
- Compare different CBM options (iteration)

SOA

- Target; vision
- Internal capability assessment
 - Competencies; available resources
 - Needs uncovered and acquirability of lacking resources in current ecosystem
- Partner mobilisation
 - Ecosystems readiness and alignment
 - Stakeholder interests analysis
- Cost-revenue flows
 - Customer benefits
 - Customer's willingness to pay
- Market analysis

Box 4 - BM elements of the three assessment frameworks.

5.2.1 Performance of the Rapid Circularity Assessment

The Rapid Circularity Assessment (RCA) by Bocken, Miller, et al. (2016) addresses only two of the eight elements of the checklist. By looking at the recyclability of the product in focus and strategies to extend its life span or circulate resources in loops, the RCA framework covers the topic of product suitability. It further measures which impact the CE strategy under assessment has on the environment and how the intended CBM affects consumption and resource use. With the latter one, the RCA also addresses the environmental dimension of the checklist.

The RCA, however, does not cover the remaining six elements and therefore does not address essential parts of the checklist. The framework does not take financial flows nor a company’s external landscape into consideration but assesses the environmental effects of the product or service offered through the intended CBM on a systemic level. It can therefore be summarised as being a tool that dives deep into the assessment of the environmental dimension of the CBM to the expense that it does not consider all aspects that were important for practitioners in the outdoor fashion industry.

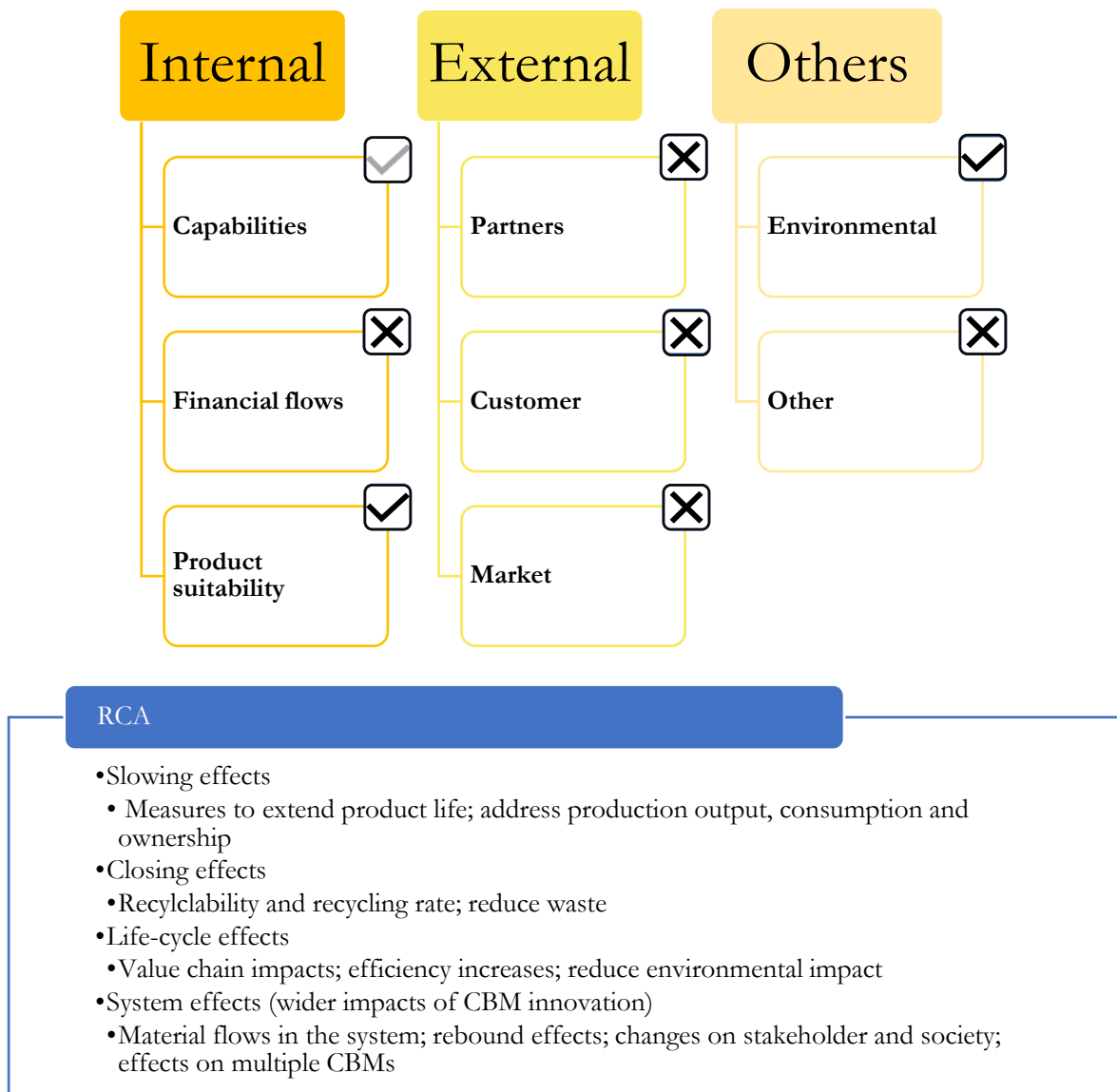


Figure 5 - Checklist and summary box of the RCA framework

5.2.2 Performance of the Strategic Circular Economy Impact Assessment

The Strategic Circular Economy Impact Assessment (SCEIA) by Roos Lindgreen et al. (2021) covers all the elements of the checklist directly or indirectly except for the assessment of financial flows. The SCEIA framework assess a company's internal resources and capabilities by looking into the processes and resource flows within the firm. External stakeholders are further identified in one of the first steps of the assessment framework. Their interests are gathered and then ranked in a materiality assessment. As the assessment phase development of a vision also addresses strengths, weaknesses, opportunities and threats of the CE initiative under assessment, the SCEIA framework covers the element of the market which practitioners identified as an important aspect. SCEIA further includes a step in which the market is screened for the most suitable CE strategy for the company in focus, which also includes investigating the conditions of the market the firm is operating in. The assessment of the environmental dimension is at the centre of the SCEIA framework, as the BM's resource and energy flows are identified and quantified early on and a thorough life-cycle assessment of the product or service in focus is conducted.

Even though the SCEIA framework takes into consideration the total costs associated with the life-cycle of a product or service by integrating life-cycle costing techniques into the assessment framework's methodology, it does not conduct an assessment of the financial flows of the intended CBM. The revenues generated by the CBM and the costs occurring within the company or for stakeholders, are not put into relation. Moreover, the framework does neither provide information about the profits or losses of the CBM under assessment, nor when the break-even point of the BM transition is achieved. The SCEIA framework thus does not sufficiently acknowledge financial perspective of the CBM.

The remaining three assessment elements are only partially covered in the assessment SCEIA framework. The element product suitability is not directly addressed, but it is covered through identifying the firm's significant energy and resource flows as well as the company's impacts. SCEIA further forecasts how these impacts change with adaption of the CBM in focus.

Moreover, customers are not directly mentioned by the SCEIA framework and therefore do not take the same priority as what the interviewed practitioners ranked it as. They are, however, indirectly addressed in the first step, which identifies drivers and motivations for the company to transition the BM and can further be included as an interest group in the stakeholder analysis and materiality assessment of the SCEIA framework.

Lastly, two of the aspects listed under 'other' are addressed in the framework. Social aspects are addressed by the fundamental understanding of the framework that the CE initiative is only valuable, if all three sustainability dimensions are addressed. Furthermore, due to its iterative structure, the SCEIA framework enables the comparison of different CE options and allows a direct comparison of these.

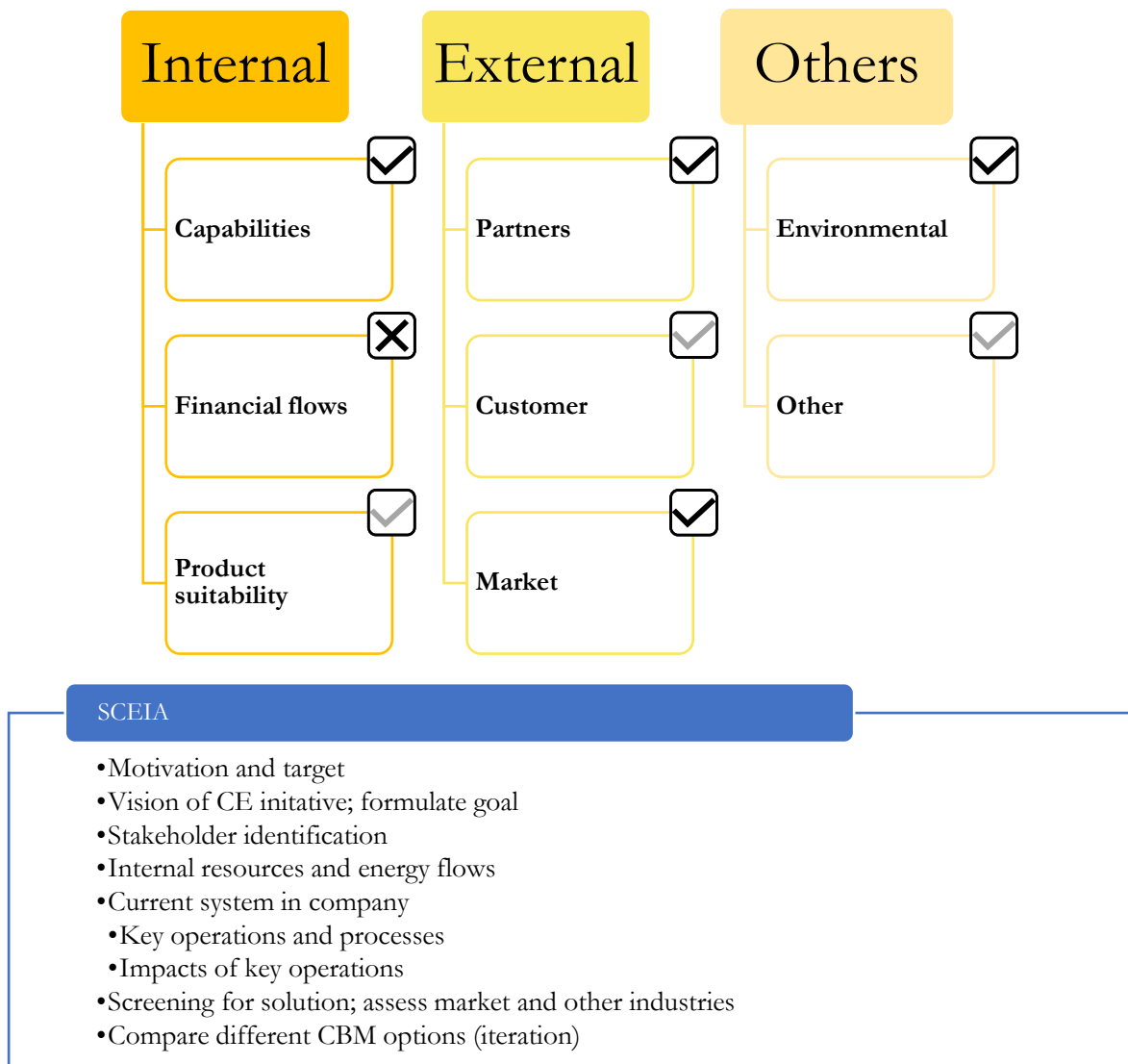


Figure 6 - Checklist and summary box of the SCEIA framework

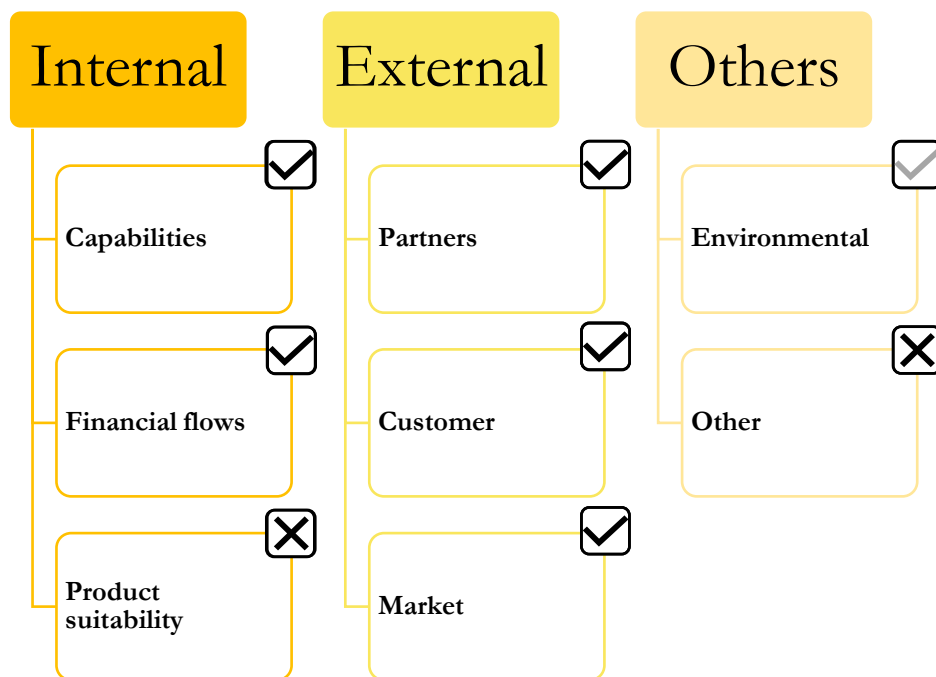
5.2.3 Performance of the Sustainability Opportunity Assessment

The Sustainability Opportunity Assessment by Averina et al. (2021) includes almost all elements addressed in the checklist. Only product suitability is not covered, and an environmental assessment is only indirectly addressed by the SOA framework. Its starting point is an internal capability assessment in which the company's competencies and abilities to exploit the identified sustainability opportunity through a CBM are evaluated. For this a company needs to assess what requirements for the realisation of the CBM in focus it can cover by itself, and which resources or competencies are currently lacking in the company and or its ecosystem. Independently of whether or not the competencies and resources are available within the firm, the SOA framework takes the applying company through a step in which the readiness of the organisation's ecosystem is evaluated. It checks whether the partners in the firm's network can compensate for competency lacks and further makes sure that sustainability benefits in all three dimensions are realised for all involved parties.

Such a holistic perspective is also expanded to the assessment of the customer group, by assessing whether the consumer financially benefits from the CBM under assessment. Moreover, the SOA examines whether the customer is willing to pay for the product or service and addresses the market element of the checklist by investigating whether there is a significant (customer) demand for the CBM under study. This comes with a market analysis that also includes

scanning for public financial incentives in the market. The SOA framework further takes into consideration how the value that is created by the intended CBM can be captured by the company. Therefore, assessing the cost and revenue flows is an essential step in the SOA, which further assesses if the expected financial benefits for partners in the company's ecosystem are higher than their costs of committing to a transition to CE.

The environmental dimension is only indirectly addressed in the SOA framework, as there is no step in the framework's assessment process that evaluates the impacts on the environment. However, the SOA framework presumes the existence of a sustainability opportunity, and thus requires an "idea about how a focal company can improve the environmental, social, and economic value of products, services, and processes" (Averina et al., 2021, p. 2). Even though this definition contains environmental and social aspects, the SOA framework does not conduct a detailed assessment of environmental or social aspects of the CBM in focus. Besides that, the checklist element of product suitability is not addressed none of the aspects listed in 'other' are neither directly nor indirectly mentioned in the SOA.



SOA

- Target / vision
- Internal capability assessment
 - Competencies; available resources
 - Needs uncovered and acquirability of lacking resources in current ecosystem
- Partner mobilisation
 - Ecosystems readiness and alignment
 - Stakeholder interests analysis
- Cost revenue flows
 - Customer benefits
 - Customer's willingness to pay
- Market analysis

Figure 7 - Checklist and summary box of the SOA framework

5.3 Analysis of CBM Ex-ante Assessment Frameworks

All three assessed frameworks cover the elements addressed in the checklist only partially and none of the three frameworks covers all the elements. While the RCA covers the environmental dimension of CBM in depth and provides significant details about the effects of the CBM on the underlying socio-economic and environmental system, the framework does not consider the economic aspects, nor the structural organisation of the company that applies it. This is due to the fact that the RCA framework was designed to assess the environmental impact of a CBM only and thus does not meet all expectations of the interviewed practitioners.

The SCEIA framework covers most of the elements of the checklist but does not consider the financial flows of the CBM under assessment. Thus, it misses out on an essential part of assessing a BM, as the framework does not reveal whether the CBM generates profits or causes a loss for the company. Especially on a long-term perspective the lack of knowledge about the financial viability of the CBM can turn out to be problematic. From a business standpoint this is a key factor, as it could hinder the dissemination of CBMs if the implemented in a way that they are not profitable. This shortcoming of the SCEIA framework is because of the broad field of application of the framework, which was designed to assess a variety of CE strategies on company level which among other CE solutions includes CBMs.

The SOA framework covers most of the elements on the checklist too. It, however, lacks a clear identification and quantification of environmental impacts of the CBM under assessment. Even though a sustainability opportunity is understood as the starting point of developing a CBM, the environmental dimension does not take a central perspective in the SOA framework. Furthermore, the SOA framework makes it difficult for the firms applying it to directly compare two or more CBM options with each other. Even though designed as an iterative process that leads the applicer back to previous phases if one assessment step turns out negative, the framework does not allow to compare two alternatives, nor does it apprehend how different CBMs could work within one company.

To answer RQ 3, it can be concluded that both SCEIA and SOA are frameworks that cover most of the elements of the checklist created in chapter 4.4. This means that these two frameworks address most of the aspects practitioners from the outdoor fashion industry need in a CBM ex-ante assessment framework for them to be useful and applicable. The RCA, however, has the significant shortcoming of not considering most of the elements which practitioners stated during the interviews.

While all of these frameworks have their shortcomings, they can be used for different purposes or can be combined with each other. SOA for example could be adapted to expand on assessment steps to identify and quantify the environmental impacts of a CBM, by adding the RCA to the end of the assessment process. However, none of the frameworks addresses the topic of scalability, which highlights the problem many practitioners voiced that they find it difficult to scale up their CBM initiatives to a larger scale.

6 Discussion

The CE has been identified as an approach that tackles environmental issues such as resource depletion and waste generation, while at the same time enabling sustainable growth and human well-being. Many societal actors are involved in the transition towards CE, whereat companies will play a decisive role by creating circular solutions for consumers. Therefore, much research has been put into how firms can generate value out of CE solutions and how to develop successful CBMs. Assessing a CBM's feasibility, scalability and performance is an essential part of the CBM development which needs to be conducted by business developers or other decision makers in a company. Nevertheless, the knowledge about how organisations can assess CBMs prior to their implementation is scarce and remains an underdeveloped research field.

6.1 Academic Knowledge about Ex-ante Assessment Tools for CBMs

Assessing circular activities allows companies to understand (and quantify) the true environmental impacts of their CBM (Roos Lindgreen et al., 2022) and enables firms to check for unintended rebound effects (Harris et al., 2021). Moreover, it is essential to evaluate if there is any profit generated through the CBM, which will reveal its long-term viability and scalability. Assessment tools are an important tool for decision makers in companies which need to be able to make an informed decisions that is based on an objective assessment (Averina et al., 2021).

The literature review conducted in chapter 3 found that the existing academic literature in this field has been developed very recently and that only few tools address the topic of CBM assessment from an ex-ante point. Most of the tools that allow an evaluation of CBMs take an ex-post approach and thus evaluate a CBM after its implementation. Since transforming a company's BM involves major changes and could entail a re-allocation of a firm's resources (Averina et al., 2021), decision support tools that can be applied before establishing a CBM are needed (Manninen et al., 2018). Chapter 3.3.3 thus has identified three ex-ante assessment frameworks that were designed to assess CBMs prior to implementation. The existing frameworks are the Rapid Circularity Assessment (RCA) that assesses the environmental impact of CBMs, the Strategic Circular Economy Impact Assessment (SCEIA) which assesses impacts of company level CE activities, and the Sustainability Opportunity Assessment (SOA) which assesses whether a CBM can successfully exploit a sustainability opportunity.

These three assessment frameworks are described in detail in chapter 3.3.3 and form the theoretical foundation of the analysis in chapter 5.

6.2 Ex-ante CBM Assessment in Practice

To investigate to what extent these tools are applied in practice and how organisations assess CBMs in real life, the outdoor fashion sector was defined as object of study. For this, practitioners from the outdoor fashion industry in Scandinavia and Germany were interviewed and asked how they analyse CBM options prior to implementing them.

The results of these interviews showed that outdoor fashion brands that established CBMs did not assess them prior to their implementation. No thorough ex-ante assessments of the CBMs were conducted by the interviewed firms. These findings fall in line with findings from Das et al. (2021) who state that companies rarely forecast the impact of their CBMs before implementation, due to a lack of concrete data and knowledge about CBMs.

Furthermore, the ex-ante assessment frameworks currently discussed in the academic literature were not known to the practitioners. The interviewed representatives of two outdoor industry associations and an EPA demonstrated to have a more holistic overview over existing CBM development and modelling tools and emphasised their importance for companies that seek to

transition their BM. While they highlighted the usefulness of online toolkits and implementation roadmaps, they were also unaware of the ex-ante assessment tools that were introduced in this thesis. Despite the fact that the RCA was developed in cooperation with a textile retailer as a case study, the framework has not yet been applied among the interviewed firms. The findings indicate a low dissemination of the three CBM ex-ante assessment frameworks in the focal industry, since they are neither applied nor known by practitioners. This could be due to the fact that they were designed very recently (one in 2016 and the other two in 2021), that the pandemic slowed down their dissemination or that the frameworks or that they do not meet the needs of practitioners.

Several interviewed practitioners and experts from the outdoor industry have stressed the need of experimenting with CBMs and piloting circular ideas in a small scale. Interviewees stated that CBM experimenting is guided by a learning by doing approach which enabled companies to evaluate their CBM as they develop it and allows them to flexibly adapt it. The potential of CBM experimentation as “an approach to explore and validate the different possibilities that a business could create value from and understand what works in a real-life business context to significantly reduce the natural resource needs of business while creating positive value for customers, wider society and the environment” (Bocken & Antikainen, 2019, p. 247) has been identified by the interviewed practitioners. Thus, the ex-post assessment of CBM-pilots is more common and perceived as easier for companies, as they can make decisions on past performance data, rather than base them on assumptions or forecasts about the future. Furthermore, as Bocken et al. (2018) found, CBM experimentation creates internal and external engagement which prepares different stakeholder of a company for the transition to a more sustainable BM.

All the firms that were interviewed in this research, described that they experimented with CBMs, though none of them has transitioned the entire company to a CBM. Circular offerings are thus only established as a secondary BM alongside the existing linear BM. One could argue that this leads to the consequence that firms do not have enough incentives or motivation to scale up their CBM, if the main revenues are still generated through a linear BM. Most of the established CBMs in the interviewed firms can therefore be described as a diversification of the current BM, which aims to address new customers by offering circular services or products, without major changes in the existing organisation’s (linear) BM (Geissdoerfer, Vladimirova, et al., 2018). This becomes even more evident, as firms like company E and F see customers renting their products as a potential customer for buying a product in the future.

However, as one interviewee stated, the company identified that transitioning to circular solutions within the next 10 years will be vital for the company’s existence and thus more thorough changes are needed to transition to a CBM. This shows that small scale CBM experimentation is an approach to circularity that is used by incumbent firms to trial new ways of doing business while reducing their environmental footprint, but also to remain competitive in a changing market (Das et al., 2021). Firms can, however, not entirely rely on experimenting and need to find ways to successfully develop, assess and scale up their CBM.

As for this reason, interviewee L emphasised that companies in the focal industry are in the need of guidance tools or roadmaps that can help them establish CBMs. The interview participant further highlighted that guidance is currently more needed than assessment tools, since it is difficult for practitioners to make accurate assessments and forecasts, when so many unknown factors are involved. Companies therefore do not conduct the step of assessing their CBM because it is often not fully developed prior to piloting it. As Das et al. (2021) already pointed out, a lack of enough data and a lack of knowledge about the intended CBM pose the major barriers for practitioners. Furthermore, different interviewed practitioners stated that many

organisations do not have the necessary resources and time it takes to investigate the topic of CE in depth and thus cannot raise the capacities to assess the CBM prior to implementation.

Nevertheless, guidance tools that support companies in developing and implementing CBMs will not be enough. Guidance needs to steer the company towards a successful CBM and therefore needs to anticipate and assess whether the CBM in focus will be feasible and worth investing the company's resources or not. Based on the same reasoning Averina et al. (2021) and Lindgreen et al. (2021) emphasise that evaluating the early assumptions of a CBM is essential in meeting the right strategic decisions and secures success in subsequent steps of CBM implementation.

It therefore needs decision support tools that provide assistance in assessing the sustainability performance of a firm's circular solution. However, there is no consensus among researchers how exactly an upfront assessment shall be conducted and what aspects and criteria need to be investigated to evaluate the future viability of a CBM (Averina et al., 2021). For that reason, practitioners from the focal industry were asked about what aspects, categories, and BM elements they assessed in their CBM.

6.3 Assessed Aspects

From the interviews the aspects and assessment criteria were gathered, from these a list of codes emerged which were grouped into eight themes that mirrored the assessed BM elements. The three themes internal capabilities, financial flows and product suitability represent the group of internal CBM elements; network partners, customers and market made up the group of external CBM elements and the environmental dimension as well as other aspects like scalability, legal requirements or social aspects were grouped into 'other'.

The elements that were defined in this research mirrored the typical BM elements that are discussed in management and business development literature. The assessment themes in the group internal CBM elements take an approach that is based on Barney's (1991) resource-based view on the company's CBM initiative by examining which capabilities, skills and core competencies the firm can exploit with its CBM and how they can be employed to gain a significant competitive advantage. The group of external elements in the checklist take a market-based perspective as it takes Porter's (1980) five market forces into account. Thus analysing the threats from market competitors as well as the power of suppliers and customers are assessment steps which address the external landscape of a CBM under assessment.

The eight CBM elements that were assessed by the interviewed practitioners resemble the nine building blocks a BM consists of according to Osterwalder and Pigneur (2010). Averina et al. (2021) highlights that capability assessment, ecosystem alignment and value capture viability display the core elements for an assessment of a sustainability opportunity prior to CBM design and development. These three key categories are equal to the elements internal capabilities, network partners and financial flow that were identified in chapter 4. Even though there are significant similarities between the assessment aspects practitioners consider and the BM literature, it was not covered in the interviews and in this research, whether or not the interviewees are aware of the BM modelling literature.

However, the list of assessment aspects generated from interviews (see table 4) indicates that the underlying understanding of the economic system is based on linear thinking. Even though the companies evaluated their CBMs, the assessment was not expanded to each life-cycle step of the product as suggested by Nußholz (2018). Assessing multiple life-cycles and all life-cycle stages of a CBM's product or service, generates a greater and more holistic picture as it takes

into account the long-term perspective and the CBM's effects from operations outside the company's operations.

6.4 Suitable Tools to Assess CBMs Prior to Implementation

Out of the assessment aspects and themes that evolved from the interviews and the expectations practitioners have in CBM ex-ante assessment tools, a checklist was generated. This checklist was designed to examine the currently available ex-ante assessment frameworks (introduced in chapter 3.3.3) and to check whether they assess the same BM elements as the practitioners require. The checklist was then applied to the three frameworks and evaluated which of them fulfils the needs of practitioners in the focal industry best.

Even though, the results show that none of the three examined assessment frameworks covers all elements of the checklist, the tools can be of great use to practitioners in the outdoor fashion industry. Literature and practitioners emphasise that CBM assessment requires a holistic perspective on the company in focus and the economic system surrounding it. It therefore makes sense to take a market-based view on the basis of Porter (1980) and examine the firm's position in the market, its targeted customer group and its ecosystem partners and forecast how these aspects change with the transition to a CBM. Moreover, a resource-based view as introduced by Barney (1991) can support a company in determining what resources and capabilities the company has within its influence and how they can be used to sustain a competitive advantage. Out of the investigated ex-ante assessment frameworks, only the SCEIA and the SOA frameworks take such a broad and holistic perspective.

While the RCA framework performs well in evaluating the environmental dimension of the CBM under assessment and investigating its impacts on the broader system, it does not address the economic perspective of the CBM and cannot provide insights about financial flows, internal capabilities, or external partners. The SCEIA and SOA frameworks instead cover most of the elements addressed by the checklist and only have minor shortcomings. The SCEIA does not address the financial flows of a developed CBM and only indirectly covers the elements product suitability and customers. However, it provides a detailed assessment of the environmental impact, the stakeholder's interests and enables a broad range of application of the framework. The SOA framework covers most of the BM elements of the checklist, except for the assessment of the product suitability for the CBM. It further addresses the environmental dimension only indirectly and none of the themes gathered in the 'other'.

However, literature and practitioners emphasise that it is essential for a CBM assessment tool to shed a light on the financial flows of the intended CBM, as it otherwise does not show whether the CBM generates revenues for the company and is viable on a long-term perspective or not. Financial viability of an intended CBM was described as prerequisite for the implementation of a CBM by interviewee B. Similarly Averina et al. (2021) argue that companies need to assess whether the CBM is worth investing in or not. Thus, knowledge about the financial flow of a CBM can be seen as an essential element that needs to be addressed by a CBM ex-ante assessment tool.

Furthermore, the environmental perspective of a CBM needs to be addressed by an ex-ante assessment framework or else the true impact of the CBM on the environment remains unknown. Blum et al. (2020) point out that "recirculating more material is not necessarily more sustainable", so that science-based methods to assess the environmental performance of CE initiatives are needed (Harris et al., 2021). It therefore is important that a CBM ex-ante assessment tool examines whether the intended CBM actually helps circulating and saving resources or whether rebound effects annihilate resources savings efforts.

Similar reasoning could be argued for all of the eight identified BM elements, as every company and every interviewee laid a different focus. The different professional backgrounds and experience further caused that the interviewees emphasised some aspects more than others. It was beyond the scope of this research to investigate which of the BM elements the practitioners prioritise the most and which ones they deem less important when assessing a CBM prior to implementation. The strategic corporate development (and sustainability) manager of company B, for example, emphasised the importance of knowing financial flows of the CBM, while the Sustainability Manager of company D stressed that the firm needs to gain more knowledge about the environmental impacts to conduct a thorough assessment of their CBM.

This further applies to the educational background and knowledge the interviewed practitioners had about CBMs and their assessment. The interviewees had varying understandings of what a CBM entails and how the CBM adds value for the company. One interviewee (company G) stated that they perceive a CBM only as a BM if it generates profits, which the CE initiative established by company G did not achieve yet. Several companies stated similar understanding of CBMs and highlighted that they do not view their circular initiatives as BM, but rather as an entrepreneurial way of addressing environmental challenges. Since the circular activities of the company are not identified as CBMs, often companies do not see the need to conduct a thorough assessment of them. Especially as most interviewed companies are still experimenting with CBMs and do not invest their full resources and effort into the CBM, they are not expecting large returns, but rather view it as possibility to learn about CE solutions for their firm.

While it is true to a certain extent that a CBM that does not generate profits is not a BM, it can still create other forms of value to the company to fit the definition of a BM (see chapter 3.2.1). This added value does not necessarily need to be monetary value, but could also be an increase in customer loyalty, resource efficiency or indirect cost reduction for the company implementing it. The understanding among practitioners of what a BM is, needs to be aligned or needs to be shaped out better. Nevertheless, a CBM that does not provide positive value to the organisation, is most likely not feasible and will not prevail in the long run.

After all, businesses, even when tackling sustainability challenges by establishing CBMs still largely focus on growth of their business. The CE presents an opportunity of a new economic system that is rooted in sustainable growth which enables future generations to thrive on resources and live in a healthy environment. However, the economic growth paradigm is predominant in today's business landscape and also remains unquestioned in the pursue to transition to a CE. As one interviewed expert pointed out, it is extremely difficult for CBMs to compete with linear ones. While linear BMs are simple and cheap for both consumer and retailer, CBMs include all costs and thus also the costs for (protecting) the environment, which often makes them more expensive and less attractive to consumers. Societal change towards a post-growth society, BMs that that focus on sufficiency and circular solutions which provide new value will be necessary to conduct fundamental change of the way we consume, and the way companies create value.

The checklist developed in this thesis can further be applied to design an ex-ante CBM assessment tool that fulfils all the needs of practitioners. Although the checklist provides a range of different topics that should be assessed, it does not indicate in which order to apply and assess what. Which topics have priority over others or what to do when there are trade off situations, are issues that need to be addressed by future research to guide practitioners in the focal industry and beyond to the most suitable CBMs. Until then, the checklist can be a tool practitioners can apply to obtain an overview over the BM elements of their planned CBM and keep track of what elements they should assess.

6.5 Reflections on the Research Project

6.5.1 Reflections on Methodology

The qualitative methodology of this research project was suitable, given the aim of the thesis to investigate which ex-ante assessment tools for CBMs are useful for practitioners in the focal industry. For this, the existing ex-ante assessment frameworks were identified in a literature review first and subsequently practitioners were interviewed. A qualitative approach was chosen, because it allowed to investigate the experience and viewpoints of the interviewees deeper, to engage into an insightful conversation about CE in the companies and to ask follow-up questions.

Although quantitative methods could have gathered data from more study participants they were not considered, as they would not have allowed this level of detail and direct engagement with the participants. As the research field on CBMs and assessment methods for CBMs is very young, the researched terminologies and concepts are not widely known in the industry and might need clarification. A quantitative survey would face the problem that unclear definitions could cause confusion among the study participants and lead to flawed responses which consequently need to be rejected from the data set. However, quantitative data collection methods can be used for future research to research the ranking of the assessed aspects and gain an understanding about what criteria practitioners prioritise and which are of lesser importance to them.

The research focus on ex-ante assessment tools for CBMs further predetermined the project's focus on qualitative assessment tools instead of quantitative tools. Qualitative assessment methods focus on understanding the available and missing elements of an intended BM and aim to reveal relationships and challenges within the system. Quantitative assessment methods on the other hand, aim to generate quantifiable data and forecast a CBM's environmental or economic performance in numbers. Due to the fact that no data has been created prior to the implementation of a CBM and thus quantitative data would merely be based on assumptions, the research project disregarded quantitative assessment methods.

The literature review of this project focussed on ex-ante assessment tools for CBMs in the academic literature and only slightly touched upon grey literature. During the literature search for this research project, the author did not encounter significant assessment tools in the grey literature that were suitable for comparison. Moreover, except for one expert, the interview participants did not know about any available development or implementation toolkits from academic nor from grey literature. Thus, ex-ante CBM assessment tools from grey literature were not further investigated in this project. Moreover, the grey literature toolkits introduced in chapter 3.3.1 were designed for companies to start engaging with CBMs and develop a CBM from scratch, rather than for specifically the ex-ante assessment of CBMs.

6.5.2 Reflections on Legitimacy and Transferability of the Findings

This thesis project focussed on incumbent firms that strive to transition to a CBM, as its aim was to understand what aspects and categories practitioners consider when assessing. Circular start-ups were therefore excluded from this research, as start-ups do not face the same situation as incumbent firms. Nevertheless, also start-ups founded with a CBM can (and should) assess their intended CBM prior to implementation to forecast the company's financial viability and evaluate its environmental impacts. To what extent the findings of this thesis are transferable to circular start-ups remains unknown and thus, it needs to be addressed by future research how circular start-ups evaluate their CBM before entering the market.

All of the interviewed companies offer apparel products as well as other outdoor goods, such as gear, tents or backpacks and the interviewed experts collaborate with many different brands in and beyond the outdoor fashion sector. Thus, the lines between apparel and other outdoor products were not always drawn clearly and became indistinct. During the interviews the practitioners did not clearly differentiate between CBMs for apparel products and other products, as the CE activities often are very intertwined here. Since the practitioners shared their insights and experience with assessing the CBM, the lack of differentiability between different products did not affect the findings from the interviews, nor results of the project.

Moreover, the findings from interviews were influenced by the position and internal perspective the interviewee has. Depending on what background, what knowledge and what education the interviewee has, different aspects were chosen for the assessment and different criteria were highlighted during the interviews.

The findings gathered in this project can be transferred to other industries under reservations. The research sets a clear picture of the current situation of CBM assessment among firms in the outdoor fashion industry in the Scandinavian and the German market. The findings can therefore be generalised to the entire sector in the focal countries. Further, no indication of any adjacent industries being much more advanced in this research field or setting completely different foci was observed. Interviewees from other sectors might emphasise different aspects in the ex-ante assessment of CBMs or firms in other industries face different conditions. Nevertheless, since the assessment themes identified through interviews with experts and practitioner are widely in line with the BM elements debated in literature, it can be expected that the BM elements assessed by practitioners in other industries will be similar to the findings from this research. The transferability of the findings to other cases or other industries therefore needs to be investigated in future research.

7 Conclusion and Recommendations

As the recognition of environmental challenges such as resource depletion and pollution in the mainstream perception increase, the CE was identified as a pathway for tackling these issues while simultaneously fostering sustainable growth. More and more societal actors have realised that the engagement of the private sector into the transition towards a CE is crucial and thus new BMs that are profitable for companies, save resources and the environment and offer attractive products or services to consumers are evolving. While much research is done on the field of these new CBMs, companies still struggle to systematically assess which CBM is most suitable for a firm's circumstances and thus worth implementing.

As part of this research project, practitioners from nine companies from the outdoor fashion industry in Scandinavia and Germany as well as three industry experts were interviewed. The research questions that were introduced in chapter 1.3, among other questions, asked about how firms assessed their CBM prior to implementation. In line with previous research by Das et al. (2021), the findings in chapter 4 show that the interviewed companies did not forecast or assess the CBM's economic viability, nor environmental effectiveness prior to establishing it. Further, none of the three ex-ante CBM assessment tools that were identified in the literature review (in chapter 3) were applied, nor known to the interviewees from the focal industry. It can be assumed that the few existing frameworks that were developed in recent years, are too new to be widely disseminated in the industry.

Industry practitioners and experts, however, emphasise the importance of experimenting with CBMs and testing out new circular solutions that can then be scaled-up in the future. Most of the established CBMs of the interviewed companies do therefore not generate profits, but rather allow firms to gain experience with CBMs and continue refining them. CBM experimentation therefore provides a safe risk-free testing space for companies, where they can develop new ways of creating value for the company while simultaneously creating positive value for the wider society and the environment (Bocken & Antikainen, 2019).

When asked what aspects or categories practitioners focussed on when assessing the implemented CBMs and what expectations they have in an ex-ante CBM assessment tool, the interview participants mentioned several aspects that were coded and grouped into eight themes, which represent the BM elements assessed. Three of these themes make up a group of internal BM elements competencies, financial flows and product suitability, while three other elements present the group external elements with partner network, customer group and market analysis. The remaining two groups were the environmental dimension and the group of other aspects such as social and legal aspects or the scalability of the CBM in focus. Out of these identified elements the author developed a checklist which allows to analyse ex-ante CBM assessment frameworks.

The developed checklist can be applied to design an ex-ante CBM assessment tool that fulfils the needs practitioners raised in this research project. It can do this by providing an overview over the BM elements such a tool needs to entail to be of practical use to practitioners (in the focal industry. Furthermore, the checklist can be a tool practitioners can apply to obtain an overview over the BM elements of their planned CBM and keep track of what elements they should assess.

The comparison of the three identified ex-ante CBM assessment frameworks and their application to the developed checklist showed that none of them covered all BM elements of the checklist. Roos Lindgreen et al.'s (2021) SCEIA framework and Averina et al.'s (2021) SOA framework covered most of the BM elements of the checklist, but still had minor shortcomings and different levels of depth of the assessment. Even though both frameworks cover different

aspects and have different foci, they are suitable methods to assess a CBM option by taking into account a market-based view (Porter, 1980) on the company as well as a resource-based view (Barney, 1991) on a firm's internal capabilities.

Nevertheless, it was highlighted that it is important to assess a CBM's environmental performance prior to its implementation to evaluate whether the intended CBM actually promotes resource circulation or saving or whether its savings are countered through unintended rebound effects. Furthermore, it was emphasised that the financial flows of a CBM need to be addressed by an ex-ante assessment tool to reveal early on whether a circular idea is worth investing in and find ways to scale up the CBM. In the end, as one interviewee stated, "you can have a great idea, but unless you cannot make any money, then it won't be any business".

7.1 Recommendations for Practitioners in the Outdoor Fashion Industry

Practitioners from brands that want to transition to CBM as well as business developers or consultants are well advised to apply assessments of their intended CBM prior to its implementation. The existing ex-ante assessment frameworks analysed in this thesis provide a good foundation for companies that are transitioning towards CE. Especially the SCEIA and the SOA frameworks (introduced in chapter 3.3.3) cover most of the categories addressed by the interviewed practitioners and are thus recommended to practitioners for the use of ex-ante CBM assessment. Additionally, companies can apply the checklist developed in this thesis as a tool to check if they assessed all the BM elements listed and addressed them in their assessment. Even though the interviewed firms stated that they generated important learning from CBM experimentation (without prior CBM assessment), it is recommended that a company's CBM experimentation is guided by a thorough ex-ante assessment of the CBM the company wants to implement to avoid channelling resources into a CBM that is not suitable to the firm's circumstances. This guides the CE efforts into the right direction from the beginning, saves resources and reveals implementation pitfalls early on.

7.2 Recommendations for Experts in the Outdoor Fashion Industry

Even though there is already strong cooperation among different firms and actors in the outdoor fashion sector (according to the interviewees) further facilitation of collaboration between different brands, suppliers and subcontractors will be necessary. It is therefore recommended to overcome pure competitive thinking in the industry and develop learnings from and with CBMs in a mutual way. A decisive role in this will be assigned to experts and information brokers from industry associations or EPAs. Thanks to their position as an intermediary between different companies, different industries, and academia they need to bring the right actors together to foster experience sharing in new productive relationships and help to disseminate new knowledge about CBMs, their implementation and how they can be assessed.

7.3 Recommendation for Future Research

This thesis found that companies in the outdoor fashion industry are currently not assessing their CBMs prior to implementation as they lack an assessment tool which includes all elements practitioners deemed essential. However, interviewed practitioner emphasised the need for tools that enable decision makers in companies to assess CBMs early on and support the development process by providing a holistic overview over what a CBM entails. Future research should therefore develop ex-ante assessment frameworks for CBMs that address all the required CBM elements listed in the checklist of this thesis. The checklist can also be used to test new frameworks, by assessing whether all BM elements are covered or not.

The findings of this thesis can be incorporated into the development of new toolkits and implementation guidelines for establishing CBMs. As part of this, research needs to investigate which prioritisation the different assessed aspects have for the practitioners and in what order the elements need to be assessed. It can reveal which aspects and themes practitioners in the focal sector concentrate on and where companies should invest their time and resources. While the checklist identified which elements an ex-ante assessment tool needs to cover, it did not look into the process of assessing. Future research thus needs to address the assessment process, the order for assessing the CBM elements and where to make decisions, so that it can easily be applied by practitioners.

However, it is essential that the existing ex-ante CBM assessment frameworks are disseminated among practitioners and their knowledge transferred from academia to the practical world. As the frameworks show legitimate performance according to the checklist applied in chapter 5 and provide valuable insights for practitioners, they can be viewed as useful tools for firms that are in the process of developing a CBM. Moreover, to make future frameworks more user-friendly they should be developed in close cooperation with practitioners and need to be adjusted to their needs and wants.

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Appendix

Appendix I – Interview Guide – Questions asked during interviews

Introduction to my project:

- Research topic:
 - Circular Business Models (CBM) = How businesses evaluate opportunities to make money from a circular business model/ circular product service interaction
 - E.g. renting, take-back or repair service schemes
 - My focus is the outdoor fashion industry (in Germany & Scandinavia): I see high potential for CBMs in outdoor fashion industry (durable material, high customer awareness)
 - In academic literature I identified a lack of CBM assessment tools that suit the sector
 - CBM assessment tools
 - Want to find out which tools are most suitable for/ meets the needs of this industry
 - I want to better understand reasoning, evaluations and assessment when choosing business model
- I will use information anonymously to synthesise the most important/ prioritised aspects practitioners mention and then aim to find out which of the existing assessment tools in literature suit best

Interview questions:

- **Different CBMs considered**
 - What were the drivers, motivation, reasons when going for circularity/ to establish a Circular Business Model (CBM)?
 - How does the CBM look like in detail?
 - Were there different CBM alternatives considered? (such as renting, recycling, repairing, re-commerce...)
 - What were the alternative CBMs considered?
 - To what degree is it planned to transition all operations to a CBM?
- **Tools used to assess/ forecast performance**
 - How was the current CBM chosen?
 - How did the process of choosing/ assessing/ forecasting this CBM look like?
 - What did you include in the assessment process?
 - Why did you include these things?
 - What were the main reasons why this CBM was chosen?
 - Was there any certain assessment methods used/ applied?
 - If yes, which one?
 - What insights did it deliver? What insights were lacking or uncertain?

- Did the company forecast its environmental impact/ profits/ etc?
 - (how) were economic benefits of a CBM assessed?
 - (how) were environmental/ circularity benefits of a CBM assessed?
 - (how) were social benefits of a CBM assessed?
 - (how) were shortcomings/ disadvantages of the CBM assessed?
- **Applied factors/ aspects**
 - Which aspects are most important in an assessment tool?
 - Examples:
 - Connection to sustainability dimensions (economic, environmental, social dimension)
 - Based on environmental impact data/ LCA/ emissions/ recyclability of material
 - High level strategies: closing, slowing or narrowing resource loops
 - Forecasting profitability, feasibility, environmental impacts
 - ...
 - Which factors are most important to consider when assessing?
 - What factors were prioritised?
 - What factors were quantified?
 - Which stakeholders/ interested parties were identified?
 - To what extent did the decision makers consult internal or external stakeholder?
 - What was important for stakeholders?
- **Expectations of an ex-ante assessment tool**
 - What insights are expected/ are searched for when applying an assessment tool?
 - What functions does a CBM need to fulfil?
 - What does an assessment tool need to provide to be applicable/ to be of great use to practitioners?
- Any other experiences from establishing a CBM you would like to share?
- Are there any other contacts, firms, people in this industry you think I should talk to/ could be a good interview partner for my project.

Can I contact you again if I have any follow up questions?

Appendix II – Guiding questions – Sent to interview participants prior to interview

Introduction to my project:

- Research topic:
 - Circular Business Models (CBM) = How businesses evaluate opportunities to make money from a circular business model/ circular product service interaction
 - E.g. renting, take-back or repair service schemes
 - CBM assessment tools
 - I want to find out which tools are most suitable for/ meets the needs of this industry
 - I want to better understand reasoning, evaluations and assessment when choosing business model
- I will use information anonymously to synthesise the most important/ prioritised aspects industry practitioners mention and then aim to find out which of the existing assessment tools in literature suit best

Interview questions:

- **Different Circular Business Models (CBMs) considered**
 - What were the drivers, motivation, reasons when going for circularity/ to establish a CBM?
 - Were there different CBM alternatives considered? (such as renting, recycling, repairing, re-commerce...)
- **Tools used to assess/ forecast performance**
 - How was the current CBM chosen?
 - How did the process of choosing/ assessing/ forecasting this CBM look like?
 - How did the company forecast its environmental impact/ profits/ etc?
- **Applied factors/ aspects**
 - Which aspects are most important in an assessment tool?
 - Which factors are most important to consider when assessing?
 - Which stakeholders/ interested parties were identified?
- **Expectations of an ex-ante assessment tool**
 - What insights are expected/ are searched for when applying an assessment tool?
 - What functions does a CBM need to fulfil?
 - What does an assessment tool need to provide to be applicable/ to be of great use to practitioners?
- Any other experiences from establishing a CBM you would like to share?