A Roadmap to Implementing Circular Economy in the Fast Fashion Industry

A Case Study of

Inditex & H&M Group

By

Nicole Cherine de la Sencerie El-Dessouky (128894) &

Rikke Mathiesen (127656)

Guidance counselor: Peter Neergaard

Characters incl. space: 244.469 characters / 107.5 pages

15th of May 2023

A master's thesis submitted for the degree of

Master of Science in Economics and Business Administration

Executive Summary

This thesis investigates how companies within the Fast Fashion Industry can redesign their Business Models to contribute to the Circular Economy. To examine this, a Conceptual Framework is deducted based on a review of theory within Eco-Effective Circular Economy. The academic contribution of the Conceptual Framework lies within its managerial purpose, as it attempts to provide an applicable and practical tool for implementing Circular Economy into existing Business Models. This leads to a visual roadmap that illustrates in what supply chain links Circular Economy can be implemented and through what initiatives. The framework adopts a system thinking perspective that is accentuated through colors, based on an assessment of 23 presented initiatives that are used as determinators for circularity.

The framework is tested by applying the framework to two case companies within the Fast Fashion industry: Inditex and H&M Group. In an assessment of whether the case companies' Business Models are equipped for implementation of Circular Economy initiatives, the findings are inconclusive regarding all areas of their supply chains, except for Materials Production & Finished Production Assembly. This leads to a discussion on how the Fast Fashion industry can equip their Business Models to implement the remaining Circular Economy initiatives, thus, obtain more circular Business Models.

Several Business Model Reconfigurations are suggested that could aid the implementation of Circular Economy. Meanwhile, it is uncovered that all courses of action are associated with multiple risks, as redesign of existing Business Models has many dependencies. The risks appear to be proportionally associated with the extent of the BMR. Meanwhile, the results suggest that their Business Models require radical Reconfigurations in order to qualify as equipped for Circular Economy implementation. Ultimately, this leads to a discussion of whether the Fast Fashion Business Models in their current form can be viable in the long term.

Table of Content

Executive Summary **1**
1. Introduction **4**
2. Research Question **5**
2.1. Sub-research Questions 6
3. Delimitation **7**
4. Methodology **8**
4.1. Research Philosophy 8
4.2. Research Approach 10
4.3. Methodological Choice 10
4.4. Research Strategies 11
4.5. Time Horizon 13
4.6. Research Techniques and Procedures 13
5. Literature Review of Circular Economy and Business Model **16**
5.1. Circular Economy (CE) 17
5.1.1. Zero Waste Hierarchy 21
5.1.2. Cradle to cradle 23
5.1.3. New Visual Conceptualization of Circularity (NVCC) 26
5.1.4. Database for Circular Economy Strategy Implementation 28
5.2. Business Model (BM) 29
5.2.1. Business Model Canvas 30
5.2.2. Value Chain 32
6. Conceptual Framework for Implementing Circular Economy in the Fast Fashion Industry **35**
6.1. Refuse, Rethink & Redesign 38
6.2. Raw Material Extraction & Processing 39
6.3. Material Production & Finished Production Assembly 40
6.4. Office, Retail, & Distribution Center 41
6.5. Consumer Use 41
6.6. Return 42
6.6.1. Reuse 44
6.6.2. Repair 44

6.6.3. Recycle 45
6.7. Visualization 46
6.8. Critique and Limitations 47
7. Circular Economy Implementation in the Fast Fashion Industry 49
7.1. Overview of the Fast Fashion Industry 50
7.1.2. Current Business Models 51
7.2. Raw Material Extraction & Processing 58
7.2.1. Raw Material Extraction & Processing in Inditex 59
7.2.2. Raw Material Extraction & Processing in H&M Group 62
7.3. Material Production & Finished Production Assembly 65
7.3.1. Material Production & Finished Production Assembly in Inditex 65
7.3.2. Material Production & Finished Production Assembly in H&M Group 69
7.4. Office, Retail & Distributions Centers 72
7.4.1. Office, Retail & Distributions Centers in Inditex 73
7.4.2. Office, Retail & Distribution Centers in H&M 75
7.5. Consumer Use 78
7.5.1. Consumer Use in Inditex 79
7.5.2. Consumer Use in H&M Group 83
7.6. Return 86
7.6.1. Return in Inditex 87
7.6.2. Return in H&M 92
7.7 Overall Assessment of Circular Economy Implementation 98
8. Refuse, Rethink & Redesign 99
8.1. Raw Material Extraction & Processing 100
8.2. Material Production & Finished Product Assembly 102
8.3. Office, Retail & Distribution Centers 104
8.4. Consumer Use 105
8.5. Return - Reuse, Repair & Recycle 107
9. Conclusion 110
10. References 113

1. Introduction

In 2021, the Intergovernmental Panel on Climate Change (IPCC), released a report stating, *"Human influence on the climate system is clear, evident from increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and physical understanding of the climate system"* (Eyring et al., 2021, p. 425). IPCC (2022) emphasizes that the human-induced climate crisis is affecting the ecosystem to the extent that human wellbeing is at risk, and consequently, urgent action is required to live up to the Paris Agreement and *"Limit the temperature increase to 1.5°C above pre-industrial levels"* (United Nations, 2015, p. 3). This has inevitably changed the corporate landscape that firms operate within, as they increasingly are being held accountable for the impact of their operations (Deloitte, n.d.). This accounts particularly for the most polluting industries which include Fuel Energy, Fashion, and Agriculture (Simon, 2021). Nonetheless, there remains a theory gap between the research performed on initiatives to minimize the impact of companies' operations, and the companies eventually implementing it. Consequently, companies still lack knowledge on how to implement sustainable processes in their Business Models (BM) (Appx. 5).

Therefore, the academic contribution of this thesis is to build a bridge between sustainable processes and BMs by offering a visual roadmap on how to implement Circular Economy (CE) into each supply chain link, as a means to achieve sustainability in existing BMs. Hence, the purpose of this thesis is not to disgrace companies for their operations of activity, but rather guide them to produce in a more sustainable way. The Fashion industry alone is estimated to be accountable for 10% of global carbon emissions and is therefore considered the second most polluting industry in the world (European Parliament, 2020). The Fashion Industry includes a myriad of sub-industries, whereas the Fast Fashion industry has found particular relevance with characteristics such as unresilient BMs built upon low prices and fast lead times that ultimately lead to increased consumption and throw-away culture (Hayes, 2022; Terrell, 2012).

One of the biggest problems with Fast Fashion is the amount of textile waste that is produced and ultimately ends up in landfills (European Parliament, 2022). Currently, there exist no scalable plan for handling the accumulated 7.5 million tons of textile waste in Europe, consequently "*By the end of 2024, Europe will face the challenge to compulsory separate the collection of textile waste"* (ReHubs, n.d.). For this reason, the roadmap built in this thesis offers a solution on how to handle the immediate problem, by focusing on CE as the way to achieve sustainability in the industry by eliminating waste and pollution (Ellen McArthur

Foundation, n.d.). Following, this thesis undertakes an Eco-Effectiveness approach to CE, that does not incentivize businesses to produce less, but rather ensures safe production that contributes to the environment rather than harming it (Braungart et al., 2007; Kalmykova et al., 2018).

To promote applicability, the roadmap created in this thesis will be industry-specific to the Fast Fashion Industry. To ensure the practical relevance and durability of the framework, it is tested on two case companies: Inditex and H&M Group, that excel in the required disciplines of the Fast Fashion Industry; therefore, the market leaders (based on net sales) (Hayes, 2022; Statista, 2023). The analysis is carried out on a business level, to explore how businesses can redesign the current BMs to contribute to CE with both long-term durability and profitability in focus (Osterwalder & Pigneur, 2010; Massa & Tucci, 2013). The thesis has an underlying purpose of trying to encourage and engage the industry to take part in the sustainable transition. According to Leonardo Rosado, Associate Professor at Chalmers University, "*One of the big issues here is that CE requires a system thinking of the entire life cycle and value chain, and it is not enough to only consider what you have right in front of you*" (Appx. 5). By providing them with an applicable tool that rely on a step-by-step approach and visualization tools, it is assumed that it is easier and more convenient for companies to detect where and how CE can be implemented and/or increased across their BMs and supply chains (Board of Innovation, n.d.; Sadowski et al., 2021; Appx. 6). Subsequently specific action alternatives will be provided for every step of the value chain based on Kalmykova et al. (2018) database for Circular Economy Strategy Implementation, providing an overview of the companies' implementation possibilities.

2. Research Question

The business economics problem area that defines the context of this thesis, lies within Strategic Management of Sustainable Business Development and International Operations (Pedersen & Bitsch Olsen, 2018). As of today, firms operate in the conventional Economic Growth Paradigm, in which growth is measured exclusively on economic metrics such as GDP (Harangozo et al., 2018). In the pursuit of unconstrained Economic Growth, companies are treating the environment as an economic externality, with no regard to how the current consumption patterns impact the planet and the environment (Fioramonti, 2017; Caradonna, 2017). This thesis seeks to contribute to a paradigm change towards a more environmentally

sustainable school of thought when assessing the success of companies and their BMs, by substituting GDP as the sole indicator of prosperity with environmental metrics. Consequently, this thesis leans towards the Sustainable Development Paradigm in that it entails fulfillment of the three pillars of sustainability, that all together creates the foundation for development: advancing social matters, preserving the environment, and building economic resilience (Hansmann et al., 2012). Thus, for development to be sustainable, it requires a holistic approach that incorporates systems thinking, and the way to achieve it is through governance (Purvis et al., 2019; Vilella, 2020; Appx. 5). To achieve Sustainable Development, this thesis takes a Circular Economy approach that seeks to eliminate waste and pollution through circulation of inputs and products (Ellen McArthur Foundation, n.d.). Considering the two case companies: Inditex and H&M Group, the research question will investigate:

RQ: How can companies within the Fast Fashion Industry redesign their Business Models to contribute to the Circular Economy?

The research question is defined according to Bitsch Olsen & Pedersen's (2018) definition of a good problem formulation. Thus, it consists of two links, and a relation. The thesis intends to investigate how the independent variable; *How can companies within the Fast Fashion Industry redesign their business models*, affects the dependent variable; *to contribute to the Circular Economy?*

2.1. Sub-research Questions

To concretize the research question and ensure that it is answered to the largest extent possible, four sub-research questions are defined. The intention is to divide the research into subsections, thereby making it more manageable to digest information and ultimately reach a conclusion (Pedersen, 2000). The sub-research questions, that this thesis seek to answer are defined as followed:

> *SQ1: What is Circular Economy and how can the concept be applied to the Fast Fashion Industry?*
>
> *SQ2: How is the Fast Fashion Industry characterized and what is the current level of Circularity in the industry?*

SQ3: What practices can be implemented to achieve a higher degree of Circular Economy in the Fast Fashion Industry?

SQ4: What complications might the Fast Fashion Industry encounter when implementing more circular practices in their business models?

3. Delimitation

This thesis considers Circular Economy (CE) implementation in the Fast Fashion industry; however, the context of the Fast Fashion industry is defined on the basis of the two case companies: Inditex and H&M Group who are chosen based on a consideration of the European based Fast Fashion industry (Statista, 2022). Thus, this thesis is delimited to focus on the Fast Fashion industry from a European perspective. Further, this thesis will not consider other CE practices performed by other Fast Fashion companies, whose BMs may be significantly different to those of the case companies. In efforts to achieve sustainable development a lot of different approaches can be utilized. In order to provide a clear and specific roadmap, this thesis will only consider an Eco-Effective CE approach to sustainability. Further, the thesis is conducted on a business level, and aims to maintain a business perspective on how the case company can manage their supply chain. Other factors such as carbon accounting, sustainability reporting, or stakeholder influence etc., could also be of relevance in this context. Nonetheless, due to time and page constraints these factors will not be accounted for in this thesis. Further, the thesis is limited to consider the following frameworks and concepts in the literature review: Zero Waste Hierarchy (Simon, 2019; Zero Waste, 2020), Cradle to Cradle (McDonough & Braungart, 2002), New Visual Conceptualization of Circularity (Board of Innovation, n.d.), and Database for Circular Economy Strategy Implementation (Kalmykova et al., 2018), Business Model Canvas (Osterwalder & Pigneur's, 2010), and a value chain specific for Apparel and Footwear (Sadowski et al., 2021). These concepts and frameworks have found great relevance in a review of Eco-Effective CE and BMs. However, it is acknowledged that other research and contributions might also have also found relevance in this context (Korhonen et al., 2018).

Lastly, this thesis makes use of emissions to interpret waste in the supply chain. In this regard it must be understood that "*Emissions affect a number of things in regards to the environment,*

most significantly, in terms of the greenhouse effect" (Krosofsky, 2021). Thus, emissions are considered waste as its disposure is considered a harmful result of production activities. Emission can either be measured according to the location- or market-based approach. The "*Location-based method reflects the average emissions intensity of grids on which energy consumption occurs*" (Sotos, 2015, p. 4). The market-based method, on the other hand, measures emissions based on specific contractual- or supplier specific rates (Sotos, 2015). Thus, the latter approach differentiates between emissions factors, of which electricity purchased via renewables would e.g., derive 0 kg CO2e/kWh, whereas emissions would always be measured as kWh times the local emissions factor in the previously mentioned approach, hence, not consider the possible sustainable origin of energy (Wade, 2023). Throughout this thesis, emissions will be accounted for according to the market-based approach as this allows for a distinction between more sustainable and circular sources of energy which is considered in alignment with the Eco-Effective approach to CE (Kalmykova et al., 2018).

4. Methodology

The following chapter will shed light on the approach to research underlying this thesis. The research design is composed of six layers, which include: (1) research philosophy, (2) research approach, (3) methodological choice, (4) research strategies, (5) time horizon, and (6) research techniques and procedures. It is critical to acknowledge and understand how the research is constructed as this has a direct effect on how data is processed and what conclusions are consequently drawn. For this reason, the following chapter will shed light on the six layers of the research design following Saunders et al. (2012) research 'onion'.

4.1. Research Philosophy

Research philosophy "*Can be thought of as your assumptions about the way in which you view the world*" (Saunders et al., 2012, p. 128). It is determined by ontology and epistemology. Ontology refers to the nature of reality in which the outer poles are objectivism vis-á-vis subjectivism. According to objectivism, concepts and entities exist independently of our attention to it, whereas subjectivism has the perception that "S*ocial phenomena are created through the perceptions and consequent action of affected social actors*" (Saunders et al., 2012, p. 133). Epistemology is concerned with what can be known, hence, considered knowledge. Epistemology differentiates between observable- and subjective phenomena. Observable phenomena consider knowledge as what can be seen, whereas subjective phenomena focus on

the meaning behind the socially constructed reality, hence, knowledge can never be objective. Within the area of Business and Management Research there are four general research philosophies with different ontology- and epistemology compositions. These are: Pragmatism, Positivism, Realism, and Interpretivism (Saunders et al., 2012).

When assessing- and choosing between different approaches to research i.e., research philosophies, it is easy to become biased and assume that one approach is better than another. However, here it is important to note that there is no superior research philosophy, "*They are just 'suited' to achieving different things*" (Saunders et al., 2012, p. 128). In fact, most often multiple research philosophies are applied simultaneously to perceive concepts from a more nuanced perspective. Following, it is acknowledged that this thesis also has ties to multiple research philosophies including at least: Realism and Pragmatism (Saunders et al., 2012).

This paper relies primarily on Realism as a research philosophy. Realism "*Is a branch of epistemology which is similar to positivism in that it assumes a scientific approach to the development of knowledge*" (Saunders et al., 2012, p. 136). Realism deals with an objective ontology that assumes that true and objective information exists. Meanwhile, this thesis deals more specifically with Critical Realism, as it is recognized that information can be deceiving, and that what can be observed is not always an accurate perception of what is. Most often the deception is a result of inadequate information, which finds particular relevance for the data used in this thesis, which mainly consist of reports published by the case companies. Here it is understood that the authors behind the reports have incentive to strengthen their own brand and appearance, which can lead to misconstrue through distortion of specific information (Saunders et al., 2012).

Further, Critical Realism regards observable phenomena as knowledge. However, according to the Critical Realistic view "*Phenomena create sensations which are open to misinterpretation*" (Saunders et al., 2012, p. 140). The axiology, logic of the research, according to this philosophy, is that the researcher and subsequent results will be biased by internal and external stimuli. Subsequently, it is acknowledged that this thesis is biased merely by our role in it. Factors that are assumed to influence our perception include our personal and educational background (Saunders et al., 2012).

Lastly, it is recognized that this thesis also relies to an extent on Pragmatism. This research philosophy is similar to Realism in terms of both ontology, epistemology, and axiology. However, pragmatism is "*A position that argues that the most important determinant of the research philosophy adopted is the research question, arguing that it is possible to work within both positivist and interpretivist position*" (Saunders et al., 2012, p. 678). For this reason, Pragmatism applies different approaches to interpreting data that combines a mix of philosophies. This applies to the research of this thesis, as conclusions in this paper relies on an interpretation of both secondary data, and primary data in the form of interviews and observations. Thus, information is drawn based on a pragmatic approach as it seeks to find relevant knowledge exploiting different research methods (Saunders et al., 2012).

4.2. Research Approach

The approach to research is determined by the use of theory. There are three generic modes of research which include a Deductive-, Inductive-, and Abductive approach. In summary the primary difference between the Deductive- and Inductive approach, is that deductive research begins with theory and a review of academic literature, whereas inductive research "*Starts by collecting data to explore a phenomenon*" (Saunders et al., 2012, p. 145). Abduction, on the other hand, begins with a surprising observation or fact, that consequently leads to the generation or modification of a theory (Saunders et al., 2012).

The Research Approach applied for this thesis is Deductive. This means that generalization moves from general to specific, which is recognized by the fact that a literature review and theoretical framework proceeds the data collection- and test. Further, "*Data collection is used to evaluate propositions or hypothesis related to an existing theory*" (Saunders et al., 2012, p. 144). In this relation it is clarified that the theory underlying this thesis, relating to Circular Economy (CE) and Business Models (BM), is used to generate a number of hypotheses through a framework which is subsequently tested (Saunders et al., 2012).

4.3. Methodological Choice

An important distinction regarding Methodological Choice is between the use of respectively quantitative and qualitative research, "'*Quantitative' is often used as a synonym for any data collection technique or data analysis procedure that generates or uses numerical data. In contrast, 'qualitative' is often used as a synonym for any data collection technique or data*

analysis procedure that generates non-numerical data" (Saunders et al., 2012, p. 161). There is often a clear coherence between Research Philosophy, Research Approach and Method. Quantitative research is e.g., most commonly associated with Deduction and Positivism as this philosophy deals with knowledge deducted from information rather than people and concepts. Nonetheless, no philosophies are restricted to the use of a mono method i.e., using only quantitative or qualitative data. However, this methodological approach can be assumed if it is found adequate to answer the research question (Saunders et al., 2012).

The use of multiple methods is very common when applying a Critical Realistic or Pragmatic Research Philosophy as these consider the duality between what can be observed and known, relative to what is understood and interpreted. The multimethod is applied to this thesis, as quantitative research is used to analyze publicly available data and develop relevant graphs, while a qualitative approach is exploited to supplement findings with e.g., interviews, where numerical data are inadequate, absent, or inconsistent. The use of multiple methods is differentiated between multimethod and mixed method. A multimethod design is applied when quantitative and qualitative research is carried out separately and used without overlap, whereas "*You might choose to collect quantitative data using, for example, both questionnaires and structured observation, analysing these data using statistical software (quantitative) procedures*" (Saunders et al., 2012, p. 165). The latter approach is known as a mixed method, as research methodologies are used fluently. A mixed methods approach is applied in this thesis as data from different sources are triangulated throughout the analysis to portray the most transparent and fair outlook possible, while knowing that data is still subject to bias (Saunders et al., 2012).

4.4. Research Strategies

The Research Strategy describes the "*Plan of action to achieve the goal*" (Saunders et al., 2012, p. 173). The Research Strategy determines the ability to answer the research question, for which reason, there should be a clear cohesiveness between the two. Saunders et al. (2012) distinguish between eight Research Strategies: (1) Experiment, (2) Survey, (3) Archival Research, (4) Case Study, (5) Ethnography, (6) Action Research, (7) Grounded Theory, and (8) Narrative Inquiry. Experiments and Surveys are typically associated with a quantitative methodology, Archival Research and Case Studies are often related to a mixed method, and Ethnography, Action

Research, Grounded Theory, and Narrative Inquiries are typically related to the use of qualitative methods (Saunder et al., 2012).

This thesis has undertaken a Case Study of two cases, i.e., a Multiple Case Study approach, to explain how companies within the Fast Fashion industry can redesign their Business Models (BM) to contribute to the CE. A case study "*Explores a research topic or phenomenon within its context, or within a number of real-life contexts*" (Saunders et al., 2012, p. 179). This is in line with the research of this thesis, which seeks to explore how CE can be implemented in the context of the Fast Fashion industry by applying real life cases. The benefit of using this Research Design includes the focus on specifically selected variables on which the goal is to uncover relationships. This approach stands in parallel to e.g., Experiments where the Research Design is rather exploratory and looks to uncover new relationships to raise- or question existing theories, rather than adding to existing ones (Saunders et al., 2012).

The choice of using Multiple Case Studies over a Single Case Study relates back to the research question. As the focus is to uncover how the Fast Fashion industry in general can reconfigure more circular BMs, it finds relevance to use multiple cases to ensure a greater Replicability of findings. Meanwhile, it is recognized that portraying only two Fast Fashion companies also has a high likelihood of compromising Reliability and Generalizability as it cannot be stated as a certainty (Saunders et al., 2012). However, it has not been possible to include more companies in the case study due to page- and time constraints.

While this thesis mainly relies on Case Study as Research Design it also draws similarities to Archival Research. Archival Research "*Makes use of administrative records and documents as the principal source of data*" (Saunders et al., 2012, p. 178). This approach to data also applies in this thesis, where various financial- and non-financial reports published by the case companies are used as the primary source of data to explain the implementation of CE. However, as with Archival Research most data rely on secondary sources which were meant for other purposes (Saunders et al., 2012). Consequently, the pitfalls related to this approach is that data is not always sufficient or in line with the research questions which can create gaps if further access is denied or refused. This finds relevance for the research of this thesis where results are sometimes found inconclusive due to a lack of disclosure and cooperativeness (Saunders et al., 2012). Consequently, it is assumed that cooperation with the case companies would have allowed for a more precise and thorough assessment of their CE implementation.

Further, it would have allowed for assessing the applicability of the framework from the companies' perspective (Appx. 1).

4.5. Time Horizon

The Time Horizon of research can depict either a snapshot of a specific point in time known as a Cross-Sectional Study, or research can uncover the development of a phenomenon over time, known as a Longitudinal Study. As this thesis seeks to uncover how Fast Fashion companies can change their current BMs to implement CE, the time horizon becomes restricted to a snapshot of the current situation. For this reason, this thesis, because of its focus on research, has adopted a Cross-Sectional Study in which data on the most current known context is used for research purposes. In some instances, a longer timeframe dating back to 2019 is used to add a context to specific development. However, this is used as a complement to explain the current outlook rather than to understand long-term development (Saunders et al., 2012).

4.6. Research Techniques and Procedures

Various Research Techniques and Procedures will have different effects on what is researched and measured. The choice of Research Design will inevitably have different consequences in terms of: Reliability, Validity, and Generalizability. Taking into consideration the effects of Research Techniques, Procedures, and their possible consequences can help ensure good quality. To obtain knowledge to uncover the area of research secondary data was supplemented by observations (Appx. 10; Appx. 11; Appx. 12; Appx. 13), and three Semi-Structured Interviews (Appx 4; Appx. 5; Appx. 6). Semi-Structured Interviews refers to when "*Researchers have a list of themes and possibly some key questions to be covered, although their use may vary from interviews, given a specific organizational context"* (Saunders, 2012, p. 374). The interviewees consisted of Madumita Sadagopan, Associate Researcher at University of Borås, and co-author of 'Circular economy - From review of theories and practices to development of implementation tools' (Kalmykova et al., 2018), along with co-author Leonardo Rosado, Associate Professor at Chalmers University. Additionally, Kevin Shahbazi, Principal Business Designer at Board of Innovation, and co-author of "New Visual Conceptualization of Circularity (NVCC) (Board of Innovation, n.d.) was interviewed (Appx 4; Appx. 5; Appx. 6). The interviews consisted of a set of questions under the following themes: (1) General Questions about the prospects of CE implementation, (2) Questions related to their

performed Research (Articles), and (3) Questions related to the prospects of CE implementation in the Fast Fashion Industry (Appx. 3).

The Reliability of research refers to "*Whether your data collection technique and analytical procedures would produce consistent findings if they were repeated on another occasion*" (Saunders et al., 2012, p. 192). In general Reliability can be threatened by factors such as: participant error, participant bias, researcher error, and researcher bias. Biases find particular relevance following the research of this thesis, which undertakes a Critical Realistic Research Philosophy, in which it is believed that observations, interviews, and findings are subject to interpretation, i.e., bias. On this basis, it is assumed that different researchers with different backgrounds and outlooks would deduce different results based on the same data sources, which consequently weakens the Reliability (Saunders et al., 2012). To limit specifically researcher- and participant bias, emphasis was put on asking open questions that did not lead to interviews to any particular answer. Nonetheless, the semi-structure sometimes requires further explanations or examples if the interviewees request further clarification. In this regard, Madumita Sadagopan e.g., requested clarification between 'driving factors' and 'circumstances' (Appx. 4). To limit researcher- and participant error, fixed roles were defined for all the interviews, by which one was defined as the interviewer and one as an observant. These roles were maintained throughout the interviews, to ensure attentive listening which increased Reliability as all interviewees were subject to the same setting (Saunders et al., 2012).

During the interview most of the questions remained similar and standardized and were asked using the same tone and worded exactly as written to further restrain errors and enhance Reliability. Meanwhile, questions related to (2) Questions related to their performed Research (Articles) were distinguished. The structure of the interviews, i.e., the semi-structured order, allowed us to dive deeper into aspects relevant to our discussion and consequently helped increase Applicability of the roadmap, which ultimately allowed us for deeper exploration of our research question (Saunders et al., 2012). Nonetheless, with only three interviews the primary data performed remain rather limited, which ultimately weakens the Construct Validity of this thesis.

The Validity of research is considered in terms of respectively: Construct Validity and Internal Validity. Construct Validity "*Is concerned with the extent to which your research measures actually measure what you intend them to assess*" (Saunders et al., 2012, p. 193). As this thesis

relies on a Multiple Case Study within the Fast Fashion industry, the measures assumed to analyze this context are upheld. However, as the research strategy draws to a large extent on Archival Research, it is acknowledged that the research measures were not made for the purpose of this research, for which reason some measures are insufficient or not available. Consequently, this decreases the Construct Validity of the research. Several attempts have been made to increase construct validity, by gaining access to further information via direct contact to the two case companies. However, all inquiries have been denied or overlooked (Appx. 1).

The Internal Validity considers whether there is basis to assume a causal relationship between two variables such as an initiative and its ability to foster CE. In this thesis causality is primarily based on the use of Deduction. This means that causality is based on existing theory which has proven a relationship between various approaches to waste management and specific initiatives that has been assumed to foster CE. It is assumed that this approach has helped raise Internal Validity, as the variables that are being researched have withstood a long series of prior research and falsification testing (Saunders et al., 2012).

The last factor to ensure the quality of research techniques is Generalizability, also known as External Validity. Generalizability considers the question: "*Can a study's research findings be generalised to other relevant settings or groups?*" (Saunders et al., 2012, p. 194). The Generalizability of this research is concerned with a specific industry. In this context the two biggest organizations in Europe based on net sales: Inditex and H&M Group, have been chosen as these makes hold a big market share and are assumed leaders (Hayes, 2022; Statista, 2023). Choosing market leaders is assumed to raise Generalizability, as their BMs are considered representative not necessarily to the entire industry, but at least aspirational to portray what BM components are important factors to achieve a successful BM within the industry. At the same time, it is recognized that the research is restricted to consider one industry. For this reason, the conceptual framework deduced from relevant theory on the area, would need to undergo further tests in other industries to gain a greater level of Generalizability (Saunders et al., 2012).

In terms of the primary data gathered through interviews, the variety between the interviewees allowed for both theoretical perspectives from Madumita Sadagopan and Leonardo Rosado, and business innovation perspectives from Kevin Shahbazi (Appx 4; Appx. 5; Appx. 6). This enabled building bridges between research performed on initiatives to minimize the impact of

companies' operations, and the companies eventually implementing it. As the roadmap seeks for the highest possible applicability, different perspectives are assumed to increase Generalizability.

5. Literature Review of Circular Economy and Business Model

Ever since the first World Climate Conference in 1979, where scientists concluded that greenhouse gas, stemming from the increasing buildup of carbon dioxide in the atmosphere, requires urgent action (World Meteorological Organization, 1979), research on sustainability and Circular Economy (CE) have been subject to an exponential increase. Nonetheless, the subjects remain open concepts with a myriad of definitions (Dimensions, 2023; Purvis et al., 2019). In essence, Sustainability is defined as *"The ability to continue or be continued for a long time"* (Oxford Advanced Learner's Dictionary, n.d.). However, in the context of this thesis, which aims to capture the aspect of environmental sustainability, the definition that applies more accurately is Sustainability as *"The use of natural products and energy in a way that does not harm the environment"* (Oxford Advanced Learner's Dictionary, n.d.). In the past few decades, an increasing number of companies and researchers have looked into the possibility of developing industries in a more sustainable sense, i.e., *"To ensure that it [sustainable development] meets the needs of the present without compromising the ability of future generations to meet their own"* (United Nations, 1987, p. 41).

Researchers have explored several alternative paradigms to substitute the conventional Economic Growth Paradigm, where success and growth are measured exclusively on economic metrics such as GDP growth, with a more sustainable school of thought (Harangozo et al., 2018; McDonough & Braungart, 2002). The School of Sustainable Development is assessed as the most viable solution, compared to other schools of thought, e.g., the Degrowth Paradigm that aims at slowing down the social metabolism, reducing global consumption and production, and replacing GDP as the indicator of prosperity with social and environmental metrics. Degrowth and similar concepts remain an interesting subject for analysis but have only been proven viable on a theoretical level (Muraca & Schmelzer, 2017). What sets the Sustainable Development Paradigm apart is that it entails fulfillment of the three pillars of sustainability, that all together creates the foundation for development, suggesting that if something is an environmental problem, it will inevitably become an economic problem (Hansmann et al., 2012). Thus, for development to be sustainable, it requires a holistic approach that incorporates

systems thinking, and the way to achieve it is through governance (Purvis et al., 2019; Vilella, 2020).

One commonly acknowledged course of action toward achieving environmental sustainability is through CE, which builds upon the recognition that the planet has a restricted capacity to digest pollution (McDonough & Braungart, 2002). CE is a result of an attempt to detangle several sustainability concepts, thus, some CE strategies often derive or are borrowed from sustainability, resulting in a close linkage between the two concepts (Kalmykova et al., 2018). However, "*While the need to transition towards a circular economy from an economic, environmental and public health point of view is hardly disputed, the concept has often been driven and dominated by a business agenda which raises the need to define clearly what do we mean by a Zero Waste Circular Economy*" (Vilella, 2020, p. 3). The topic is high on the political agenda and several initiatives including directives and legislative proposals for waste management, extended producer responsibility, and eco-design have already been introduced to the business arena (Korhonen et al., 2018; European Union, 2018).

5.1. Circular Economy (CE)

CE serves as a sustainable economic system that puts emphasis on economic growth through the reduction and recirculating of resources (Corona et al., 2019). Despite the increasing amount of research on the topic, CE remains to some extent rather unexplored. Consequently, there is not yet a commonly accepted definition of Circular Economy (Korhonen et al., 2018). According to the Ellen MacArthur Foundation (n.d.), a highly acknowledged international NGO committed to implementing circularity, Circular Economy is defined as:

> "*An industrial economy in which material flows keep circulating at a high rate without entering the biosphere unless they are biological nutrients [...]; [...] that is restorative by intention; aims to rely on renewable energy; minimizes, tracks and eliminates the use of toxic chemicals; and eradicates waste through careful design [...]; [...] provides multiple value-creation mechanisms which are decoupled from the consumption of finite resources"* (Kalmykova et al., 2018, p. 194).

According to this definition, a prerequisite for CE is that the material flows that derive from a company's production must be in a form that nature can digest (Korhonen et al., 2018), This

indicates that "*The basis of a circular economy is a zero waste society, where everything that we produce and consume can return safely to nature or society*" (Vilella, 2020, p. 7). According to the Board of Innovation (n.d.) CE Business Models (BM) entails: (1) Sourcing products and materials from the economy, and not from ecological reserves, (2) Creating value for customers by adding value to existing products and materials, and (3) Creating valuable inputs for businesses beyond your customers.

In essence, CE investigates waste prevention and resource reuse as a means to achieve sustainable economic growth that is aligned with the three pillars of sustainability (Hansmann et al., 2012; Korhonen et al., 2018). One of the challenges in achieving sustainable development lies in the problematic physical flow of material and energy (Braungart et al., 2007). Consequently, CE is the transition away from a linear economy, i.e., where products are produced on the basis of 'take-make-dispose', with limited concern for the ecological footprint - towards a cyclical and closed-loop economy (Crocker et al., 2018; Korhonen et al., 2018). Thus, *"The circular economy requires fundamental change to the traditional economic model of mass production, increasing consumption and ever larger amounts of waste"* (Crocker et al., 2018, p. 13).

CE requires a system thinking as it is expected to benefit all three pillars of sustainable development for instance in terms of:

Positive influence of CE on the three pillars		
Environmental benefits	**Economic benefits**	**Social benefits**
→ Reduced input → Reduced waste and emissions → Optimization of resources input	→ Reduced raw material and energy costs → Use of scarce resources is minimized → Reduced costs from environmental legislation, taxes etc. → Reduced waste management costs → New potential markets	→ New employment opportunities → Increased sense of corporations through sharing economy → Increased health due to a decrease of waste e.g., airborne toxins

Table 1 (Own contribution on the basis of Korhonen et al., 2018; McDonough & Braungart, 2002)

In reviewing the topic of CE, Kalmykova et al. (2018) discover the distinction between two approaches to implementing CE: Eco-Efficiency and Eco-Effectiveness. The focus on Eco-Efficiency follows an approach of reducing waste by *"Minimizing the volume, velocity, and toxicity of the material flow system"* (Kalmykova et al., 2018 p. 195). In terms of reduction, this area of sustainability is mostly concerned with the output of waste, with less consideration to the input (Kalmykova et al., 2018). In this regard, it is possible to achieve Eco-Efficiency in a linear economy, meaning that this approach to CE will ultimately not prevent the challenges of environmental depletion coming from production of non-recyclable waste, but inevitably only slow it down (Herrmann et al., 2015).

Eco-Effectiveness, on the other hand, is defined as: "*The transformation of products and their associated materials flows such that they form a supportive relationship with ecological systems and future economic growth. The goal is not to minimize the cradle-to-grave flow of materials, but to generate cyclical, cradle-to-cradle 'metabolism' that enable materials to maintain their status as resources"* (Kalmykova et al., 2018 p. 194). Eco-Effectiveness does not promote boycott of products, minimizing one's use, or prolonging the life cycle of products. Instead, it paves the way for how products and ecosystems can be created in mutually beneficial relationships (Braungart et al., 2007). According to this concept, CE starts with the redesign of production, as "*A product which becomes waste just has a quality problem*" (Braungart, 2020). The impact of the two approaches is illustrated below:

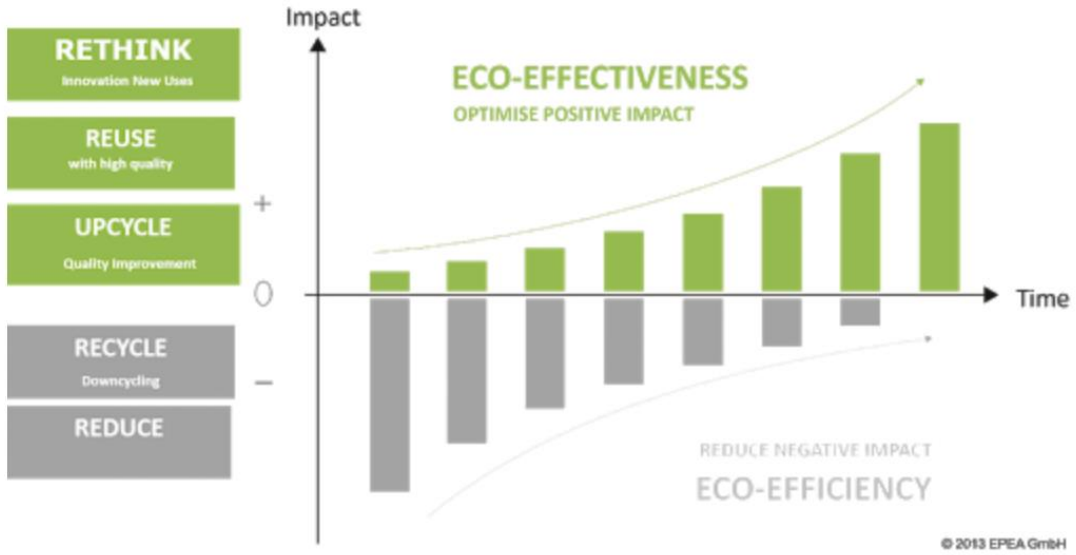

Figure 1 (EPEA, n.d.).

For CE to be truly effective, pollution from the material flows must be reduced not only in terms of output (waste and emissions) but also in terms of input (energy and material) (Korhonen et al., 2018). This thesis seeks to implement the highest level of CE, and as Eco-Efficiency does not prerequisite complete circulation of waste and can also be achieved in a linear economy it is not considered aligned with the ambition of this thesis (Kalmykova et al., 2018). Focus will therefore rather be on waste reduction in accordance with Eco-Effectiveness. Eco-Effectiveness is seen in multiple concepts with Cradle-to-Cradle being the most researched and acknowledged one (Kalmykova et al., 2018; Braungart et al., 2007).

5.1.2. Critique and Limitations

To this day, the scientific research performed on CE is rather unexplored, and appears superficial and unorganized (Korhonen et al., 2018). In reviewing this subject, Kirchherr et al. (2017) discovered over 100 divergent definitions of Circular Economy (Alvarez-Risco et al., 2022). Furthermore, Kalmykova et al. (2018) suggest eight different definitions of the term Circular Economy, that all offer alternating conceptualizations, e.g. An aspect that is not explored in this thesis is CE as a concept that *"Focuses on stock optimization"* or is *"An industrial model that decouples revenues from material input"* (Kalmykova et al., 2018, p. 194). Further, Kalmykova et al. (2018) suggest that similar concepts with different terminology might also apply to the concept of CE, e.g., Closed-Loop Economy, Zero Waste Economy, Green Supply Chain Management, etc. Thus, an attempt to apply theory to companies implementing CE might be compromised by the fact that it is not possible to assume that the given theory has a similar approach to CE, which might lead to ambiguous results (Kalmykova et al., 2018).

Korhonen et al. (2018) highlight six limitations that suggest that CE is not always the optimal solution for achieving environmental sustainability, and that must be resolved:

1. Thermodynamic limits i.e., materials cannot be circulated indefinitely, as energy continuously will become less usable.
2. Spatial and temporal system boundary limitations, i.e., currently there is no global body to govern the CE implementation nor assess the global net sustainability and its full impact.
3. Limits posed by physical economic growth, i.e., the dominating consumption culture currently compromises CE implementation.

4. Path dependencies i.e., the current business logic may prevent the majority of the suggested CE innovations.
5. Differences in Intra-organizational vs. Inter-organizational strategies and management might interfere with each other, and currently, the right course of action is not currently mandated by law.
6. The definition of physical flows is temporal and cultural; thus, all proposals should be viewed in a specific context (Korhonen et al., 2018)

5.1.1. Zero Waste Hierarchy

As described earlier "*The basis of a circular economy is a zero waste society*" (Vilella, 2020, p. 7). For this reason, an account of the concept Zero Waste finds particular relevance. The concept of Zero Waste has existed for almost as long as the school of CE (Pires & Martinho, 2019). The principles of Zero Waste have contributed to the implementation of circular practices in Europe, by "*Replacing the linear economy based on take-make-throw away that assumes our planet has infinite resources*" (Vilella, 2020, p. 12). The concept has been visualized in several frameworks such as the Waste Hierarchy and later the Zero Waste Hierarchy. The latter assumes a broader definition of what qualifies as non-waste, which includes not only minimization of waste, but also integrates a level for refusing waste through redesign (Simon 2019; European Commission, 2023). This framework is therefore considered to reside within Eco-Effectiveness as it takes a systems approach to waste management (Kalmykova et al., 2018; Braungart et al., 2007). Therefore, this framework offers a useful guide on how industries, such as Fast Fashion, can prioritize circularity in their BMs in accordance with the Paris Agreement and the Sustainable Development Goals (Vilella, 2020).

The Zero Waste Hierarchy divides waste into three categories: non-waste, waste with full recovery, and waste without (full) recovery, whereas only the two first categories comply with the definition of Eco-Effective CE (Simon, 2019; Kalmykova et al., 2018). The first two levels within non-waste is: (1) Refuse, Rethink & Redesign and (2) Reduce & Reuse. The first level can be achieved by "*Stopping waste from being produced. Be it by creating a system that is waste free by design or by stopping the commercialisation of single-use items that can be easily replaced with alternatives*" (Simon, 2019). The second level, Reduce & Reuse, refers to minimizing the volume in production and the active engagement in the market to prevent waste from being disposed of by finding new value for them in their current form, hence, without processing (Simon, 2019). The third and fourth levels of the Zero Waste Hierarchy qualify as

waste with full recovery. These include (3) Preparing for Reuse, and (4) Recycling, Composting & Anaerobic Digestion (Simon, 2019). Preparing for Reuse includes "*Checking, cleaning, repairing, refurbishing, whole items or spare parts*" (DEFRA, 2011, p. 3), while Recycling, Composting & Anaerobic Digestion refers to the process of turning an old product into high quality secondary raw materials (Simon, 2019).

The less desirable waste management; waste without (full) recovery, rank from: (5) Material Recovery, (6) Residual Management, and (7) Unacceptable Disposal (Zero Waste, 2020). These levels do not comply with CE as resources are not kept in a closed loop (Simon, 2019). Material Recovery "*Prioritises the extraction of valuable materials from the mixed waste and the discards from sorting processes*" (Simon, 2019), thus, recovers only part of the waste. Thereafter, Residuals Management, refers to the management and separation of non-recyclable waste, "*Allowing for most of the biologically active waste to be diverted from the residual waste*" (Simon, 2019). This process enforces that the waste can at least be safely disposed of, which stands in opposition to the last level: Unacceptable Disposal, which refers to waste without any form of resource management i.e., mixed waste. Ultimately, these waste management approaches should be avoided according to zero waste practices (Simon, 2019). The Zero Waste Hierarchy is illustrated below in Figure 2:

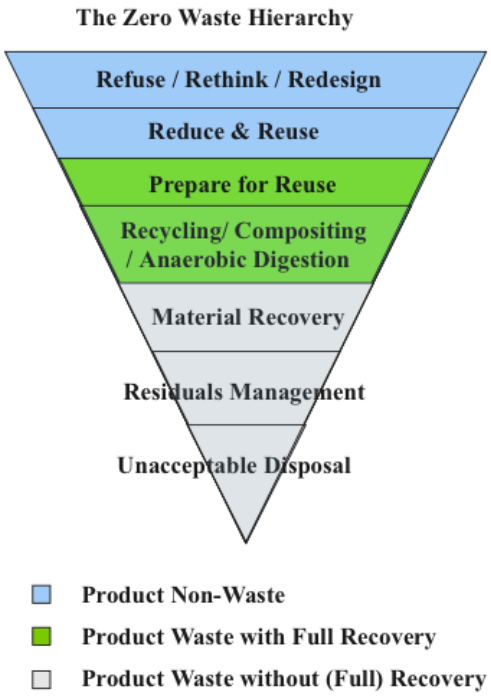

Figure 2 (Own contribution on the basis of European Commission, 2023; Simon, 2019)

5.1.1.1. Critique and Limitations

In 2008 the waste management was embedded into the legislative arena when The European Union introduced the EU Waste Directive as part of the "*Broader EU circular economy initiative, which aims to move the European economy toward sustainable production and consumption*" (Assent, n.d.). The Directive mandates European member states to live up to waste reduction goals in the form of preparing for reuse and -recycling corresponding to levels two and three of the Waste Hierarchy (European Union, 2018). Meanwhile, the Directive does not mandate specific national law or regulation. It rather requires member states to implement the principles of waste management on an individual level to live up to the general goals (European Union, 2018). Which according to Madumita Sadagopan and Leonardo Rosado is one of the main drivers holding back CE implementation, as regulations play an important role (Appx. 4; Appx 5). Further, this creates a challenge as the definition of both circularity and waste management remains open for interpretation (Alvarez-Risco et al., 2022).

Just as in the general field of sustainability and circularity, it is noticeable that Zero Waste has been subject to multiple interpretations and definitions. This means that "*Many variations of this waste management hierarchy exist*" (Zero Waste, 2020), in which circularity and non-waste finds altering definitions, consequently, the Waste Hierarchy and Zero Waste Hierarchy are just examples. Lastly, it must be noted that the waste hierarchies are a reflection of the current state of development within the area of Sustainability (European Commission, 2023; Simon, 2019). As previously stated, the area has experienced tremendous growth in attention since its introduction and it is assumed that the plethora of existing research will continue to grow in the forthcoming years. Therefore, more interpretations and variations will likely appear (Korhonen et al., 2018).

5.1.2. Cradle to cradle

Cradle to Cradle (C2C) represents one of the most researched and acknowledged concepts of Eco-Effectiveness (Kalmykova et al., 2018), as it builds on the underlying logic of infinite circulation of products and resources that are safe and recyclable and therefore does not create waste (Braungart et al., 2007). The principles of C2C are united with CE, as both concepts consider products from a Life Cycle Approach, in which all stages of a product's life are considered in decision-making (McDonough & Braungart, 2002, p. 102). For this reason, the concept is relevant to consider. The C2C concept was originally developed by Michael Braungart, William McDonough and EPEA in the 1990s (EPEA, n.d.). EPEA was founded by

Michael Braungart in Hamburg in 1987 and is an organization that "*Accompanies companies in the certification of their products according to the Cradle Certified product standard*" (EPEA, n.d.). C2C stands in opposition to the Cradle to Grave approach, that corresponds to Linear Economy and produces on the basis of 'take-make-dispose' (Korhonen et al., 2018).

The C2C design framework distinguishes between two types of cycles: The biological cycle and the technical cycle (McDonough & Braungart, 2002). The biological cycle is concerned with natural products (C&A, 2022). The cycle requires production to be biodegradable, consequently, *"In biological (organic, biodegradable) products after-use materials can 'decompose and become food for plants and animals and nutrients for soils'. Eco-textiles, for example, can be used as compost after their useful life*" (Kopnina, 2018, p. 120). Biological products do not need to be actively put back into production, as this process occurs seamlessly when natural resources are extracted (C&A, 2022). Production of biological cycle products corresponds to the first level of the Zero Waste Hierarchy: Refuse, Rethink & Redesign, as waste is completely prevented through the redesign of products (Simon, 2019; Kopnina, 2018). Thus, the biologically cycle of products according to the C2C framework flows from:

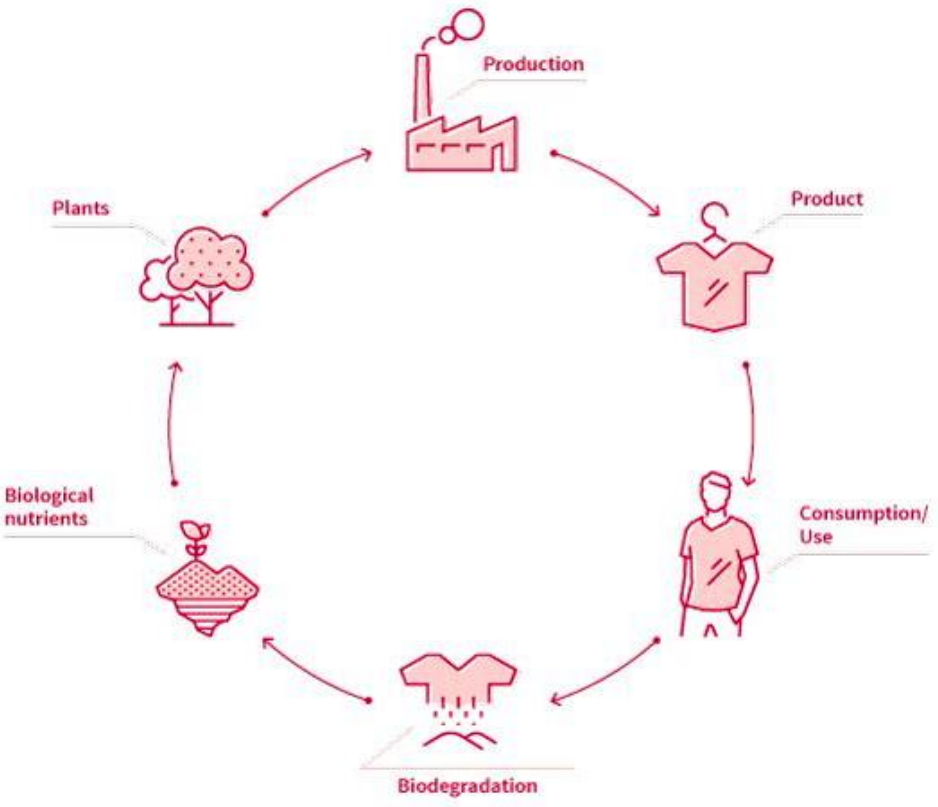

Figure 3 (C&A, 2022)

The second cycle in the C2C framework is the technical cycle (McDonough & Braungart, 2002, p. 104). This cycle deals with consumer products that cannot be produced of natural resources, hence, does not have the potential to become biodegradable and compostable (C&A, 2022). Thus, the technical cycles represent an alternative to the biological cycle, as it depicts how products where waste cannot be prevented. Similar to the process seen in the biological cycle, a prerequisite for the circulation of safe products is that they are designed so that the technical nutrients can be disassembled and recycled, thus enabling full recovery of the waste (McDonough & Braungart, 2002; Simon, 2019). However, a prerequisite for this process to occur in the technical cycle is that products are returned (C&A, 2022). This means that products in the technical cycle of C2C need to be actively managed to secure a circular lifecycle in contrast to biological products (EPEA, n.d.). Nonetheless, design is still pivotal for this type of C2C because using materials that are not damaging remains a prerequisite for the circularity of products (C&A, 2022). The technical cycle is illustrated below:

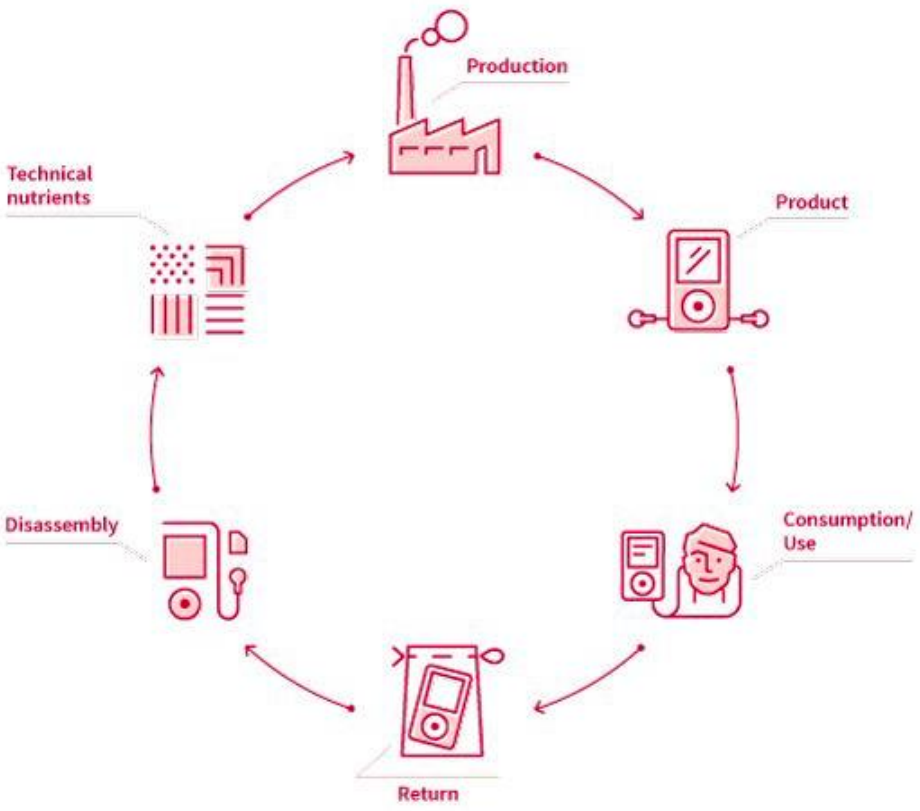

Figure 4 (C&A, 2022)

5.1.2.1. Critique and Limitations

The researchers behind C2C stand critical of the original definition of sustainability as provided in the Brundtland report of 1986 (Braungart, 2020). According to their point of view, the United Nations goal to meet "*The needs of the present generation without compromising the needs of future generations*" (United Nations, 1987, p. 41) is unambitious (Braungart, 2020). Meanwhile, there are only around 11,000 C2C-certified products on the market currently (Braungart, 2020). This reflects that producing C2C products is difficult and may be a hindrance of being adopted in the market. If creating C2C products is too resourceful it may be overlooked by businesses prioritizing actions with a bigger immediate yield. This balance between CE and conventional Economic Growth paradigm is important to keep in mind, as most businesses are not born into the world to do good but to profit from their activities (Harangozo et al., 2018). Therefore, the initiatives proposed in the C2C framework should be critically tested in real life cases to see if they reflect product innovations. Additionally, C2C is bounded by some of the same constraints as CE, presented in section 5.1.: thermodynamic limits, spatial and temporal system boundary, limits posed by physical economic growth, path dependencies, differences in intra-organizational vs. inter-organizational strategies and requirement to view everything in a specific context (Korhonen et al., 2018).

5.1.3. New Visual Conceptualization of Circularity (NVCC)

Board of Innovation (n.d.), a global innovation firm, has conceptualized a framework that visually enables comparison and evaluation of companies' circular impact. Their framework serves as a visual rating system, which enables companies to identify improvement opportunities for CE in the value chain, which finds particular relevance for the research of this thesis. The NVCC framework consists of 5 icons that each represent some part of the value chain: (1) Make, (2) Return & Recycle, (3) Use, (4) Reuse & Repair, and (5) Waste. To visually compare companies, the framework utilizes color coding to indicate whether the circular impact in a given area of the company's value chain is positive (green), neutral (grey), or negative (red) (Board of Innovation, n.d.). According to Kevin Shahbazi, one of the authors behind the framework, "*We created this framework, and we made it visual to make it practical for businesses to use, and to make it possible for stakeholders to have discussions that are needed*" (Appx. 6). A company's value chain could for instance be visualized as followed (Board of Innovation, n.d.):

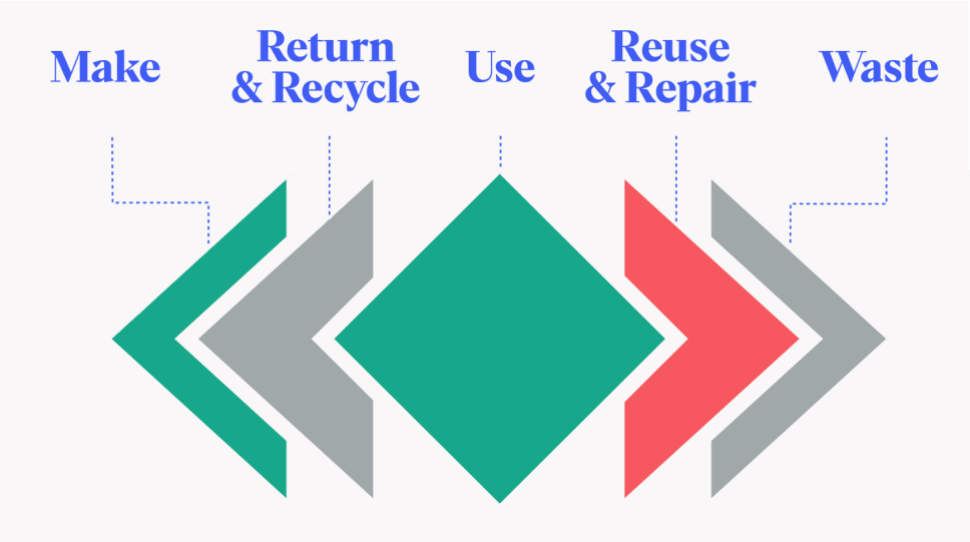

Figure 5 (Board of Innovation, n.d.)

The framework contains following aspects of the value chain: (1) Make; implementing processes that support sourcing preferred and/or recycled materials while reducing resource consumption, (2) Return & Recycle; implementing processes that enable take-back systems and subsequent processing of these by e.g., recycling, (3) Use; implementing processes that enhance durability and prolong the use-phase to the longest extent possible, (4) Reuse & Repair; implementing processes that support various options for repair and reuse, and (5) Waste; implementing processes that minimize waste and the possibility of the materials ending up in landfills (Board of Innovation, n.d.). The NVCC framework builds a bridge between CE and the value chain. For this reason, NVCC is a beneficial tool for companies looking to implement circularity into different parts of their value chain as it allows for a distinction (Board of Innovation, n.d.).

5.1.3.2. Critique and Limitations

Kalmykova et al. (2018) argues that research performed on some areas of the value chain is rather limited, thus, areas such as manufacturing, distribution and sales are rarely involved in CE. This also applies, at least to some extent, to this framework, that does not account for e.g., distribution and sales (Board of Innovation, n.d.). Further, the framework fails to clarify which areas or solutions are the most sustainable in a CE perspective. According to the illustration it appears as if Return & Recycle and Reuse & Repair are equally environmentally sustainable solutions, which, according to the Zero Waste Hierarchy, is not correct (Simon, 2019). Lastly, the framework does not provide applicable solutions to each step, which might complicate the

implementation process for organizations when trying to adopt the framework. Furthermore, Board of Innovation (n.d.) does not account for how the companies are assessed, which compromises the ability to replicate it to other or similar settings (Saunders et al., 2012).

5.1.4. Database for Circular Economy Strategy Implementation

In a literature review of CE, Kalmykova et al. (2018) have gathered a database that summarizes 45 methods for implementing CE; "*The developed databases can serve as tools for implementation of the suggested in the literature theoretical approaches. In particular, CE Strategies Database and CE Implementation Database include strategies and implementation examples, respectively, for each part of the value chain*" (Kalmykova et al., 2018, p. 195). The review is based on a deductive approach with the aim to gather an overview of the overcrowded area (Kirchherr et al., 2017). Furthermore, the paper seeks to operationalize findings on CE into "*Strategies that are applicable to different parts of the value chain*" (Kalmykova et al., 2018, p. 190). For this reason, the database finds relevance as a tool to operationalize CE into real-life BMs.

The database for Circular Economy Strategy Implementation targets both actors on a system scale (NGOs, policy makers etc.) and actors (partly or fully) managing value chains. The value chain consists of nine resource flows: (1) Materials Sourcing, (2) Design, (3) Manufacturing, (4) Distribution, (5) Consumption and Use, (6) Collection and disposal, (7) Recycling and recovering, (8) Remanufacturing, and (9) Circular inputs (Kalmykova et al., 2018). In the process of applying the 45 strategies into the value chain Kalmykova et al. (2018) found that the majority of CE initiatives described in literature refers to downstream parts of the value chain such as: Consumption & Use, Collection & Disposal, and Recycling & Recovering.

Kalmykova et al. (2018) deduct from their findings that "*There are several possibilities for materials to circulate in tight loops*" (p. 191). The possibilities include carrying out Life Cycle Assessments in the Materials Sourcing phase, Customization in the Design Phase, Material Productivity in the Manufacturing Phase, Redistribute & Resell during Distribution & Sales, Eco-Labeling during Consumption & Use, and Take-Back and Trade-In Systems under Collection & Disposal. The remaining initiatives that are found relevant in the context of the Fast Fashion industry will be introduced throughout section 6. To operationalize the research of this paper.

5.1.4.2. Critique and Limitations

Kalmykova et al. (2018) found that existing literature on CE is limited in the sense that downstream areas of the value chain are far more explored as opposed to other parts of the value chain. Thus, measures for implementation have a skewed distribution that can hinder cohesive implementation of CE throughout a value chain. In regard to the research performed by Kalmykova et al. (2018), their method is limited to only using 'Circular Economy' as a keyword when searching for contributions of academic relevance. Combined with the fact that the collection of data and research on the area of CE appears to be vague and disseminated, this can have caused a search bias in which important contributions on CE have been overlooked if the exact keyword was missing in this context (Korhonen et al., 2018). Moreover, the "*The literature search has been performed during spring 2015 in Scopus database, Google and Google Scholar*" (Kalmykova et al., 2018, p. 191). As described previously, the area of CE economy has seen tremendous growth which is reflected in a vast increase in publications under the topic. While knowing this, it must be acknowledged that a literary review from 2015 may be outdated because new information and research has been explored since (Dimensions, 2023; Purvis et al, 2019).

5.2. Business Model (BM)

A Business Model serves as "*A representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network*" (Shafer et al. 2005, p. 204). Within the last 20 years, the Business Model has become an increasingly popular unit of analysis. This spike in attention has been caused by the realization that the Business Model is a dynamic concept, consequently, following a traditional static Business Model will not suffice in a world where information and communication flows freely and fast (Massa & Tucci, 2013). In their study of Business Models, Massa & Tucci (2013) recognize two types of Business Model changes: Business Model Design (BMD), which refers to the creation of a novel Business Model for new businesses, and Business Model Reconfiguration (BMR), which refers to the change of one or more Business Model components within an existing company (Massa & Tucci, 2013). As this thesis aims to provide a roadmap for how already established Fast Fashion companies can redesign their Business Models to become more circular, the latter definition finds relevance. However, redesigning Business Models is not without risk (Massi & Tucci, 2013). The following sections will attempt to offer clarifications of the terms Business

Model and Value Chain, and subsequently describe what concerns and risks may be associated with engaging in BMR.

5.2.1. Business Model Canvas

One of the most commonly used and acknowledged frameworks within the area of the business models (BM) is Osterwalder & Pigneur's (2010) Business Model Canvas (Lima & Baudier, 2017). The canvas offers a definition in which the Business Model is composed of nine building blocks. According to Osterwalder & Pigneur's (2010) definition "*The nine blocks cover the four main areas of a business: customers, offer, infrastructure, and financial viability*" (Osterwalder & Pigneur, 2010, p. 15). The specific nine blocks are: Key Partners, Key Activities, Key Resources, Value Propositions, Customer Relationships, Channels, Customer Segments, Cost Structure, and Revenue Streams (Osterwalder & Pigneur, 2010).

<table>
<tr><th colspan="5">Business Model Canvas</th></tr>
<tr><th>Key Partners</th><th>Key Activities</th><th>Value Proposition</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr><td rowspan="3"></td><td></td><td rowspan="3"></td><td></td><td rowspan="3"></td></tr>
<tr><td>Key Resources</td><td>Channels</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Cost Structure</td><td colspan="3">Revenue Streams</td></tr>
<tr><td colspan="2"></td><td colspan="3"></td></tr>
</table>

Table 2 (Own contribution on the basis of Osterwalder & Pigneur, 2010)

A business's Key Activities "*Describes the most important things a company must do to make its business model work*" (Osterwalder & Pigneur, 2010, p. 36), e.g., problem solving in consulting companies. A company's Value Proposition describes "*The reason why customers turn to one company over another. It solves a customer problem or satisfies a customer needs*" (Osterwalder & Pigneur, 2010, p. 22). Key Resources constitute the most important assets that make a business run, e.g., for production companies the physical facilities may be a primary resource to run a business, while human resources might be of greater importance in the consulting industry.

Customer Segments "*Represents the different groups that the business aim to serve*" (Osterwalder & Pigneur, 2010, p. 20). Some businesses engage in niche markets where the customer segments are smaller and competition less intense, while others aim for a mass market of which the competition is typically more intense. Meanwhile, Customer Relationships clarify the interaction between the business and its customers. Whereas some relationships are built on personal service and deep-rooted inclusion in the form of e.g., co-creation other relationships are of more platonic character where automation and chatbots are used as primary touchpoints (Osterwalder & Pigneur, 2010). Channels refer to the specific touchpoints used to interact with the customers. This can e.g., be physical stores or online environments. Key Partners refers to the network that a business engages in to make the business work. Key Partnerships include strategic alliances and buyer-supplier relationships. Lastly the Cost Structure and Revenue Streams refer to the financial composition of the business clarifying the sources of income and costs that the previously described activities incur (Osterwalder & Pigneur, 2010).

When existing businesses adopt and apply changes to their BM components they can expect to run into structural- and cognitive barriers. Structural barriers emerge when the new assets required to adopt changes are significantly different from the existing ones (Massi & Tucci, 2013). This barrier can be substantial, e.g., if Fast Fashion businesses need to make major changes to their production in order to adopt circular BMs. Cognitive barriers are likely to materialize when conducting BMR, because organizations need to transform both mindsets and focus (Massi & Tucci, 2013). Other challenges that bigger Fast Fashion companies and incumbents in general may encounter when rethinking and redesigning their BMs are derived from their size, as sizeable organizations are generally less successful in implementing large scale changes because obtaining agile workflows and transformative culture goes against the very structure (Annosi et al., 2020). Söderlund's (2010) research conforms with these results, as his studies on the implementation of large reorganizations "*Suggests that two thirds of strategic transformation projects fail in some degree, with inadequate project management an important cause*" (p. 130).

It is apparent that there are multiple risks associated with redesign of BMs. The risks appear to be proportionally associated with the extent of the BMR (Massa & Tucci, 2013; Annosi et al., 2020). Meanwhile, not only risk-aversion but also bias can hinder rethinking and redesigning. Oftentimes new initiatives are considered disproportionately, because "*The base case of not*

investing in the innovation – the do-nothing scenario against which cash flows from the innovation are compared – is that the present health of the company will persist indefinitely into the future if the investment is not made" (Christensen et al., 2010, p. 5). Hence, redesign initiatives are more often than not compared to a baseline that assumes a static market, hence, the alternative to avoid changes is considered to yield an unchanged return. This leads to new initiatives being evaluated disproportionately; making BMR seem less profitable than it justifies (Christensen et al., 2010; Massa & Tucci, 2013).

Lastly, in the specific context of the Fast Fashion industry, drifting customer preferences driving new trends on a regular basis causes another challenge for the adoption of circular BMs, as "*Speed to market and product quality are correlated*" (McNally et al., 2011, p. 73). This means that rapid speed to market often comes at the expense of the product quality, which in this context, is a critical factor to ensure circularity (Kalmykova et al., 2018). Further, all of the interviewees suggest that circular metabolism must be slowed down, in order to achieve CE (Appx. 4; Appx. 5; Appx. 6). In sum, it is acknowledged that phase (1) of the Zero Waste Hierarchy: Refuse, Rethink, & Redesign, is the foundation of being able to implement CE (Simon, 2019), but this phase contains multiple possible pitfalls and challenges that Fast Fashion companies must navigate carefully when adopting BM reconfiguration (Massa & Tucci, 2013).

5.2.1.1. Critique and Limitations

There exists a multifold of definitions of the term Business Model. The many definitions may be an indication that making a generalized framework for a BM is difficult (Shafer et al., 2005). This is likely a result that the BM is a complex and dynamic concept subject to ongoing changes (Massa & Tucci, 2013). In this context it creates limitations for the interpretation of the concept, as it cannot be known with certainty whether Osterwalder & Pigneur's (2010) definition is the most suitable in the context of the Fast Fashion industry or whether new relevant components have been proposed in newer research. In sum, this is a consequence of industries' tendency to develop in different and inconsistent patterns which makes it hard to develop one framework to fit all sizes (MacCormack et al., 2012).

5.2.2. Value Chain

The BM identifies the structures set up in an organization that returns profits from various activities (Osterwalder & Pigneur, 2010). The value chain, on the other hand, rather "*Identifies*

the sequence of activities, from sourcing to marketing and sales, that deliver the product while returning a 'Margin' to the company" (Grigoriu, n.d.). Thus, a value chain explains how a BM is operationalized. For this reason, it finds particular importance to understand the sequence of a Fast Fashion value chain in order to understand what parts of the chain holds potential for change and will be affected by reconfiguration into more circular BMs (Grigoriu, n.d.; Massa & Tucci, 2013). According to the European Parliament (2022): "*Circularity principles need to be implemented throughout all stages of a value chain to make the circular economy a success*". Thus, circularity must be present in all parts of the value chain.

As value chains are unique and can have large differences between industries, the value chain specific for Apparel and Footwear will be used in this context to better understand the Fast Fashion Industry (Sadowski et al., 2021). According to Sadowski et al. (2021) the value chain for Apparel and Footwear consists of: (1) Raw Material Extraction, (2) Raw Material Processing, (3) Material Production, (4) Finished Production Assembly, (5) Office, Retail, Distribution Centers, (6) Consumer Use, and (7) End of life. As this thesis aims to implement an Eco-Effectiveness approach to CE, the last link in this value chain: End of life should try to be avoided, as the goal is to close the loop between Consumer Use and Production (Kalmykova et al., 2018; Sadowski et al., 2021).

Figure 6 (Sadowski et al., 2021, p. 4)

Tier 1 and lower tier-suppliers, i.e., the direct- and indirect suppliers, have received a lot of attention when discussing supply chains, as the many tiers in the supply chain makes governance impossible and damages the environment enormously (Sarker et al., 2019). Particularly, the amount of suppliers is relevant to consider in a CE perspective, as it becomes

harder to implement and enforce CE practices in external organizations. The risk of suppliers violating CE commitments has proven big in recent years, where major brands such as Nike, Adidas, Dell, Apple, and many more have been scrutinized with the uncovering of both Tier 1 & 2 suppliers violating sustainable- and circular commitments (Villena & Gioia, 2020). Thus, there is evidence that working with suppliers in distant tiers can jeopardize efforts to become sustainable, as it is difficult to enforce control and surveillance; especially as the number of suppliers grows (Sarker et al., 2019). For this reason, having many suppliers is seen as a hindrance to producing safe and circular products, as the focal company cannot ensure adequate control with production (Villena & Gioia, 2020).

Villena & Gioia (2020) performed a case study on the supply chain of several multinational corporations, showing that "*Lower-tier suppliers are also the least equipped to handle sustainability requirements. They often do not have sustainability expertise or resources, and they may be unaware of accepted social and environmental practices and regulations"* (Villena & Gioia, 2020). This creates a special challenge in governing lower-tier suppliers, as "*There's often no direct contractual relationship, and a particular MNC's business often doesn't mean that much to the lower-tier supplier"* (Villena & Gioia, 2020). As the supply chain in the Fast Fashion industries are often complex and long consisting of thousands of suppliers in various tier-links this creates a very real challenge when attempting to implement circularity into these BMs.

5.2.2.1. Critique and Limitations

The critique and limitations that followed the BM Canvas also finds relevance in this context, as the Value Chain is also an example of trying to generalize a highly individual process (Sadowski et al., 2021). This finds particularly relevance in the Fast Fashion industry where the supply chain is rather long and complex (Barnes & Lea-Greenwood, 2006). For this reason, it is recognized that Sadowski's (2021) definition, while helpful, may not be applicable to all companies within Fast Fashion. Some retailers may have longer or shorter supply chains depending on how they have chosen to compose their BM (Osterwalder & Pigneur, 2010). Furthermore, in the context of this thesis it finds relevance to challenge the framework in terms of its linearity. This depiction does e.g., not match a circular BM as it does not capture the loop-effects after consumer use (Mihelcic et al., 2003).

6. Conceptual Framework for Implementing Circular Economy in the Fast Fashion Industry

A Conceptual Framework for Circular Economy in the Fast Fashion Industry is developed, on behalf of the strengths and weaknesses of the concepts accounted for in the previous chapter. Due to the lack of a commonly accepted definition of Circular Economy (CE), there exists a gap between the research and the organizations trying to implement it (Dimensions, 2023; Purvis et al., 2019). Therefore, the Conceptual Framework of this paper dissects the different components of the various frameworks accounted for under chapter five to propose a roadmap that builds a bridge between them. According to Leonardo Rosado, "*Something interesting would be to have some low hanging fruit measure, that showcases what can be done easily, that might be very helpful*" (Appx. 5). In accordance with this, the academical contribution of this framework is ultimately to provide Fast Fashion companies with a roadmap that is easy to understand and apply, through its visual aspect and can be used for managerial purposes (Board of Innovation, n.d.)

In essence, this Conceptual Framework for Circular Economy in the Fast Fashion Industry is built upon the school of Sustainable Development, aiming to enhance all three pillars of sustainability: advancing social matters, preserving the environment, and building economic resilience, through implementation of CE (Hansmann et al., 2012; Korhonen et al., 2018). In this concept, CE, as accounted for in section 5.1, is defined as:

> "*An industrial economy in which material flows keep circulating at a high rate without entering the biosphere unless they are biological nutrients [...]; [...] that is restorative by intention; aims to rely on renewable energy; minimizes, tracks and eliminates the use of toxic chemicals; and eradicates waste through careful design [...]; [...] provides multiple value-creation mechanisms which are decoupled from the consumption of finite resources"* (Kalmykova et al., 2018, p. 194).

The framework builds upon the following hypothesis deducted from the theory reviewed under chapter five:

H1: A circular Business Model can be obtained by circulating all waste in accordance with the first four levels of the Zero Waste Hierarchy (Simon, 2019)

H2: Products have to stay within the biological- and technical cycle to be characterized as Eco-Effective (McDonough & Braungart, 2002)

H3: A company can be considered circular when all five areas of the NVCC framework are marked as green (Board of Innovation, n.d.)

H4: A company can be considered circular when all relevant initiatives proposed by Kalmykova et al. (2018) have been fully implemented in the Business Model

Consequently, the framework focuses on the implementation of initiatives throughout the supply chain that are considered non-waste or waste with full recovery according to the Zero Waste Hierarchy (Vilella, 2020; Simon, 2019). The purpose is to rethink and reconfigure the traditional highly polluting Business Models (BM)f in the Fast Fashion industry, and thus contribute to the implementation of circularity on an operationalizable level (European Parliament, 2022; Osterwalder & Pigneur, 2010). The BM is configured in accordance with a general model of a supply chain of Apparel and Footwear provided by the World Resources Institute containing: Raw Materials Extraction & Processing, Material Production & Finished Production Assembly, Office, Retail & Distribution, and Consumer Use. According to the World Resources Institute this supply chain terminates with End of Life (Sadowski et al., 2021). However, this does not align with the terminology of CE and Eco-Effectiveness, thus, this step is replaced with Return and subsequent: Reuse, Repair, and Recycle; substantiated from the technical cycle of Cradle to Cradle (C2C), the Zero Waste Hierarchy, and New Visual Conceptualization of Circularity (NVCC) (McDonough & Braungart, 2002; Simon; 2019; Board of Innovation, n.d.). To support applicability of the Conceptual Framework, selected CE implementation strategies from Kalmykova et al. (2018) are used as a primary source to exemplify how CE can be implemented through various activities. Lastly, NVCC is exploited to further transparency through visual representation to provide companies with a managerial tool to map out the progress of CE implementation (Board of Innovation, n.d.).

The deducted Conceptual Framework for Circular Economy in the Fast Fashion Industry is illustrated below, assuming a company have fully implemented CE:

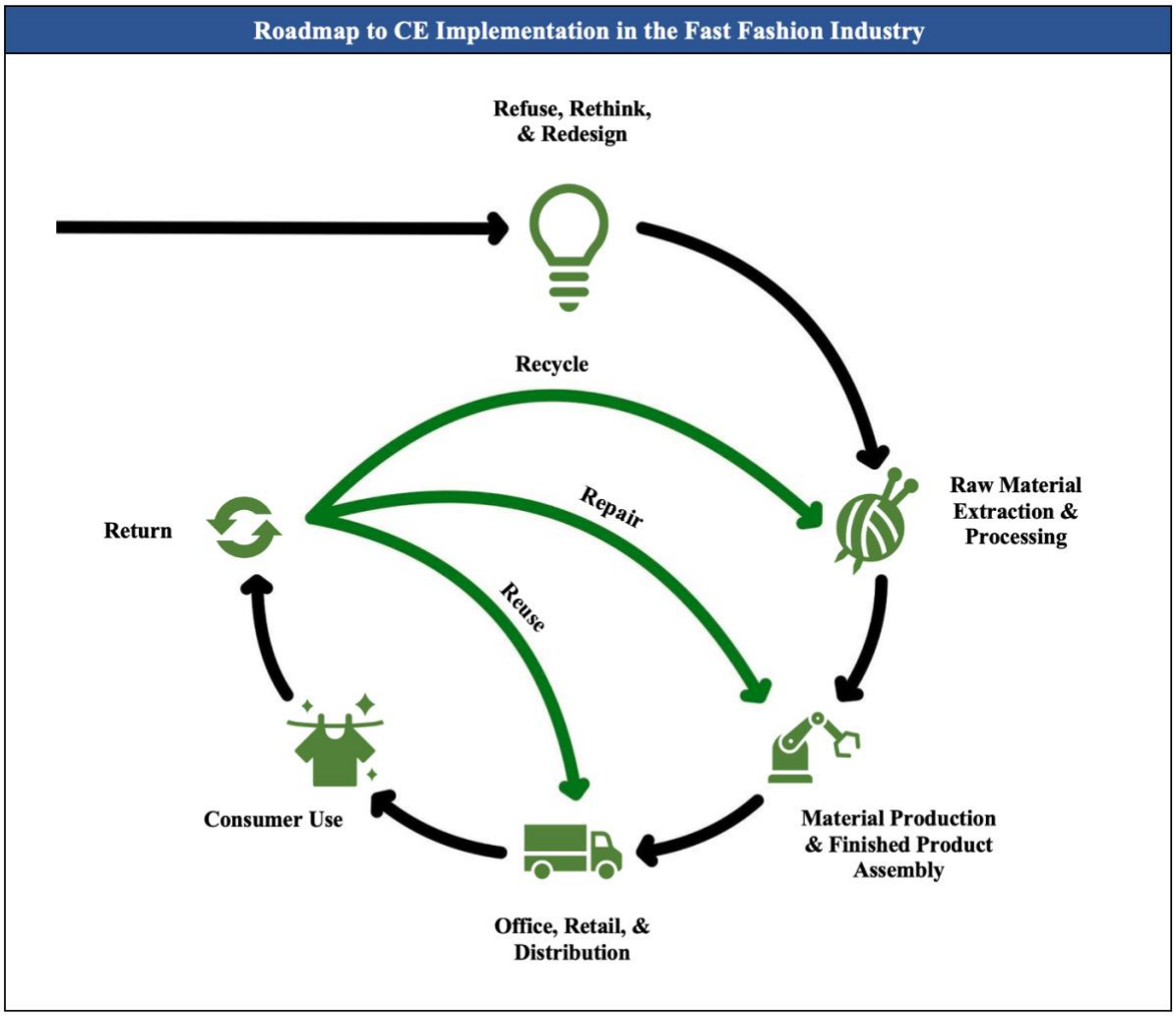

Figure 7 (Own contribution based on Sadowski et al., 2021; McDonough & Braungart, 2002; Simon; 2019; Board of Innovation, n.d.; Kalmykova et al., 2018)

Initially, the first step of the framework (beginning in the upper left corner) emphasizes that Refuse, Rethink & Redesign is a prerequisite for implementing CE in a company's Model (BM). This phase corresponds with the first level of the Zero Waste Hierarchy (Simon, 2019). The following steps of the Conceptual Framework are: Raw Materials Extraction & Processing, Material Production, Finished Production Assembly, Office, Retail & Distribution, and Consumer Use, and Return (Sadowski et al., 2021; McDonough & Braungart, 2002; Board of Innovation, n.d.). Return loops into three activities that can be used to implement CE: Reuse, Repair, and Recycle. These phases of the framework are prioritized in accordance with their

impact on the environment; indicating that the smaller the loop, the bigger the circularity, with Reuse being the most circular solution with the least impact on the environment (Simon, 2019; Mihelcic et al., 2003).

The conceptual framework developed for the purpose of this paper serves as an analytical tool, in which the visual aspects of color coding according to NVCC should be incorporated to enable companies to dissect their value chain in order to have a better overview of where to implement or increase the levels of CE (Board of Innovation, n.d.). The color coding is based on an assessment of selected initiatives presented in Kalmykova et al.'s (2018) database for Circular Economy Strategy Implementation. However, only initiatives that are assessed Eco-Effective and in alignment with the remaining theory reviewed under chapter 5 are included.

6.1. Refuse, Rethink & Redesign

The Conceptual Framework begins with Refuse, Rethink & Redesign, which reflects the first level of the Zero Waste Hierarchy (Simon, 2019). This phase is considered pivotal for CE, as all theory within Eco-Effectiveness stresses the importance of avoiding waste by focusing on design where waste is refused by rethinking the lifecycle of products rather than just reducing waste (Vilella, 2020; Simon, 2019). Thus, the planning phases that precedes production are a prerequisite to implement CE, as products that create waste are a result of a design problem rather than a consumption problem, according to Braungart et al. (2007). Hence, "*Product design with a focus on its environmental impacts during the whole lifecycle*" (Kalmykova et al., 2018, p. 196), is imperative to obtain CE.

According to this conceptualization, preventing waste or minimizing production is not the desired behavior. Focus should instead be on "*Design that considers the need to disassemble products for repair, refurbishment or recycling*" (Kalmykova et al., 2018, p. 196). Hence, Fast Fashion companies do not need to prevent or reduce their production in order to become circular (Braungart, 2020; Vilella, 2020). Instead, they need to refuse the use of harmful materials in production, rethink how they create products, and redesign their BMs accordingly so that products can stay within a continuous lifecycle either by being reused, repaired, or recycled (Simon, 2019; Kalmykova et al., 2018). For Fast Fashion companies to comply with Refuse, Rethink & Redesign, they must understand what parts of their BMs are non-circular, hence, must be redesigned (Simon, 2019). Consequently, Osterwalder & Pigneur's (2010)

Business Model Canvas will be used to determine what characterizes each building block, in order to later establish which reconfigurations are required to obtain full circularity.

As accounted for under section 5.2.1. BMR is a risky and resourceful affair (Massi & Tucci, 2013). In order to suggest the most appropriate and accurate courses of action to rethink and redesign BMs in the Fast Fashion industry to become circular, a more precise analysis of the forthcoming steps of the Conceptual Framework, going from Raw Materials Extraction & Processing to Return, will precede the recommendations determining what changes need to be made to the BMs. This sequence is assumed to decrease the overwhelming risk of failure that is associated with BMR (Annossi et al., 2020; Söderlund, 2010).

6.2. Raw Material Extraction & Processing

Raw Material Extraction & Processing is the second phase of the proposed Conceptual Framework. It investigates "*Cultivation and extraction of raw materials from the earth, plants and animals",* and *"Processing of raw materials into yarn and other intermediate products"* (Sadowski et al., 2021, 4). The extraction and subsequent processing of Raw Materials and Processing correspond to the initial process of both the biological- and technical cycle of C2C: "*The process begins with the development of the product. Consumer goods are designed in such a way that all the raw materials used can ideally be recovered without loss or damage*" (C&A, 2022). In this phase, it is imperative that Raw Materials & Processing consider the design, hence, the affect the environment in their current form and how processing of these will allow them to be Reused, Repaired or Recycled at a later time to ensure CE implementation (Simon, 2019; Board of Innovation, n.d.).

In the Apparel and Footwear supply chain, activities related to Raw Materials Extraction & Processing are typically placed with Tier 3 & 4 suppliers (Sadowski et al., 2021). Therefore, information related to these will make the basis for evaluating Raw Materials Extraction & Processing in the Fast Fashion industry. Measures that may find relevance in this regard include Scope 3 emissions, as they consider "*All the emissions associated, not with the company itself, but that the organisation is indirectly responsible for, up and down its value chain. For example, from buying products from its suppliers*" (Deloitte, n.d.). The initiatives that find relevance for increasing CE following this stage in Fast Fashion companies includes:

1. Energy Autonomy, i.e., "*The ability of an energy system to be fully functional through its own local production, storage, and distribution systems while simultaneously fostering local environmental and social goals*" (Juntunen and Martiskainen, 2021, p. 1).
2. Green Procurement, i.e., procuring goods with lower environmental impact, e.g., utilizing yarn sorts with lower emission (Kalmykova et al., 2018).
3. Life Cycle Assessment, i.e., Assessment of a product's environmental impact over its entire life cycle (Krishna et al., 2017)
4. Material substitution, i.e., replacement of raw materials for materials that are more renewable or produce less waste (Kalmykova et al., 2018; Simon, 2019). In alignment with the definition provided by the Zero Waste Hierarchy: Raw Materials stemming from Recycled sources qualify as waste with full recovery, and thus aligns with the definition of Materials Substitution in this context (Simon, 2019).

6.3. Material Production & Finished Production Assembly

The third- and fourth phases: Material Production & Production Assembly are closely related as they consider "*Production and finishing of materials (e.g., fabric, trims) that go directly into finished product"* and "*Assembly and manufacturing of final products"* (Sadowski et al., 2021, 4). This corresponds to the first and second phase of the technical cycle of C2C: Production and Product (C&A, 2022; McDonough & Braungart, 2002). However, as Sadowski et al. (2021) definition is based on the Apparel and Footwear supply chain and offers a greater level of detail this distinction is used in the Conceptual Framework, to achieve a greater level of detail and relevance. Activities related to Materials Production & Finished Production Assembly usually also reside outside of the focal firm's control in the Apparel and Footwear supply chain (Sadowski et al., 2021). For this reason, information related to these activities will again be reflected in indirect measures such as Scope 3 emissions (Deloitte, n.d.). The solutions a company can implement during this stage to implement CE include:

1. Energy Effectiveness, i.e., Implementing processes that enable more effective use of energy by e.g., reducing consumption or using renewable sources of energy (Kalmykova et al., 2018), as they represent "*A key aspect of producing circular products and resources, including the way in which the components of renewable plants are designed, manufactured, built and managed*" (Enel Green Power, n.d.)

2. Material Productivity, i.e., *"The amount of economic output generated [...] per unit of materials consumed"* (OECD, n.d.).
3. Agile Manufacturing, i.e., *"a business-wide mindset characterised by a significant emphasis on routinely adaptable structures and infrastructures and enhanced access to global competencies as a means of achieving greater responsiveness to rapidly changing customer requirements.*" (Gunasekaran et al., 2019, p. 5154).
4. Customization & Made to Order, i.e., products are made to meet the customers need and preference this can e.g., be achieved through production upon order (Kalmykova et al., 2018)
5. Design for Disassembly & Recycling i.e., Preparing products for recycling by using few different materials so later disassembly can be executed using less resources (Kalmykova et al., 2018; McDonough & Braungart, 2002)

6.4. Office, Retail, & Distribution Center

Office, Retail and Distribution Center represent the fifth phase of the Conceptual Framework. This phase takes into consideration "*Corporate real estate not involved in the production process"* (Sadowski et al., 2021, 4). This phase represents activities which are typically within the control of focal firms in the Apparel and Footwear supply chain (Sadowski et al., 2018). The solutions a Fast Fashion company can implement during this stage are similar to Material Production. For this reason, some of the same indicators find relevance. Meanwhile, measures hereto will typically reflect direct consumption and waste generation via e.g., Scope 1 & 2 emissions, as these reflect either direct or indirect emissions (Deloitte, n.d.). The initiatives a Fast Fashion company can implement during this phase include:

1. Energy Effectiveness, i.e., Implementing processes that enable more effective use of energy by e.g., reducing consumption or using renewable sources of energy (Kalmykova et al., 2018)
2. Internal Waste Management including Optimized Packaging design i.e., using waste free packaging which will in turn reduce the generation of waste (Kalmykova et al., 2018; Zero Waste, 2020)

6.5. Consumer Use

The sixth phase: Consumer Use, refers to how the company can impact or nudge the consumer to make informed decisions that serve the environment (Sadowski et al., 2021). This phase

corresponds to the third level of the technical cycle of C2C: Consumption/ Use (C&A; 2022) and Use in the NVCC framework (Board of Innovation, n.d.). This phase represents the points of contact between a company and its consumers. In this phase channels such as employees, stores, and labels can be exploited to increase consumers' knowledge about the products, thus, allowing them to make purchase decisions on a more informed basis (Osterwalder & Pigneur, 2010; Kalmykova et al., 2018). Further, CE initiatives related to this phase can benefit the Customer Relationship as well as advance the product life cycle, as consumers become aware of how they can prolong the life of their products (Sadowski et al., 2021; Osterwalder & Pigneur, 2010). The solution a Fast Fashion company can implement during this stage include:

1. Energy Effectiveness, i.e., implementing processes that enable more effective use of energy (Kalmykova et al., 2018). According to the Greenhouse Gas Protocol, in this phase Energy Effectiveness related to "*Products that indirectly consume energy (fuels or electricity) during use"* (Barrow et al., 2015, p. 113). In the apparel industry, Energy Effectiveness is typically associated with the quality of garments, need for maintenance and washing (Kalmykova et al., 2018; Barrow et al., 2015).
2. Eco-labeling, i.e., labeling products with less environmental impact or increased circularity to guide consumers' purchase decisions (United Nations Environment Programme, n.d.).
3. Product-labeling, i.e., providing full information on the raw materials, origin, and environmental benefit of products to allow the consumer to make informed decisions (Kalmykova et al., 2018; Simon, 2019).
4. Community Involvement, i.e., *"Organizing sharing platforms and providing guidance on product repair and replacement"* (Kalmykova et al., 2018, p. 196).
5. Virtualization, e.g., online shipping (Kalmykova et al., 2018).

6.6. Return

The seventh component of the Conceptual Framework is: Return. This phase reflects the middle stages of the technical C2C cycle preceding disassembly (C&A, 2022; McDonough & Braungart, 2002), and step two in NVCC (Board of Innovation, n.d.). It is determined that this phase is essential to implement CE in the Fast Fashion industry as an abundance of waste results from the take-make-throw away behavior that dominates the industry (European Parliament, 2022; ReHubs, n.d.). In this regard, Madumita Sadagopan explains "*Where I saw the challenge was in returning the waste to the manufacturer*" (Appx. 4). According to the European

parliament (2022) this is *"Partly due to inadequate technology".* Thus, the Return of Fast Fashion items may represent a hindrance to CE implementation in the current industry. Nonetheless, it is a prerequisite for CE as this phase is a gatekeeper for Fast Fashion companies to keep their products in constant circulation (C&A, 2022; McDonough & Braungart, 2002). Further, enforcing Return corresponds with the principle of "*Extended Producer Responsibility (EPR) – where producers are responsible for the environmental impacts of their products when they become waste – is an important environmental policy instrument*" (Hilton et al., 2019, p. 7). EPR is an important tool to increase Return and subsequent Reuse, Repair & Recycling as it holds producers accountable for the products they place on the market (Hilton et al., 2019).

Instruments used to enforce ERP and Return include are Efficient Take Back and Logistics Systems, i.e. *"An [efficient] initiative organized by a manufacturer or retailer, to collect used products or materials from consumers and reintroduce them to the original processing and manufacturing cycle"* (World Business Council for Sustainable Development, n.d.). If efficient systems are not implemented, companies cannot control the lifecycle of the products and prevent Cradle to Grave (C&A, 2022; Korhonen et al., 2018). The biggest challenge companies face in implementing and enforcing safe Return of their products is in the Customer Relationship. Nonetheless, research on this area shows that "*Customers who are satisfied with the products will return to the manufacturer to extend the service life of the products and keep their preferred features. Customer loyalty to the manufacturer is built in*" (Kalmykova et al., 2018, p. 197). Accordingly, return of products is closely related to satisfaction and loyalty showing that system thinking is needed to support a circular BM. For this reason, incentives in the form of e.g., Member benefits or discounts can be used to reward consumers who participate in Return (Kalmykova et al., 2018). Subsequently, the initiatives a company can implement to enforce Return include:

1. Efficient Take Back and Logistics Systems, as "*Efficient take-back systems ensure that the products are recovered from the consumer after end of life and proceed to be remanufactured. Take-back systems could ensure a continuous flow of material for remanufacture*" (Kalmykova et al., 2018, p. 196).
2. Incentive for Return, i.e., providing rewards for repeated return of products, e.g., deposit refund or vouchers when consumers make loop products back to the producer rather than dispose of them (Kalmykova et al., 2018)

6.6.1. Reuse

Assuming the safe Return of products, the continuous circulation can conclude three activities: Reuse, Repair, or Recycle. These three activities are derived from the NVCC framework (Board of Innovation, n.d.). Based on the literature review of Zero Waste, it is known that the activities following Return have different priorities, by which Reuse is the most circular initiative, as "*The inner loops of reuse and remanufacturing are preferred, requiring less raw materials, energy, time, and cost. These efforts to invoke LCA [Life Cycle Assessments] have been successful at reducing waste, pollutants, and energy use for a number of industries*" (Mihelcic et al., 2003, p. 5315). For this reason, the initiatives are prioritized with Reuse as the highest level of CE according to this Conceptual Framework which is visualized by a smaller loop (European Commission, 2023; Simon, 2019; Korhonen et al., 2018).

Reuse of products is equivalent to "*Product-life extensions for goods*" (Kalmykova et al., 2018, p. 194). Thus, Reuse of products allows products to stay in an unchanged product life cycle for longer as Reuse does not require processing or alterations. In this phase "*The goal is to prevent them [products] from being discarded and instead find ways for them to go back in the economy*" (Simon, 2019). One way to enforce Reuse is through Direct Secondary Re-usage by facilitating a connection between the initial and potential consumer (Kalmykova et al., 2018). The initiatives a company can implement during this stage include:

1. Product as a Service, i.e., The producer remains the owner who provides design, maintenance, repair, and recycling while the consumers rent the product for the time of usage (Kalmykova et al., 2018).
2. Redistribute and Resell, i.e., facilitate opportunities for reselling and redistributing to extend the products lifetime (Kalmykova et al., 2018).
3. Direct secondary re-use: when the company re-use a good at the end of its use phase without destruction of the existing product design (Kalmykova et al., 2018; Simon, 2019)

6.6.2. Repair

Products are not always eligible for Reuse. On some occasions this is due to damages or malfunctions in the products (Board of Innovation, n.d.). If the products still have a use but are faulty it is recommended on the basis of this framework that they are Repaired, which refers to the process of "*Rebuilding a product by replacing defective components by reusable ones*"

(Kalmykova et al., 2018, p. 197). This option is also reflected in one of the opportunities suggested in the NVCC framework (Board of Innovation, n.d.). Furthermore, Repair is equivalent to the third level of the Zero Waste Hierarchy: Preparing for Reuse, as it "*Reproduces the efforts to clean, repair and refurbish items that have become waste in order for them to become products again*" (Simon, 2019). According to the Zero Waste Hierarchy this CE initiative ranks below Reuse but above Recycling, as products are maintained in their primary form rather than requiring separation of waste to enter into new production (Simon, 2019). One of the most effective ways to implement Repair into a BM is by offering ongoing maintenance either for prevention or when a damage has happened. This can in turn benefit consumer satisfaction and loyalty (Kalmykova et al., 2018, p. 197). The solutions a company can implement during this stage therefore include:

1. Upgrade, Maintenance & Repair (Kalmykova et al., 2018; Board of Innovation, n.d.)

6.6.3. Recycle

The final option to prevent waste, and stay within an Eco-Effective CE, is to Recycle. The option qualifies as waste with full recovery according to the Zero Waste Hierarchy (Simon, 2019), and reflects the second stage in the NVCC (Board of Innovation, n.d.). Further, Recycle corresponds to the overall goal for products in the technical cycle according to C2C (McDonough & Braungart, 2002). What distinguishes recycling in the Return phase from the Material Substitution in the Raw Material Extraction & Processing phase, is that the amount Recycled in this phase is contingent by the Return of the product (McDonough & Braungart, 2002; C&A, 2022). Whereas Material Substitution is concerned with replacing virgin material with recycled in general, Functional Recycling only qualifies the amount recycled by the company itself as recycled.

Recycling is a technique in which "*Byproducts from other manufacturing processes and their corresponding value chains are used as raw materials for manufacturing new products*" (Kalmykova et al., 2018, p. 196). Oftentimes, this process is associated with a loss of quality or functionally, as products are disassembled, separated, and turned into new secondary raw material (Kalmykova et al., 2018; Simon, 2019). Consequently, Recycling is seen as the least desirable option, as it prevents waste but at the cost of quality and additional waste production. Furthermore, as illustrated in C2C this process requires disassembling of the returned products to prepare them for new production (McDonough & Braungart, 2002, p. 109). Thus, to administer Recycling a company must acquire appropriate resources in the form of machines,

employees etc. (Kalmykova et al., 2018). The initiatives to foster CE initiatives in this phase include:

1. Functional Recycling. i.e., *"When the full function of a material is retained and utilized in next use"* (Diener & Tillman, 2015)
2. Increasing By-products Use & Downcycling, i.e., when byproducts from other processes are used as raw material for new products or when returned garments are downcycled for new products with a lesser functionality (Kalmykova et al., 2018)

6.7. Visualization

To visualize whether companies have implemented the initiatives related to CE, the visualization techniques from the NVCC framework will be exploited to make implementation of CE accessible and transparent. Using visualization tools can help draw connections between the complex building blocks of a BM, as is required to apply a system thinking perspective (Board of Innovation, n.d.; Appx. 5). Further, its simplicity makes it easier to implement, and allows for discussion (Appx. 5)

To rectify some of the critique the NVCC framework can be subject to, the color scheme will be advanced with explanations that clarify what each color represents. Whereas NVCC uses only red, grey, and green to illustrate whether the company's impact is respectively negative, neutral, or positive, an additional shade of green will be added to be able to both acknowledge improvement that enables the BM for CE implementation as well as full implementation. This distinction is added as this thesis seeks to encourage companies to implement CE, and not avoid it if the current resources or technology does not allow for complete CE translation. This conforms with Kevin Shahbazi's perspective that "*You should set more ambitious target to tap into the potential of organizations to find creative solution and to underscore the urgency and not have a type of complacency. And I've seen organizations not meet their targets and that's OK, emmm I mean, maybe that is not OK, but it's better than setting lower targets and succeeding*" (Appx. 6). This means that the framework operates within the following color scheme: red, grey, light green, and dark green.

The color Red is attributed when the companies' BMs are not equipped for the CE initiative in question. This color is given when a company has not implemented the initiative into its BM or when implementation has failed. The color grey is associated with inconclusive results,

hence, if evidence shows ambiguous results on whether the BM is ready to implement the CE initiative, this score is granted. This can e.g., be if the initiative is present in the current BM but the viability of it in terms of measurable effect is not clear, or the impact is insignificant. A light green color is used when there is enough evidence to conclude that the BM is equipped for implementation of the CE initiative, but it has not yet reached its full potential, hence, not been fully implemented. This score would e.g., be given if a company has implemented Green Procurement to most, but not the entire value of procurement. Lastly, a dark green color is used to describe when the CE initiative has been successfully implemented into the BM, and thus, fulfills its full potential. This color is attributed if e.g., Upgrading, Maintenance and Repair are offered across all stores and markets and are used actively by consumers. Following provides an overview of the visualization scheme:

BM not equipped for CE initiative	Inconclusive results	BM equipped for CE initiative	Initiative fully implemented in BM

To be able to deduct a systems approach, hence, draw a visual roadmap of how Fast Fashion companies are implementing CE throughout their entire value chain, a color will be attributed for each initiative as well as for each supply chain link of the Conceptual Framework. The color for the overall phase will be given on an assessment of the individual initiatives and their assumed impact according to the companies using the framework rather than based on a weighted average or the like. This method for scoring is chosen in part because the ambition with making a visual framework is to make it easy-to-use rather than complicated. Second, a weighted average would require in-depth knowledge about the waste generated in each link of the value chain and the expected impact of each initiative in order to make a fair comparison. In practice this means that the assessment of the overall trade-offs and implementation of CE in each phase should be made by the company applying the framework, to allow them to give more weight to initiatives that for them specifically are more relevant than others.

6.8. Critique and Limitations

It must be mentioned that the following framework is deducted from various theories related to CE and BMs. Therefore, the framework would have to undergo several tests of falsification before it could be adopted as a premise. Furthermore, it must be stated that the framework is built on interpretations of various research and frameworks, which makes it vulnerable to both

researcher error and researcher bias (Saunders et al., 2012). In this regard, Generalizability, i.e., External Validity also suffers under the fact that the framework is specific to the Fast Fashion industry and cannot be assumed to find relevance in other industries. Thus, further tests would have to explore its Generalizability (Saunders et al., 2012). Meanwhile, it is recognized that the framework, being built on the basis of a Fast Fashion BMs and supply chains, would likely find more relevance in similar production BMs rather in Service BMs where the supply chain is significantly different (Sadowski et al., 2021; Appx. 6).

In terms of circularity and C2C, it is noteworthy to mention that the framework is delimited to only consider the technical cycle, as the thesis investigates the Fast Fashion industry (McDonough & Braungart, 2002). The technical development of the Raw Materials used in the Fast Fashion industry is currently not made of biodegradable materials, and the BMs are therefore not designed for production of such, thus, it would not be realistic to consider the biological cycle in this thesis (Sadowski et al., 2021; C&A, 2022). However, it is recognized that subparts of the production or materials not directed associated with the primary production might be relevant to consider according to the biological cycle. In addition, it is likely to assume that the biological cycle would find relevance in other industries, for which reason generalizability is not necessarily broad. Meanwhile, the roadmap is developed with the intent to implement immediate CE in the Fast Fashion industry, for which reason a broader generalization of the framework would compromise the managerial implications. However, it is acknowledged that new theories and technology may be introduced to the industry which can change not only the initiatives related to each phase of the Conceptual Framework but potentially also the composition of the supply chain and loops (Appx. 6).

Lastly, the visualization of the roadmap relies on a non-weighted color scoring concept, which fails to properly give weight to the initiatives under CE following the Zero Waste Hierarchy (Simon, 2019). This means that the waste management practices: Reuse, Repair, and Recycle are treated indifferently despite the roadmap's attempt to depict that inner loops are concerned with a higher level of CE according to Zero Waste (Mihelcic et al., 2003; Simon, 2019). Nonetheless, the division of CE practices from the Zero Waste Hierarchy are ultimately not included, as this is not the area of research or objective of this paper. However, it is acknowledged that it could find relevance as a study for further research (Saunder et al., 2012).

7. Circular Economy Implementation in the Fast Fashion Industry

Several sources considering Circular Economy (CE) in the Fashion industry have reached the same conclusion that: "*Sustainable fashion and circularity in the textiles value chain are possible, yet this century the world's consumers are buying more clothes and wearing them for less time than ever before, discarding garments as fast as trends shift*" (United Nations Environment Programme, 2022). Meanwhile, results show no indication that the Fast Fashion industry has managed to reduce its negative environmental impact (Terrell, 2012; Sadowski et al., 2021). On the contrary, the production of Fast Fashion "*Has more than doubled in the past quarter century — three quarters end up burned or buried in landfills*" (Pucker, 2022). Consequently, the Fast Fashion industry contributes to tremendous waste worldwide, as a result of production that emphasizes price and speed-to-market over design for sustainability (European Parliament, 2022; Hayes, 2022). Maybe for these reasons, "*The fast fashion business model of quick turnover, high volume, cheap prices is under pressure from consumers who are demanding change. They want resilient garments from a sustainable industry*" (United Nations Environment Programme, 2022). Nonetheless, it is difficult for companies in the Fast Fashion Industry to change their Business Models (BM), even though these might not be feasible in the long run (Sadowski et al., 2021; United Nations Environment Programme, 2022). Therefore, the following analysis will consider the current composition of the Fast Fashion industry and assess how Inditex and H&M Group (HMG), the current market leaders in the European Fast Fashion industry based on turnover, are currently contributing to CE (Statista, 2022).

To understand the corporate landscape that the case companies operate in, this analysis is initiated with a clarification of the concepts: Fashion and Fast Fashion. Thereafter, the analysis will proceed to apply the Conceptual Framework developed under chapter 6 to the case companies: Inditex & HMG, starting with an analysis of the case companies' BMs to later be able to discuss what Business Model Reconfigurations (BMR) are needed to Refuse, Rethink & Redesign in alignment with CE (Simon, 2019). Inditex and HMG's contribution to CE will be assessed through a thorough analysis of their current level of CE implementation in the following links of their value chain: Raw Materials Extraction & Processing, Material Production & Finished Production Assembly, Office, Retail & Distribution, Consumer Use, and Return: Reuse, Repair, and Recycle (Sadowski et al., 2021). The goal is to prepare a visual representation of the current impact of their CE initiatives in each step of their value chain (Board of Innovation, n.d.; Kalmykova et al., 2018). The visual representation is based on an

assessment of whether their BMs are equipped for CE implementation, and rated according to: BM not equipped for CE initiative; inconclusive equipment for CE initiative; BM equipped for CE initiative; Initiative fully implemented in BM. The ambition is to enable an overview of the case companies that makes it easy to locate where in their value chain improvements can be made and allow for discussion (Appx. 5).

7.1. Overview of the Fast Fashion Industry

Fashion is a man-made concept that refers to "*Style or styles of clothing and accessories worn at any given time by groups of people*" (Major & Steele, 2023). The concept surfaced in the beginning of the 20th century with the rise of capitalism and new technologies which led to an outburst of factories and new stores (Major & Steele, 2023). Originally fashion was sold over the counter in retail stores. However, since the turn of the millennium, the market has seen much growth resulting in a myriad of sub-industries including High Fashion, Haute Couture, Slow Fashion, Fast Fashion, and Ultra-Fast Fashion (Terrell, 2012). This has inevitably resulted in a "*Multibillion-dollar global enterprise devoted to the business of making and selling clothes*" (Major & Steele, 2023). Fast Fashion is a counter response to the long complex structures and long buying cycles that characterize the more exclusive High Fashion- and Haute Couture industries (Camargo et al., 2020). Fast Fashion *"Is a term used by retailers for designs that move quickly from the catwalk to the store in order to capture current fashion trends*" (Terrell, 2012). Consequently, the supply chain is shortened, reducing the number of processes in the buying cycle, hence, the lead time (Bruce et al., 2004). To accommodate the consumer demand for newness the product range is constantly renewed in order to attract attention (Barnes & Lea-Greenwood, 2006).

Fast Fashion is an old business strategy; however, the industry is increasingly evolving, with the latest revolution being Ultra-Fast Fashion, which has an even faster approach than Fast Fashion, allowing companies to go from design to sale in a matter of days (Camargo et al., 2020). Since the rise of Fast Fashion in the early 2000's, the industry has both challenged and revolutionized the Fashion industry in general (McNeill and Moore, 2015; Bruce et al., 2004). Meanwhile, the low prices and fast lead times that characterize Fast Fashion often come at a compromise of the quality, as products are less resilient and harder to repair and resell, because the quality is simply not equipped for a long life cycle (Sadowski et al., 2021). Ultra-Fast Fashion is a highly relevant submarket, as "*Ultra-fast fashion could potentially impact current*

fast fashion retailers to partially move their business model and operations towards an ultra-fast approach". Nonetheless, this analysis is delimited to only consider the Fast Fashion market.

The Fast Fashion Industry has highly impacted consumer behavior to apparel consumption, creating a culture of impulse buying and a constant demand for newness (Barnes & Lea-Greenwood, 2006). This proposes a serious problem, as the reconfiguration of the industry has influenced the general apparel buying cycle, and shortened the time to react to certain trends, and made consumers more fashion conscious and wanting to acquire the latest style promptly (Camargo et al., 2020). Traditionally, the replenishment was conditioned by the four traditional seasons, however, due to this change in attitude the industry has increased the number of recognized fashion seasons (McNeill and Moore, 2015). This culture, along with the practices associated with Fast Fashion production have jeopardized environmentally sustainable practices (European Parliament, 2022).

7.1.2. Current Business Models

As with many other businesses in the Fast Fashion industry, Inditex advocates that their "*Vision of circularity encompasses our [Inditex's] entire business model [...] The aim is to be more resilient and efficient in the long term, working to turn waste into a new resource*" (Inditex, 2023a, p. 185). Accordingly, HMG emphasizes that the company seeks to "*Lead the change towards a circular fashion industry*" (H&M Group, 2023b, p. 4). Osterwalder & Pigneur's (2010) nine building blocks described under section 5.2.1. will be utilized in the following to describe Inditex's and subsequently HMG's current BMs. The ambition is to unfold the potential in the Fast Fashion industry to implement CE through: Refuse, Rethink & Redesign (Simon, 2019). This knowledge will be used to identify what components of the BM must undergo reconfiguration to become more circular in chapter 8 (Osterwalder & Pigneur, 2010; Massa & Tucci, 2013). The analysis will be based on the respective companies' performance in the Reporting period of 2022 - unless otherwise stated.

7.1.2.1. Inditex's Current Business Model

Inditex is a global Fast Fashion company headquartered in Spain. The organization is present in 94 geographical markets and operates more than 6,000 stores. Its strongest presence is in its home market: Spain, where more than 1,200 of its stores are located (Inditex, 2023a). Their activities are focused on Business-to-Consumer sales through their eight brands which includes

"*Zara, Pull&Bear, Massimo Dutti, Bershka, Stradivarius, Oysho and Zara Home*" (Inditex, 2023a, p. 28). These cover some of the largest Fast Fashion brands in Europe which provides Inditex with a significant share of the market. Inditex's goal is to evolve their business in a sustainable direction. Consequently, a part of their ambition is to reach net-zero emissions by 2040 (Inditex, 2023a). According to the Science Based Targets initiative, a net-zero standard aims to "*Reduce scope 1, 2, and 3 emissions to zero or to a residual levels*" (Science Based Target, 2021, p. 8).

Key Activities, Value Propositions & Key Resources

Inditex's Key Activities "*Consists of offering the latest fashion trends (clothing, footwear, accessories and household textile products) to meet customer demands, using high quality and sustainability standards and at attractive prices*" (Inditex, 2023a, p. 28). These Key Activities are operationalized through their more than 6,000 stores and supplemented with online environments for every brand. Inditex's brands and stores constitute a Key Resource for them, as it allows them to offer a wide variety of trends across a broad market. Zara is the biggest brand contributing to more than 70% of revenue (Inditex, 2023a). According to Inditex its primary drivers, hence, Value Propositions, include that they are adaptable to new trends and carry a high quality at attractive prices (Inditex, 2023a; Osterwalder & Pigneur, 2010). Moreover, "*Inditex can develop a new product and have it ready in stores within two weeks*" (Ozdil, 2020). The fast lead time is one of Inditex's strongest Points of Differences, as they are able to execute new designs in record time compared to the traditional cycle in the Fast Fashion industry which can take several months (Aftab et al., 2018). The trends in Inditex are created by "*A team of more than 700 designers that contribute exceptional talent, unfettered creativity and in-depth knowledge of the customers they create for*" (Inditex, 2023a, p. 126). Thus, designers are also considered a Key Resource for Inditex.

Customer Segments, Channels & Customer Relationship

Inditex is targeting a broad mass market focused on women aged under 30 years, but they also carry lines for men which constitutes 25% of their market. Furthermore, they carry assortments for home and children; but these are not the primary categories in Inditex's portfolio of products (Aftab et al., 2018). Inditex supplies their customers through two channels: retail stores and online environments, with retail stores being the largest sales channel as it makes up 77.5% of revenue (Inditex, 2023a). Inditex's Channels make the basis for Inditex's Customer Relationship where focus is on encouraging a pleasing and "*Seamless shopping experience*"

(Inditex, n.d.a). In alignment with this strategy Inditex offers their customers the opportunity to create accounts via their different brands to access features that enhance the shopping experience like e.g., "*Receive notifications about your orders and news in the APP*" (Zara, n.d.). At the same time, Inditex largely deviates from running sales or offering discounts. This is a strategy to enforce a high perceived value of their items and to ensure efficient stock turnover (Cornejo, 2023).

Revenue Streams & Cost Structure

In 2022 Inditex obtained net sales of €32.6 billion resulting in a net profit of €4.2 billion corresponding to 12,7% of net sales. This result showed an average gross margin of 57% which is a relatively high margin compared to e.g., HMG (Inditex 2023a; H&M Group, 2023a). The result showed a growth in sales of 17.5 percent points versus the previous fiscal year. The majority of sales in Inditex is realized through one-time customer transactions, which make up 91%. The revenue streams from retail stores are split between company managed stores vis-à-vis franchised managed stores. Franchise fees make up around 8% of Inditex's net sales (Inditex, 2023a). Inditex's revenue streams are predominantly a result of one-time customer transactions. However, Inditex has recently also implemented the Zara Pre-Owned platform for their biggest brand Zara. The platform facilitates revenue through reuse-, reselling-, and repair services. Meanwhile, the platform is currently only available in the United Kingdom, for which reason it is not assumed to be responsible for substantial income (Kalmykova et al., 2018; Inditex, 2023).

Inditex's costs in 2022 before EBITDA amounted to €23.9M, corresponding to 73.4% of net sales. The biggest cost, making up 59%, was: cost of sales, covering primarily raw materials and consumables such as textile. Operating expenses made up the remaining 41% of costs, which included: personnel costs (20%), cost related to stores and online operations (11%), and administrative expenses and maintenance (11%) (Inditex, 2023a). Further, Inditex is always looking for projects and investments that support their BM. This meant that €87.9 million was directed for various strategic investments in 2022, out of which €20.2 million (26%) were earmarked investments towards sustainability and CE. Among others, they made a "*Venture investment in CIRC, an innovative start-up that promotes a disruptive recycling technology with the aim of generating new sustainable fibres for use in the textile industry*" (Inditex, 2023a, p. 112).

Key Partners

As stated previously, a smaller part of Inditex's retail stores are franchised. These franchise takers make up one of Inditex's Key Partners. In regard to the rest of their business, Inditex has extensive control over their distribution and retail channels (Aftab et al., 2018). Meanwhile, their upstream activities including raw materials extraction and production are facilitated in a global value chain outside of the focal firm. Inditex's global value chain begins with a network of "*1,729 direct suppliers located in 50 markets who, in turn, used 8,271 factories to make our [Inditex's] products*" (Inditex, 2023a, p. 214). The suppliers are located in 12 strategic supplier clusters that contribute to a fast lead time (Inditex, 2023a). Considering their Key Activities, suppliers are considered Key Partners for Inditex as they are crucial to achieve not fulfill the company's Value propositions and purpose (Osterwalder & Pigneur, 2010).

In summary Inditex's BM has the following composition:

<table>
<tr><th colspan="5">Business Model Canvas</th></tr>
<tr><th>Key Partners</th><th>Key Activities</th><th>Value Proposition</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr><td rowspan="3">Franchisees

Suppliers</td><td>Offering the latest fashion trends</td><td rowspan="3">Adaptable to new trends

Attractive prices

High quality

Sustainability Standards

Fast lead time</td><td>Interactions in physical stores and online
→ Focus on a pleasing and seamless shopping experience</td><td rowspan="3">Mass market (94 countries)
→ women</td></tr>
<tr><td>Key Resources</td><td>Channels</td></tr>
<tr><td>Physical retail stores

Multiple brands

In-house designers

Agile supply chain management</td><td>Retail (77.5%)

Online (22.5%)</td></tr>
<tr><th colspan="2">Cost Structure</th><th colspan="3">Revenue Streams</th></tr>
<tr><td colspan="2">Raw materials and consumables (59%)

Personnel costs (20%)

Store and online operations (11%)

Administrative expenses (11%)</td><td colspan="3">Direct sales - retail and online (91%)

Fees from franchise holders (8%)

Other (1%)</td></tr>
</table>

Table 3 (Own contribution based on Inditex, 2023a: Osterwalder & Pigneur, 2010)

7.1.2.2. H&M Group's Current Business Model

HMG is a global Fast Fashion company, with headquarters in Sweden, operating physically in 79 geographical markets. HMG is mainly a Business-to-Consumer brand, owning some of the largest Fast Fashion brands which grants them control over substantial market shares. The respective brands are H&M, H&M Home, H&M Move, COS, Weekday, & Other Stories, Arket, and Monki. H&M is the biggest brand owning 89% of the total 4,414 stores (H&M Group, n.d.g.; H&M Group, 2023a). As Appx. 7 suggests, each brand has its own identity, offering different products, styles, and price points, however, they all serve the same goal, which is to *"Make fashion and design accessible to everyone"* (H&M Group, 2023a, p. 73). Similar to Inditex, HMG also strives towards a more sustainable BM, for which reason they share the ambition to reduce all their emissions to net-zero by 2040 (H&M Group 2023b).

Key Activity, Value Proposition and Key Resources

The Key Activity of HMG consists of "*Sales of clothing, accessories, footwear, cosmetics, home textiles and homeware"* (H&M Group, 2022a, p. 6). Their Value Proposition related to this activity is to offer value for money, as each brand seeks to "*Meet customer's demand for the best combination of fashion, quality and sustainability at affordable prices*" (H&M Group, 2022a, p. 6). Thus, HMG seeks to ensure a relevant assortment that closely follows trends. Consequently, one of their Key Resources is their efficient value chain management that allows the company to maintain low prices by keeping expenses down and replicating trends to keep up the volatile demand from customers (Camargo et al., 2020). HMG emphasizes that "*Speed, availability, cost efficiency and accuracy are decisive key factors for achieving this [maximize customer satisfaction]* " (H&M, 2023a, p. 37). Furthermore, with eight strong brands, all with slightly different target groups, assortments, and brand identities, HMG succeeds in satisfying a large part of the market (H&M Group, 2023).

Customer segments, Channels and Customer Relationships

Through HMG's eight clothing brands, the company seeks to serve the mass market. While some of the brands, such as & Other Stories and Monki only focus on providing fashion, beauty, and accessories for teenage girls and women, the majority of the brands have a larger offering, including men, and sometimes children and kids (H&M Group, n.d.a). With the short life cycle, and volatile demand in Fast Fashion, the Customer Relationship in the industry is rather limited, however, increasingly important to build (Arrigo, 2018). HMG seeks to foster

Customer Relationships through a loyalty program for H&M, H&M Home, and H&M Move, allowing the customers benefits such as exclusive discounts, special member prices, reduced delivery expenses, and vouchers (H&M, n.d.d).

Further, HMG has a large focus and accessibility, ensuring that customers are *"Able to shop and be inspired where, when and how they choose"* (H&M Group, 2023a, p. 75). Thus, HMG carries out an omni-channel solution with stores, websites, digital marketplaces, and social media. Currently HMG have online stores in 58 of the 79 markets they currently operate in, i.e., 73.4% (H&M Group, 2022a; H&M Group, 2023a). The majority of the revenue streams stem from the physical stores that account for 70% of the sale. In relation to the omni-channel strategy HMG emphasizes that "*The stores play a vital role in our [HMG] relationship with our customers*" (H&M Group, 2022a, p. 25), but that "*The online stores are a great compliment to the physical store […] [and are] enabling customers to interact and engage with us [HMG] were, when and how they choose*" (H&M, 2022a Group, p. 26).

Revenue Streams and Cost Structure

In 2022 HMG's net sales amounted to €19.7 billion, indicating a 12 percent points increase from the previous fiscal year. Overall HMG obtained a net profit of €320.9 million corresponding to 1.6% of net sales with a gross margin of 50.7% (H&M Group, 2023a). In general, HMG's revenue streams primarily stem from one-time customer transactions. Further, HMG recently introduced garment rental in H&M, and a new second-hand market: Sellpy, in search of adding new value streams and utilizing their size to influence the industry positively. However, as these new initiatives are still at the early stages in a limited number of markets, it is assumes the vast majority of revenue come from their Key Activity, i.e., "*Sales of clothing, accessories, footwear, cosmetics, home textiles and homeware"* (H&M Group, 2022a, p. 6; Farmbrough, 2019).

HMG's total costs in 2022 before EBITDA amounted to €19 billion, corresponding to 96.8% of their net sales. The largest costs were the costs of goods sold (64.3%), which includes *"Design, producing and transporting the goods to distribution centres"* (H&M Group, 2023a, p. 123). Operating expenses which include selling expenses made up 31.9% of total costs before EBITDA, while administrative expenses accounted for the remaining 3.9% (H&M Group, 2023a). HMG aims to utilize their size to foster sustainable transition through investments *"That develop technologies and software that will lead the industry toward a*

circular and sustainable future" (H&M Group Ventures, n.d.), new retail and/or BMs, and tools that improve customer offerings. In 2022 2.7%, corresponding to €5,289.7 million of HMG's net sales, was used to invest. Through Crunchbase (n.d.) it is possible to see that eight out of the ten most recent investments were directed towards sustainability. However, when considering their largest investments, these consisted of Instabee (€624 million), Sheertex (€463 million), and Klarna (€401 million), out of which only: Sheertex is aimed at enhancing sustainability (H&M Group, 2023a).

Key partners

HMG's BM is built upon direct Channels; hence, HMG's products are exclusively sold via their own stores and websites. However, 6.5% of HMG's retail stores are facilitated through franchise takers who consequently make up a Key Partner (H&M Group, 2023a). Besides HMG's franchisees, they have recently forged new partnerships through coopetition, by allowing products from competing brands to be sold through H&M's app e.g., Good American and Dickies (H&M Group, 2023a; H&M App, n.d.). H&M Group controls large parts of their value chain and emphasizes that *"Our [HMG] value chain includes every step from idea to customer"* (H&M Group, 2022a, p. 6). However, HMG has outsourced production activities to external suppliers who make up their most important Key Partners, as their value chain is heavily dependent on them (Osterwalder & Pigneur, 2010; H&M Group, 2023a). Despite the company's effort to disclose information about suppliers; the exact amount remains unknown. According to HMG's annual report and published supplier spreadsheet, HMG has approximately 500-600 Tier 1 suppliers and 1,200 Tier 2 suppliers as of March 2023. However, according to their website HMG had closer to 950 tier 1 suppliers and almost 1,400 tier 2 factories, with China, Bangladesh, and Turkey being their biggest production markets (H&M Group, n.d.b.; H&M Group, 2023a).

In summary HMG's BM has the following composition:

<table>
<tr><th colspan="5">Business Model Canvas</th></tr>
<tr><th>Key Partners</th><th>Key Activities</th><th>Value Proposition</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr><td rowspan="3">Suppliers

Franchisees</td><td>Sales of clothing, accessories, footwear, cosmetics, home textiles and homeware</td><td rowspan="3">Make fashion and design accessible to everyone, by offering the best combination of fashion, quality, and sustainability at affordable prices</td><td>Accessibility: interaction in physical stores
Interaction through digital channels

H&M Member</td><td rowspan="3">Mass market (79 countries) → mostly women, but also men, teenagers, children, and babies</td></tr>
<tr><th>Key Resources</th><th>Channels</th></tr>
<tr><td>Physical retail Stores

Multiple brands

Efficient and demand driven supply chain management</td><td>Retail (68%)

Online (32%)</td></tr>
<tr><th colspan="2">Cost Structure</th><th colspan="3">Revenue Streams</th></tr>
<tr><td colspan="2">Costs of goods sold (64.2%)

Selling expenses (31.9%)

Administrative expenses (3.9%)</td><td colspan="3">Direct sales

Sales via franchise holders</td></tr>
</table>

Table 4 (Own contribution based on H&M 2023a; H&M 2022a; H&M Group, n.d.b; H&M, n.d.d; H&M Group Ventures, n.d.; H&M, n.d.d; Osterwalder & Pigneur, 2010)

7.2. Raw Material Extraction & Processing

Raw Material Extraction & Processing is the second phase of the Conceptual Framework. This phase looks into "*Cultivation and extraction of raw materials from the earth, plants and animals"* (Sadowski et al., 2021, 4). The initiatives that can be implemented during this stage and will therefore be evaluated, include Energy Autonomy, Green Procurement, Life Cycle Assessment, and Materials Substitution (Kalmykova et al., 2018; Juntunen and Martiskainen, 2021; Krishna et al., 2017). As Raw Materials Extraction and Processing in the Apparel Supply Chain typically reside outside of the focal firms' control, i.e., with suppliers in Tiers 3 & 4, the information related to these suppliers will create the basis for the following chapter (Sadowski et al., 2021).

7.2.1. Raw Material Extraction & Processing in Inditex

Inditex (2023a) states in their annual report of 2022 that they "*Are aware that progressing towards a circular economy model, innovating in new materials, production processes or the use and end of life of our products is key to tackling the effects of climate change and the scarcity of natural resources"* (p. 185). For this reason, Inditex is cooperating with universities, start-ups, and other companies to develop novel CE solutions to strengthen the overall industry (Inditex, 2023a). Meanwhile, Inditex is aware that their current BM and the way they source raw materials hold risks "*From the potential adverse environmental effects of the Group's value chain due to the discharge of undesirable or hazardous substances*" (Inditex, 2023a, p. 90). For this reason, the following section will uncover the Raw Materials sourced by Inditex and the subsequent processing of these materials in a CE perspective (Kalmykova et al., 2018).

Energy Autonomy

Inditex's Scope 3 emissions related to Raw Material Extraction & Processing will be used as a measure for Energy Autonomy, i.e., "*The ability of an energy system to be fully functional through its own local production*" (Juntunen and Martiskainen, 2021, p. 1). This distinction is made as Scope 3 emissions are evaluated as the best indicator to measure the energy productivity and possible waste from production that is located outside of the focal firm (Juntunen and Martiskainen, 2021; Deloitte, n.d.). Activities in this phase are typically placed with Tier 3 & 4 suppliers. Meanwhile, Inditex does not account for these in their reporting (Inditex, 2023a). It is known that they have respectively 1,729 Tier 1 and 8,271 Tier 2 suppliers. For this reason, it must be assumed that there are at least as many suppliers in Tiers 3 & 4 as the amount of suppliers tends to accumulate in further links (Sadowski et al, 2021; Sarker et al., 2019).

Inditex's Scope 3 Emissions that are associated with Raw Material Extraction & Processing include: 2,308 ktCO2eq Raw Material Extraction (13.4%), 2,170 ktCO2eq Raw Material Processing (12.6%), and 3,514 ktCO2eq Wet Processes (20.4%). These scope 3 emissions totals to 7,992 ktCO2eq corresponding to 46.4% of Inditex's total Scope 3 emissions in 2022 (Inditex, 2023a). Inditex's emissions related to Raw Material Extraction & Processing have reached the highest level since baseline year 2019, having increased 8.4 percentage points compared to 2021 and 6.8 percentage points in total since 2019 (Figure 8). This indicates that Inditex have not successfully implemented Energy Autonomy into their BM, as they have not

managed to reduce Scope 3 emissions related to these activities over a four-year period (Kalmykova et al., 2018). Therefore, their BM is assumed to be **not equipped** to implement CE through this activity (Kalmykova et al., 2018).

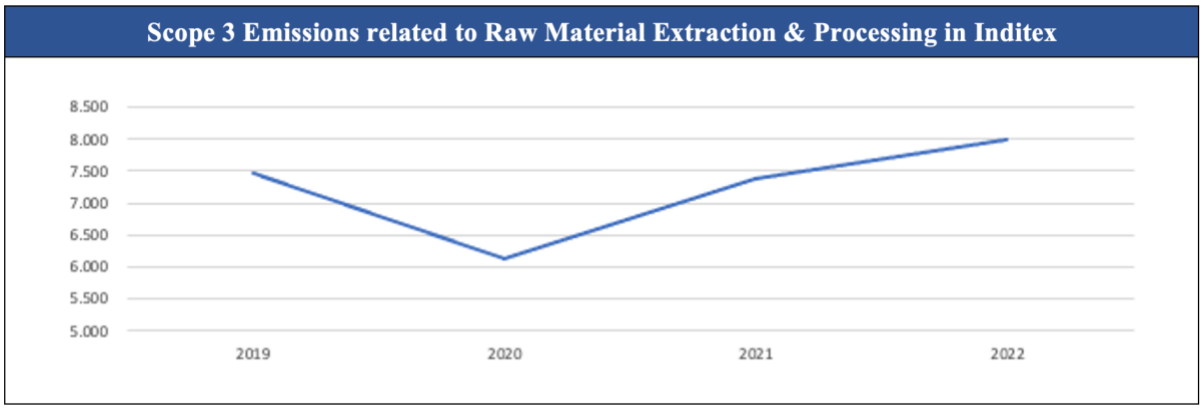

Figure 8 (Inditex 2023a, Inditex, 2022b; Inditex, 2021; Inditex, 2020)

This area is related to Inditex's Key Partners (Osterwalder & Pigneur, 2010). Inditex has regulations in place to make sure that "*All of our [Inditex's] suppliers and manufacturers are audited against our Code of Conduct for Manufacturers and Suppliers, which includes a section on environmental compliance*" (Inditex, 2023a, p. 353). Thus, Inditex requires suppliers in all tiers to live up to their environmental standards to ensure sustainability and CE throughout their value chain (Inditex, 2023a). Nonetheless, the massive number of suppliers that Inditex partners with may obstruct their goal, as more than 10,000 audits in 2022 revealed several breaches of their code of conduct (Inditex, 2023a). The lack of general compliance among suppliers cooperates research suggesting that complex and long chains involving many suppliers are associated with lower levels of governance, hence, a weakened ability to uphold CE standards and practices (Villena & Gioia, 2020).

Green Procurement & Life Cycle Assessment

Green Procurement is defined by Kalmykova et al. (2018) as, the process of choosing "*Goods and services with the same primary function but lower environmental impact as measured, for example, by LCA[Life Cycle Assessment]-based comparison of goods and services*" (p. 196). The concepts of Green Procurement & Life Cycle Assessments are closely related. In Inditex Green Procurement is measured in terms of Preferred Raw Materials extracted for production. Preferred is defined by Textile Exchange, a non-profit committed to driving positive change in the apparel industry by guiding companies on the use of preferred materials, "*As one which*

results in improved environmental and/or social sustainability outcomes and impacts in comparison to conventional production" (Textile Exchange, n.d.a). This distinction is made on the basis of e.g., Life Cycle Assessment. Thus, Green Procurement and Life Cycle Assessment initiatives are considered mutually dependent in this context (Korhonen et al., 2018; Kalmykova et al., 2018).

According to Inditex: "*We [Inditex] pay special attention to the raw materials we use in our products because of their relationship with biodiversity, water consumption or greenhouse gas emissions, among other considerations*" (Inditex, 2023a, p. 187). Their special attention to Raw Materials Extraction appears in the fact that almost 60% of their Raw Materials in 2022 were sourced from Preferred materials, i.e., fibers where "*No genetically modified seeds or synthetic fertilisers are used*" (Inditex, 2023a, p. 189). Inditex's biggest share of Preferred materials came from Preferred Cotton (37.8%), Man-Made Cellulosic Fibers (8.6%), and Polyester (8.3%). Inditex has set goals to source 78.8% of their Raw Material from Preferred sources by 2025. Meanwhile, there is no goal to reduce or replace the remaining 21.2% of Raw Material from conventional sources (Inditex, 2023a). Based on the following it is assumed that Inditex's current BM is **equipped** for the implementation of Green Procurement & Life Cycle Assessment to foster CE. Meanwhile, as they have neither reached full implementation of these practices nor do not have immediate goals to do so, this initiative cannot be considered fully implemented. Consequently, becoming fully circular will not require BMR, but rather a wind-down of procurement of non-preferred materials (Kalmykova et al., 2018).

Material Substitution

In 2022 Inditex's share of Recycled Raw Materials came from respectively 2.3% Cotton, 8.3% Polyester, and less than 0.1% Man-Made Cellulosic Fibers and Linen (Inditex, 2023a). Thus, the share of Recycled Raw Materials extracted by Inditex made up 10.6% of their total Raw Material use. The Recycled materials came from both pre- and post-consumers waste such as scrapes and returned garments (Inditex, 2023a). Inditex do not mention specific goals regarding the use of Recycled Raw Materials in their production. This is seen as a negative contribution to CE (Kalmykova et al., 2018). In sum, there is not enough consistent evidence to determine whether Inditex's current BM is equipped to implement Material Substitution as an activity to enforce circularity as the level of Materials Substitution is not considered substantial. The activity is therefore considered **inconclusive** (Kalmykova et al., 2018).

Raw Material Extraction & Processing in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Autonomy				
Green Procurement & LCA				
Material Substitution				
Overall assessment				

Table 5

Table 5 suggests that overall Inditex BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Raw Material Extraction and Processing.

7.2.2. Raw Material Extraction & Processing in H&M Group

HMG emphasizes that the industry "*Is heavily reliant on materials"* (H&M Group, 2023b, p. 43). Consequently, HMG works towards achieving a reverse supply chain, i.e., *"A system that brings used products, materials and production waste back into circulation either as second-hand products, or to be reused or recycled and diverted back into the production system"* (H&M Group, 2023b, p. 9). When assessing the company's Raw Materials Extraction & Processing, it is important to note that the company defines circular products as *"Products that are made to last from safe, recycled, regenerative or other more sustainably sourced materials"* (H&M Group, 2023b, p. 4). The following section will uncover the Raw Materials sourced by HMG and the subsequent processing of these materials (Kalmykova et al., 2018).

Energy Autonomy

As with Inditex, HMG's Scope 3 emissions will be used as a measure to Energy Autonomy as their Raw Materials are also extracted outside of HMG's own operations (H&M Group, 2022a). According to HMG *"Raw material production can cover tiers 4 to 6"* (H&M Group, n.d.b). Similar to Inditex, HMG does not account for these in their reporting, for which reason, it is assumed that there are at least as many suppliers in Tiers 3, 4, 5, and 6 as in earlier tiers as the amount of suppliers tends to accumulate (Sadowski et al, 2021; Sarker et al., 2019). HMG seeks to foster long-term relationships with their suppliers, and foster sustainability by

requiring all their suppliers to comply with their Sustainability Commitment and Code of Ethics (H&M Group, 2022a; H&M Group, 2023c).

In 2022 HMG's Scope 3 emissions, i.e. "*Other indirect GHG emissions*" (H&M Group, 2023b, p. 29) that could be associated with Raw Materials Extraction & Processing came from 690 ktCO2eq Raw Materials (9.6%) and 2,851 ktCO2eq Fabric Production (39.9%) corresponding to 49.5% of total Scope 3 emissions (H&M Group, 2023b). This represented a slight increase of 2.3 percentage points compared to 2021 but an overall decrease of 24.7 percentage points compared to baseline year 2019 (Figure 8). According to HMG (2023b), the overall positive development is caused by the increase in the share of recycled materials, energy-efficiency, and an increased use of renewable energy sources in these tiers. The arguments comply with Kalmykova et al. (2018) research suggesting that CE can be obtained by increasing the share of e.g., recycling. In sum, while the development related to Energy Autonomy has developed in an overall positive direction, the lack of a steady development in the last two years lead to an **inconclusive** result on whether their BM is equipped to implement Energy Autonomy (H&M Group, 2023b; Kalmykova et al. 2018).

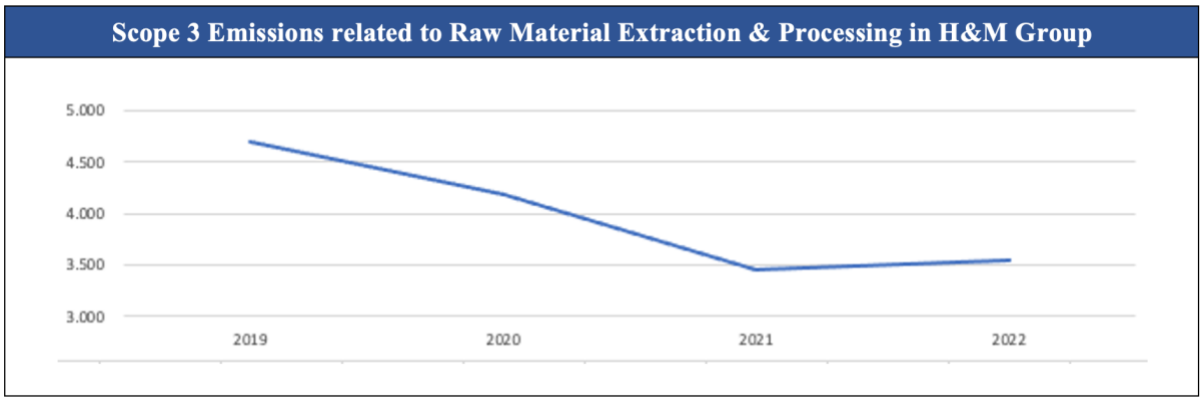

Figure 8 (H&M Group 2023b; H&M Group, 2022c; H&M Group 2021c; H&M Group, 2020)

As with Inditex, this area is related to Inditex's Key Partners (Osterwalder & Pigneur, 2010). Especially in the apparel industry, the endless tiers make it impossible to monitor what causes the environmental damage and waste (Sarker et al., 2019). This manifests in HMG's policies, where the requirements are limited to *"Make sure that our requirements on raw materials is being communicated to any sub-suppliers and subcontractors"* (H&M Group, 2022b), indicating that there is no direct contractual relationship between HMG and their lower tier suppliers.

Green Procurement & Life Cycle Assessment

In HMG, Green Procurement is defined as More Sustainably Sourced Materials, in which "*Suppliers have a reduced negative environmental impact compared to conventional alternatives"* (H&M Group, 2023b, p. 9). The assessment of these materials is based on a third-party Life Cycle Analysis, external benchmarks, and assessments. Thus, there is a basis for assuming that Green Procurement & Life Cycle Assessments are also linked in HMG's BM. 84% of HMG's Raw Materials were sourced from More Sustainably Sourced Materials in 2022 (H&M Group, 2023b). HMG's biggest share of Preferred materials came from Preferred Cotton (61%) and Polyester (15.5%). At the same time, HMG emphasizes that they have a goal to ensure that 100% of their materials are extracted from More Sustainably Sourced Material by 2030 (H&M Group, 2023b). In total, the current amount of 84% of Raw Materials being sourced from More Sustainably Sourced Materials and the goal to reach 100% in 2030 signals that HMG's BM is **equipped** to implement this CE initiative (Kalmykova et al., 2018; H&M Group, 2023b). However, the initiative cannot be considered fully implemented until 100% of the Raw Materials Extracted and Processed by HMG are aligned with Green Procurement & Life Cycle Assessment (Kalmykova et al., 2018). As with Inditex, becoming fully circular will not require a BMR, but rather a wind-down of the use of conventional materials.

Material Substitution

HMG's share of More Sustainably Sourced Materials from Recycled sources accounted for 23% of the company's overall use of Raw Materials. Cotton and Polyester had the biggest shares of recycled materials with respectively 6.7% and 15.5% (H&M Group, 2023a). The company emphasizes that *"Our [HMG] focus areas are scaling recycled and regenerative cotton"* (H&M Group, 2023b, p. 44). For this reason, HMG has an ambition to increase the overall level of Raw Materials extracted for Recycling to 30% by 2025 (H&M Group, 2023b). Considering that the current share of Recycled Raw Materials is relatively low and that the goal to increase Materials Substitution is limited, there is ultimately not considered enough evidence to state with certainty that HMG's BM is equipped to implement CE through Material Substitution, hence, the result regarding this initiative in considered **inconclusive** (Kalmykova et al., 2018).

Raw Material Extraction & Processing in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Autonomy				
Green Procurement & LCA				
Material Substitution				
Overall assessment				

Table 6

Table 6 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Raw Material Extraction and Processing.

7.3. Material Production & Finished Production Assembly

CE related to Material Production and Production Assembly deals with activities that usually reside with Tier 1 & 2 suppliers. In these stages Raw Materials extracted from earlier phases are processed and assembled into various garments such as tops, shirts, and jeans (Sadowski et al., 2021). According to Kalmykova et al. (2018), the solutions a company can implement during this stage to foster CE include: Energy Efficiency, Material Productivity, Agile Manufacturing, Customization & Made to Order, and Design for Disassembly & Recycling i.e., preparing products for Reuse or Recycling by using few different materials. The following sections will shed light on whether Inditex and H&M's BM are equipped for these activities.

7.3.1. Material Production & Finished Production Assembly in Inditex

In 2022 Material Production & Finished Production Assembly for Inditex took place at their 1,729 Tier 1 suppliers and 8,271 Tier 2 suppliers. The 1,729 Tier 1 suppliers were distributed throughout "*12 clusters in Spain, Portugal, Morocco, Türkiye, India, Bangladesh, Pakistan, Vietnam, China, Cambodia, Argentina and Brazil*" (Appx. 8). The biggest cluster was found in China with 404 suppliers followed by 201 suppliers in Turkey (Inditex 2023a; Sadowski et al., 2021).

Energy Effectiveness

Scope 3 emissions that could be associated with Material Production & Finished Production Assembly in Inditex in 2022 included: 2,205 ktCO2eq Material Production (12.8%), 758 ktCO2eq Finished Production Assembly (4.4%), and 1,447 ktCO2eq Upstream Transport & Distribution (8.4%), defined as transport *"Between a company's tier 1 suppliers"* (Barrow et al., 2013, p, 49). These Scope 3 emissions totals 4,409 ktCO2eq corresponding to 25.6% of all Scope 3 emissions in 2022 (Inditex, 2023a). This is a reduction of 9.8 percentage points since the previous fiscal year, and an overall reduction of 7.9 percentage points compared to baseline year 2019. Meanwhile, it is noted that the overall development has been unsteady from year to year, for which reason there is no evidence of a steady decrease representing Energy Effectiveness (Figure 9). Based on the above, Inditex's BM is assumed **not equipped** to implement Energy Effectiveness as a measure to obtain CE (Kalmykova et al., 2018).

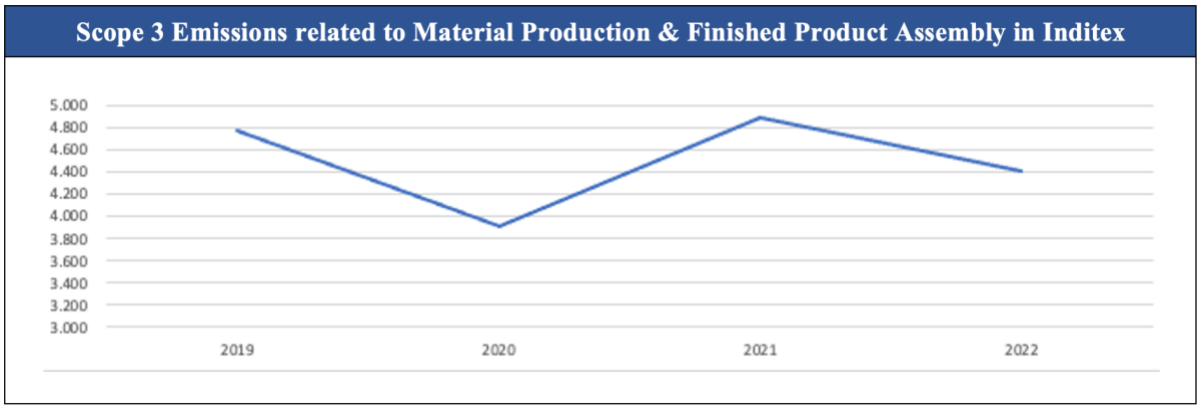

Figure 9 (Inditex 2023a, Inditex, 2022b; Inditex, 2021; Inditex, 2020)

Material Productivity

To obtain Materials Productivity, the value generated by each unit of input in Material production must be optimized (OECD, n.d.; Kalmykova et al., 2018). Wet processes are one of the biggest resources that go into Materials Production & Finished Production Assembly in the Fast fashion industry, for which reason this will be used as a measure for Material Productivity (Rauturier, 2022). Concurrently, Inditex reports that their "*Highest water consumption occurs in the production of goods*" (Inditex, 2023a, p. 207), which conforms with these results. Meanwhile, it is acknowledged that a considerable part of water usage is also related to the cultivation of Raw Materials & Processing (Rauturier, 2022). However, as it is not possible to differentiate the total water usage, it will be evaluated in this section alone.

The relative water consumption in 2022 was 77 cubic meters of water per tonnes to produce a kilo garment. This reflected a reduction of 12.5 percentage points compared to 2021, and 17.2 percentage points compared to 2020. Inditex's goal is to further reduce their relative water usage with 8% (Inditex, 2023a). In total there is considered convincing evidence that Inditex's BM is equipped for implementation of Materials Productivity related to water usage (Inditex, 2023a). Based on this, Inditex's current BM is assumed to be **equipped**. However, to fully implement Material Productivity, they would have to reduce their freshwater use to zero, hence, their use of water should stay within a closed loop by e.g., furthering collection of rain- and wastewater (Kalmykova et al. 2018). This can be done by investing in further Key Resources that enable water circulation. Additionally, to upscale this initiative in efforts to pursue full circularity, the company can look into their Key Partners, as the water is consumed in this link (Osterwalder & Pigneur, 2010).

Agile Manufacturing

To obtain Agile Manufacturing in the Material Production and Finished Production Assembly, a company would have to adopt *"A business-wide mindset characterised by a significant emphasis on routinely adaptable structures and infrastructures and enhanced access to global competencies as a means of achieving greater responsiveness to rapidly changing customer requirements.*" (Gunasekaran, 2019, p. 5154). Such practices include Agile & Lean. According to Inditex (2023a), they carry "*An agile and flexible supply chain, which allows us [Inditex] to respond to our customers' demands and meet the highest social and environmental standards*" (p. 214). Implementing Agile into their supply chain is aligned with Inditex's Key Activity related to producing the latest trends and avoiding excess production (Inditex, 2023a; Aftab et al., 2018). Accordingly, Inditex can bring a new trend from catwalk to store in as little as two weeks, which they are able to do by pre-committing only small portions of their materials in advance (Ozdil, 2020; Amed & Abnett, 2015). Based on the above, Inditex's BM is assumed to have **fully implemented** Agile Manufacturing, as it has incorporated flexibility to scale its production up and down in record time (Amed & Abnett, 2015; Kalmykova et al., 2018).

Customization & Made to Order

Offering Customization to customers in the design phase, can help "*Reduce waste and prevent over-production*" (Kalmykova et al., 2018, p. 196). While Inditex does not offer options for Customization in a traditional sense to their customers, they do utilize their Agile production to respond to customer feedback and make collections accordingly. This separates Inditex from

many other retailers, who have to buy in bulk, thus, commit to design before knowing how trends evolve (Amed & Abnett, 2015). Nonetheless, Inditex's Key Activity and Value Proposition ultimately reside on mass-production, which is not aligned with the principles of Customization, as Inditex's Material Production & Finished Production Assembly occurs upon forecasting and not specific orders from customers (Inditex, 2023a). Subsequently waste and over-production can only be minimized but not avoided completely. Based on the above, Inditex's current BM is assumed to be **not equipped** to implement Customization (Kalmykova et al., 2018).

Design for Disassembly & Recycling

Designing products for Disassembly & Recycling in Fast Fashion rely on the composition of Finished Products (Kalmykova et al., 2018; Simon, 2019). In this regard, a piece of garment made of few different materials is considered better than products made out of a mix of many materials. The best composition following Design for Disassembly & Recycling would therefore be garments made of only one type of Materials, as the resources needed to prepare this product for Reuse and Recycling are minimal (Simon, 2019; Kalmykova et al., 2018). An observation of 55 garments across Inditex's primary brand Zara's current collection and categories show an average materials composition per garment of 1.8 materials. Out of the garments 22 products were composed out of only one material, thus, in alignment with Design for Disassembly & Recycling (Appx. 10). Based on these results it is assumed that Inditex's BM is **equipped** to implement this initiative to obtain CE. However, they would need to adjust their material composition across their entire portfolio to one material per garment to reach full implementation of this initiative (Kalmykova et al., 2018). This adjustment could be carried out in cooperation with Inditex's Key Partners or Key Resources in terms of in-house designers (Osterwalder & Pigneur, 2010; Inditex, 2023a).

Material Production & Finished Product Assembly in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Material Productivity				
Agile Manufacturing				
Customization				
Design for Disassembly				
Overall assessment				

Table 7

Table 7 suggests that overall Inditex BM is **equipped** for CE implementation in regard to Material Production and Finished Product Assembly.

7.3.2. Material Production & Finished Production Assembly in H&M Group

HMG's Material Production & Finished Production Assembly were processed in 1,280 Tier 1 suppliers, and 960 Tier 2 suppliers spread across 36 countries (H&M Group, 2023a). The vast majority of the suppliers were located in Asia, with the biggest cluster being found in China with 356 suppliers, followed by Bangladesh with 138 suppliers (Appx. 9). HMG works towards increasing traceability in the supply chain by implementing blockchain technology and reporting about their Tier 1 & 2 suppliers (H&M Group, 2023c). HMG argues that "*Clear and transparent reporting is vital for creating accountability and monitoring performance*" (H&M Group, 2023b, p. 2).

Energy Effectiveness

In 2022 HMG's Scope 3 related to Material Production & Finished Product Assembly included: 585 ktCO2eq Other Expenditures (8%), 491 ktCO2eq Garment Manufacturing (7%), and 455 ktCO2eq Non-Garment Goods (7%). Non-Garment Goods are defined in alignment with the Greenhouse Gas Protocol as: "*Emissions from all purchased goods and services not otherwise included in the other categories*" (Barrow et al., 2013, p. 20). The Scope 3 emissions related to Material Production and Finished Product Assembly totaled 1,531 ktCO2eq corresponding to 21.6% of total Scope 3 emissions in HMG in 2022. This showed a reduction of 15.2 percentage

points since the previous fiscal year, and a total reduction of 16.5 percentage points compared to a 2019-baseline. However, the development experienced an increase in 2021 (Figure 10). In sum, while the development related to Energy Effectiveness has developed in an overall positive direction, the lack of a continuously steady development lead to an **inconclusive** result on whether their BM is equipped to implement this initiative (H&M Group, 2023b; Kalmykova et al. 2018).

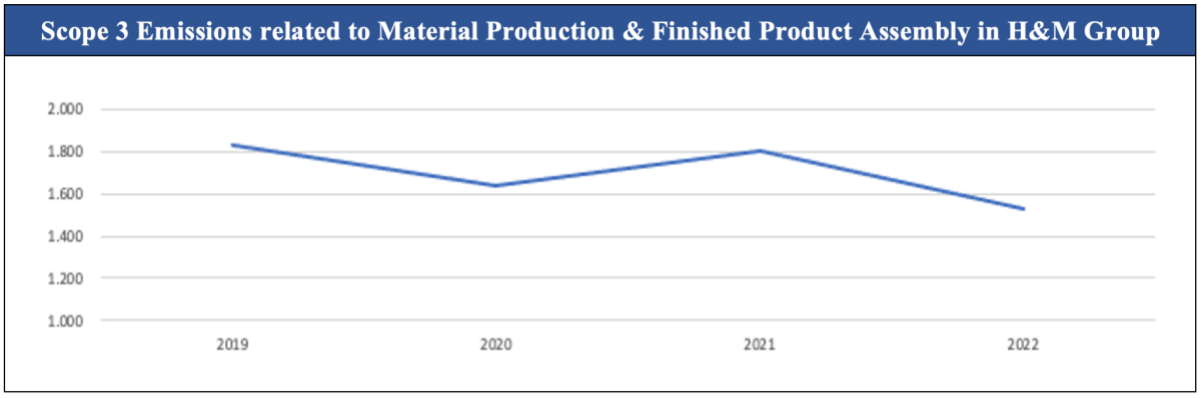

Figure 10 (H&M Group 2023b; H&M Group, 2022c; H&M Group 2021c; H&M Group, 2020)

Material Productivity

Relative water usage will again be used as a measure for Material Productivity (Rauturier, 2022). According to HMG (2023b) the relative water efficiency in 2022 amounted to 17 liters per unit of product, corresponding to a decrease of 15 percentage points compared to 2021 and 29.2 percentage points compared to 2017 (H&M Group, 2022c; H&M Group, 2023b). HMG (2023a) reports that the improvement is due to the achievement of 21% water recycling and 21% improvement in water efficiency (H&M Group, 2023a). In 2023 HMG launched a new Water Strategy for 2030, aiming to "*Reduce use, increase reuse and recycling for wastewater, reduce quantity and improve water quality*" (H&M Group, 2023a, p. 52). Their new targets shift away from water efficiency to absolute water reduction (H&M Group, n.d.b). In sum, this indicates that there is evidence that HMG's current BM is **equipped** to implement Material Productivity by reducing their relative water use in production (Osterwalder & Pigneur, 2010). They would need to reduce waste from their water use to zero, i.e., circulate this resource completely to obtain full implementation of this CE initiative (Kalmykova et al., 2018). As with Inditex, this can be done by investing in further Key Resources that enable water circulation. Additionally, to upscale this initiative in efforts to pursue full circularity, the

company can look into their Key Partners, as the water is consumed by suppliers (Osterwalder & Pigneur, 2010).

Agile Manufacturing

HMG states that "*Our [HMG's] sourcing strategy is flexible, and we are constantly evaluating the direct and indirect costs of each region to allocate our production in the most efficient way*" (H&M Group, 2023a, p. 104). HMG are constantly looking to adapt and adjust their supply chain related to Material Production, as this is a necessary pillar in the Fast Fashion industry, where trends, speed-to-market and prices are primary Value Propositions (Amed & Abnett, 2015). This reflects in the fact that "*Fashion industry is appropriately acknowledged as 'fast fashion' as it requires higher degree of flexibility, adaptability and response to production and decision making. Therefore, H&M integrates both lean and agile process of manufacturing to reap the maximum benefits out it*" (Rathore et al., 2019, p. 1558). Based on the above, there is reasonable proof that HMG, and the Fast fashion industry in general, are built on Agile Manufacturing Supply Chains (Osterwalder & Pigneur, 2010; Rathore et al., 2019). In sum, this leads to the conclusion that HMG has **fully implemented** Agile Manufacturing (Kalmykova et al., 2018).

Customization & Made to Order

HMG's production is based on mass-producing trend-based collections similar to Inditex. This means that they focus on bringing trends to stores as fast as possible to supply their customers in that order (H&M Group, 2022a). For this reason, they do not offer Customization of products nor production upon order (H&M Group, 2022a; Kalmykova et al. 2018). Following this approach cannot prevent waste and over-production, for which reason HMG's current BM is assessed **not equipped** to implement Customization & Made to Order to support circular transition (Kalmykova et al., 2018).

Design for Disassembly & Recycling

As mentioned earlier, a garment made of just one type of material is the optimal Design for Disassembly, as it requires less or no processing (Simon, 2019). An observation covering 55 garments across HMG's biggest brand H&M's current collection and categories showed that the average piece of garments was composed of 1.7 different types of materials, out of which 26 pieces were made out of a single material, hence, already aligned with Design for Disassembly & Recycling (Appx. 11; Kalmykova et al., 2018). Based on these results it is

assumed that HMG's BM is **equipped** to implement this initiative. Meanwhile, they would need to adjust their material composition across their entire portfolio to using just one material per piece of garments to have full implementation (Kalmykova et al., 2018). This adjustment could be carried out by changing the way products are designed through either Key Partners or Key Resources (Osterwalder & Pigneur, 2010).

Material Production & Finished Product Assembly in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Material Productivity				
Agile Manufacturing				
Customization				
Design for Disassembly				
Overall assessment				

Table 8

Table 8 suggests that overall HMG's BM is **equipped** for CE implementation in regard to Material Production and Finished Product Assembly.

7.4. Office, Retail & Distributions Centers

Office, Retail and Distribution Centers are typically controlled by the focal company in the typical Fast Fashion supply chains (Sadowski et al., 2021). This applies for both Inditex and HMG, for which reason internal measures will be used to assess this phase (Inditex 2023a; H&M Group, 2023a). Activities that can be implemented during this stage to foster CE includes Energy Effectiveness and Internal Waste Management (Kalmykova et al., 2018; Zero Waste, 2020). The following sections will shed light on the extent to which Inditex and HMG's BM are configured to obtain CE in regard to Office, Retail & Distributions Centers.

7.4.1. Office, Retail & Distributions Centers in Inditex

Inditex has set several goals to neutralize their environmental footprint related to activities in their Office, Retail and Distributions centers. These include reuse or recycling of all internally generated waste, reduction of water consumption at own operations, and 100% use of renewable energy in own facilities (Inditex, 2023a). Inditex describes that they "*Have a culture of environmental efficiency; in other words, we [Inditex] apply processes that enable us to control the consumption of resources and take measures to reduce that consumption so as to mitigate the impact thereof*" (Inditex, 2023a, p. 204). This is in line with Villena & Gioia's (2020) observations implying that centralized supply chain activities are easier to impact and control, hence, enforce CE practices in (Kalmykova et al., 2018).

Energy Effectiveness

As described in earlier sections Energy Effectiveness is related to the consumption and reduction of energy through processes that enable more efficient use of energy (Kalmykova et al., 2018). Inditex (2023a) declares in their Annual Report 2022 that managing and optimizing energy use is one of their main focuses. For this reason, Inditex has equipped their logistic platforms with "*Eco-efficient lighting systems, thermal insulation, and sophisticated temperature control systems*" (MAPFRE, n.d.), to ensure more resource efficiency in their offices. Additionally, they use bicycles and electric vehicles to get around their sites (MAPFRE, n.d.). When assessing the Effectiveness of Inditex's use of Energy following measures find relevance: Scope 1 & 2 emissions, and Scope 3 emissions related to Office, Retail, and Distribution (Deloitte, n.d.; Inditex, 2023a).

Inditex's Scope 1 emissions, which are "*Direct greenhouse gas emissions from sources owned or controlled by an organization*" (Deloitte, n.d.), amounted to 11 ktCO2eq. This corresponded to a reduction of 22.9 percentage points compared to 2021 and 28.9 percentage points compared to baseline 2019. Meanwhile, Scope 1 emissions reached the lowest point in 2020. However, this was as a consequence of Covid-19 forcing many Retail Stores to shut down in given periods rather than implementing Energy Effectiveness (Kalmykova et al., 2018). Inditex's goal is to reduce its scope 1 emissions by 90% compared to a 2018-baseline by 2030 (Inditex, 2023). In 2022 Inditex managed to transition to the use of 100% renewable electricity at their own facilities. This reflects in the fact that Scope 2 emissions, involving indirect emissions directed from energy purchased from 3rd parties, made up 0 tnCO2eq (Deloitte, n.d.; Inditex, 2023a;

Sotos, 2015). This result reflects a 100 percentage points decrease from 47,8 ktCO2eq in 2021 (Figure 11).

Lastly, Inditex's Scope 3 emissions relate to Office Retail & Distribution included: Other, Business Travels and Franchises (Inditex, 2023a). "*The "Other" category includes GHG emissions associated with the categories of capital goods, employee commuting, fuel and energy related activities, and waste generated in own operations*" (Inditex, 2023a, p. 199). These Scope 3 emissions totaled 1,137 ktCO2eq with Other being the most emitting category. The emissions from these categories represents an increase compared to the 2021 of 38.5 percentage points, and an overall increase of 26.4 percentage points compared to 2019 (Figure 11). In sum, Inditex's emissions from Scope 1, 2 & 3 related to Office, Distribution & Retail increased between 2019-2022. The result is caused by a significant increase in emissions related to Other and Business Travels that outweighs the positive development of Scope 1 & 2 emissions (Inditex, 2023a). Based on this Inditex's BM is evaluated **not equipped** for Energy Effectiveness in this link (Kalmykova et al., 2018)

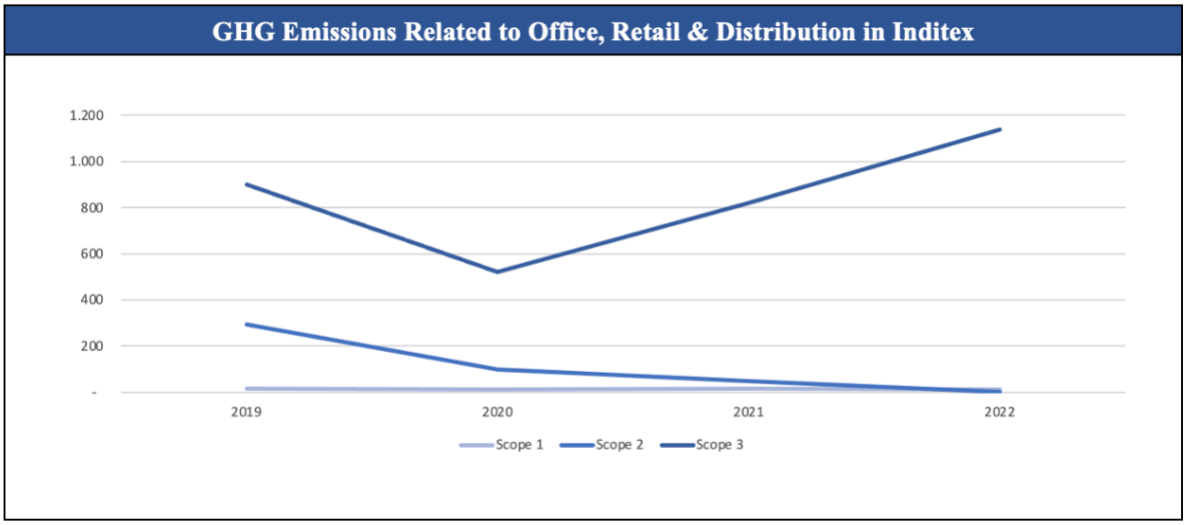

Figure 11 (Inditex 2023a, Inditex, 2022b; Inditex, 2021; Inditex, 2020)

Internal Waste Management

Internal Waste Management refers to the reduction of waste following initiatives such as waste-free packaging (Kalmykova et al., 2018; Simon, 2019). This phase considers the advancements of initiatives that reduce waste generated at own facilities in alignment with the first level of the Zero Waste Hierarchy by enforcing e.g., Reuse and Recycling (Simon, 2019). In 2022

Inditex generated 20.6 tonnes of waste at their own facilities which included their headquarters, logistic centers, own factories, and stores. The total amount of waste made up 1.2 percentage points more than in 2021 but had overall decreased 11.6 percentage points compared to baseline year 2019 (Inditex, 2023a).

Out of the waste generated in 2022, 1% was prepared for reuse, 90% was directed for recycling, and 9% was disposed of; out of which 1% had energy recovery (Inditex, 2023a). According to the Zero Waste Hierarchy the waste that was directed for reuse and recycling qualifies as waste with full recovery which is within the scope of Eco-Effective CE (Simon, 2019; Kalmykova et al., 2018). Meanwhile, the remaining 9% of waste that was disposed of is characterized as unacceptable according to Zero Waste (2020), hence, does not qualify as circular (Simon, 2019). Inditex is committed to circulating all their internally generated waste by 2023 through either reuse or recycling. This means Inditex must make full recovery of the remaining 9% from their facilities to fulfill their goal (Inditex, 2023a). Based on the above, it is assumed that Inditex's BM is **equipped** to enforce Internal Waste Management at their own facilities. They would have to make full recovery of the remaining 9% to consider this initiative fully implemented (Kalmykova et al., 2018). This can be done by committing further Key Resources to waste management (Osterwalder & Pigneur, 2010).

Office Retail & Distribution in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Internal Waste Management				
Overall assessment				

Table 9

Table 9 suggests that overall Inditex BM show **inconclusive** results on the BMs readiness for CE implementation regarding Office, Retail and Distribution.

7.4.2. Office, Retail & Distribution Centers in H&M

HMG works towards lowering emitting processes in their down-stream value chain, i.e., Their Offices, Retail, and Distribution Centers, by e.g., setting goals to lower the emissions related

to activities in these links. As part of their strategy for preferred fuel for transport, HMG "*Have purchased eco-fuel for a significant share of our [HMG's] ocean transports*" (H&M Group, 2022a, p. 32). According to HMG, their circular goals also is extended to their "*Stores, offices and distribution centres we use, though not all owned by us, [as they] are built, maintained and furnished in line with our circular and climate goals"* (H&M Group, 2023b, p. 58). Therefore, the company has defined a goal to reuse, repair or recycle 100% of the interiors in their office and stores by 2030 (H&M Group, 2023b).

Energy Effectiveness

When reaching targets for measures concerning energy, HMG have to focus on areas: Energy Efficiency, which includes minimizing energy throughout their entire value chain, and sourcing renewable energy (H&M Group, 2023b). In this regard, H&M Group has defined an ambition to *"Source 100%* renewable *electricity in our [HMG's] own operations"* (H&M Group, 2023b, p. 26) by 2030. To reach this goal HMG cooperates with partners, local stakeholders, and promotes policies related to renewable energy sourcing (H&M Group, 2023b). In efforts to reduce their energy use, HMG has implemented LED retrofit program in 72% of their stores (excluding China and Russia) and 75% of their offices - resulting in a 23% reduction in electricity intensity in their stores per square meter from a 2016 baseline (H&M Group, 2022b).

In 2022 HMG's emissions related to Office, Retail, and Distribution Centers included their Scope 1 & 2 emissions (Deloitte, n.d.), and following Scope 3 emissions: Transport, and Other which is defined by HMG (2023b) as "*Business travel, employee commuting, franchises, fuel- and energy-related activities, and waste generated in operations*" (p. 30). In 2022 HMG's emissions from Scope 1 made up 14 ktCO2eq. This corresponded to a steady reduction corresponding to 13.5 percentage points compared to 2021, and 18.5 percentage points compared to baseline year 2019. Scope 2 emissions in 2022 made up 47 ktCO2eq which correspond to an increase of 32.6 percentage points versus 2021 and a decrease of 3.9 percentage points compared to 2019. According to HMG, the stagnation in the last year is caused by the wind down of their current businesses in Russia and sourcing challenges in other markets which prevented the company from procuring renewable energy (H&M Group, 2023b)

Scope 3 emissions Related to Office, Retail & Distribution Center in 2022 came from Transport (331 ktCO2eq) and Other (155 ktCO2eq). In sum, these emissions amounted to 486 ktCO2 in 2022 which was a decrease of 7.8 percentage points compared to 2021, but an overall increase

of 103.2 percentage points compared to baseline year 2019 (H&M Group, 2023b). The massive increase is in part a reflection that HMG underwent changes to their reporting practices related to emissions in 2021 which meant the addition of Transport as a reporting category under Scope 3 (H&M Group, 2022c). For this reason, the Scope 3 emissions related to Transport are assumed to have been reported under other categories in 2019 and 2020, for which reason the increase is not necessarily a true reflection. In sum, HMG's total emissions related to Office, Retail & Distribution have decreased 8.0 percentage points compared to 2021 and increased 95.1 percentage points compared to baseline 2019 (Figure 12). Because of the uncertainties related to this increase it cannot be stated with certainty that HMG current BM is not equipped for implementation of Energy Effectiveness. On this background, the results are evaluated as **inconclusive** (Kalmykova et al., 2018).

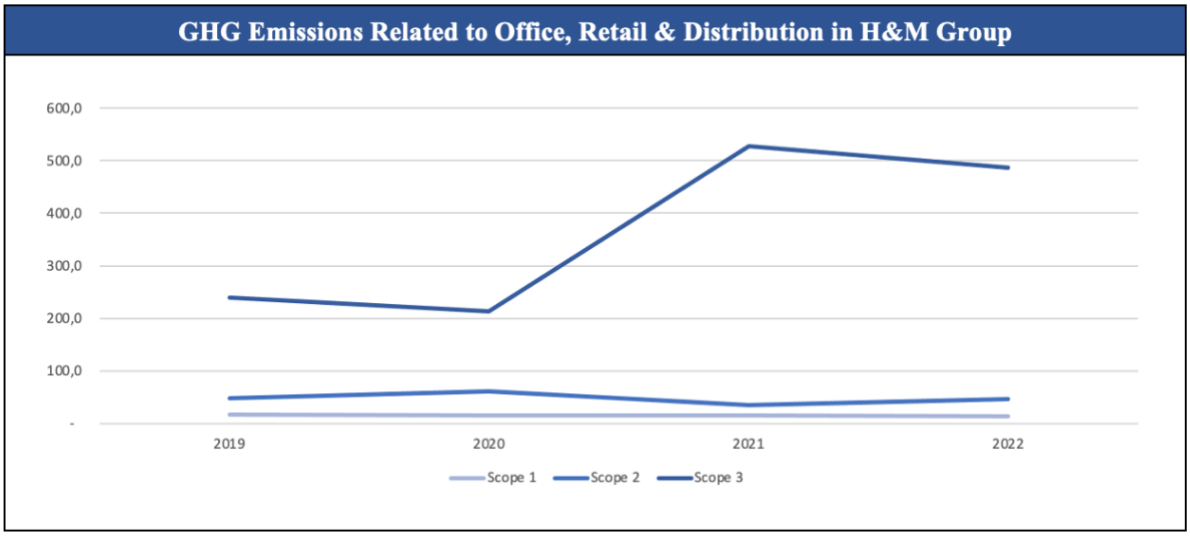

Figure 12 (H&M Group 2023b; H&M Group, 2022c; H&M Group 2021c; H&M Group, 2020)

Internal Waste Management

In efforts to pursue a CE, aligned with the Ellen MacArthur Foundation's (n.d.) definition of the term, HMG seeks to: *"Eliminate waste and pollution, circulate products and materials [...] and regenerate nature"* (H&M Group, 2023b, p. 56). To secure a more sustainable use of resources, with minimal use of natural resources and the lowest possible impact the company utilizes Artificial Intelligence and data throughout their entire supply chain. By ensuring that the right products are produced and sold at the right time and place, the company works towards avoiding overproduction, and minimizing the use of natural resources (H&M Group, 2022a).

Despite putting much effort into describing their waste management approach and efforts to reduce waste, the company fails to disclose any tangible measurements for waste management or goals for improvement (H&M Group, 2023b; H&M Group, 2023a). Nonetheless, HMG has set a goal to reach "*An absolute reduction in plastic packaging of 25% by 2025"* (H&M Group, 2023b, p. 56); goal that HMG has already reached. Further, the company aims to design 100% of their packaging to be reusable or recyclable by 2025, and "*Make 100% of packaging from recycled or other more sustainably sourced materials by 2030*" (H&M Group, 2023b, p. 56). The share of plastic that was reusable or recycled vis-á-vis made from recycled or other sustainable sources amounted to respectively 57% and 85% in 2022 (H&M Group, 2023b). Nonetheless, without any tangible measures the results concerning Internal Waste Management remain **inconclusive** (Kalmykova et al., 2018; Simon, 2019; Zero Waste, 2020).

Office Retail & Distribution in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Internal Waste Management				
Overall assessment				

Table 10

Table 10 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Office, Retail and Distribution.

7.5. Consumer Use

The goal with engaging in CE in this phase is to include the consumers and nurture a relationship in which the consumers become aware of how they can prolong the life of their products and motivate them to return them at a later stage (Sadowski et al., 2021). Activities in this phase that will be considered in the following section include Energy Effectiveness, Community Involvement, Product-labeling, Eco-labeling, and Virtualization (Kalmykova et al. 2018; United Nations Environment Programme, n.d.).

7.5.1. Consumer Use in Inditex

Inditex states in their Annual Report 2022 that they offer a BM that is centered around their customers. They try to nourish these relationships through both their physical and online Channels. The result in 2022 was that "*Our websites received more than 6,000 million visits, equating to more than 16 million daily visitors to the Group's online stores*" (Inditex, 2023a, p. 184). To foster sustainability in these relationships Inditex has previously been using Eco-labeling as a means to advance transparency in their retail links. Following section will uncover whether Inditex's current initiatives related to implementing CE in Consumer Use are effective.

Energy Effectiveness

In 2022 Inditex's Scope 3 emissions related to Consumer Use included: 224 ktCO2eq End-of-Life Treatment of Sold Products, and 3,462 ktCO2eq Use of Sold Products (Inditex, 2023a). According to the Greenhouse Gas Protocol, End-of-Life Treatment and Use of sold Products is defined as *"The total expected end-of-life emissions from all products sold in the reporting year"* (Borrow et al., 2013, p. 125), and *"The scope 1 and scope 2 emissions of end users"* (Borrow et al., 2013, p. 113). Scope 3 emissions totaled 3,686 ktCO2eq in 2022 corresponding to 21.4% of all Inditex's Scope 3 emissions that year (Inditex, 2023a). This was a reduction of 6.7 percentage points compared to the previous fiscal year and 18.4 percentage points compared to baseline year 2019 (Inditex, 2022b). The reduction is considered even more positive in the light that Inditex over the same period increased the amount of articles in tonnes placed on the market, signaling that their Energy Effectiveness related to Consumer Use is increasing (Kalmykova et al., 2018). In the meantime, Scope 3 emissions have not followed a steady decrease over the surveilled period. They actually reached a minimum in 2020 (Figure 13). Meanwhile, that same year Inditex placed 17.4% fewer articles on the market due to Covid-19 lockdowns affecting their sales. Therefore, it is considered that Inditex's BM is **equipped** to implement Energy Effectiveness in the Consumer Use phase, as they have shown ability to decrease emissions while increasing production. However, waste is still created in this link, for which reason the initiative cannot be considered fully implemented (Kalmykova et al., 2018).

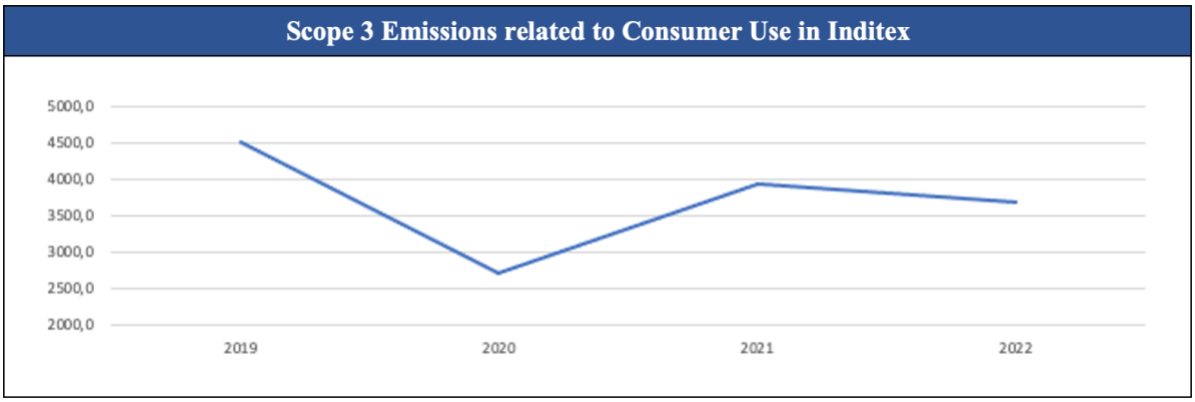

Figure 13 (Inditex 2023a, Inditex, 2022b; Inditex, 2021; Inditex, 2020)

Eco-Labeling

In 2015 Inditex introduced Join Life (Herrera, 2023), which is an Eco-label that "*Identifies the Group's products that use more sustainable raw materials and more environmentally friendly production processes*" (Inditex, 2023a, p. 182). In 2022 61% of the garments that Inditex's put on the market had the Join Life label. At the same time, Inditex announced that they would discontinue its use, with the argumentation that "*We [Inditex] have reached a point in the development of our strategy where it is no longer necessary to differentiate the products in our collections with this label*" (Inditex, 2023a, p. 187). In terms of implementing transparency and encourage circular behavior among their consumers, the discontinuation of the Eco-label is considered a step back in the transition towards CE considering that it will no longer be possible for Inditex's consumers to distinguish between products from more sustainable sources that are designed in a more sustainable way (Herrera, 2023). For this reason, Inditex's BM is now assessed as **not equipped** for CE implementation of Eco-labeling (Kalmykova et al., 2018).

Product-Labeling

Product-labeling enables consumers to make an informed purchase decision, by providing full information of the products placed on the market. This information specifies the raw materials, origin, and environmental benefit that underlies the products (Kalmykova et al., 2018; Simon, 2019). An observation of 20 labels across Inditex's biggest brand Zara's stores revealed that none of the labels provided sufficient Product-label information, as none of the required information was presented. Instead, a QR-code was fixed to the label, through which the relevant information could be accessed via a mobile device (Appx. 12). The online channels that the QR-codes lead to does disclose relevant Product-label data regarding raw materials and origin. Meanwhile, an observation of 55 product pages across Inditex's primary brand Zara,

reveal no information regarding environmental benefit (Appx. 10). At the same time, it is known from section 7.2.1. that 60% of Inditex's products are from Preferred sources, for which reason it is assumed that some of these products would include such materials, hence, have an environmental benefit (Inditex, 2023a). From a consumer point of view, knowing only in which country the raw materials originate from and which type of fabric is utilized does not allow for making an informed choice. Therefore, the results on whether Inditex's BM is ready for implementation of Product-labeling is assessed **inconclusive** (Kalmykova et al., 2018).

Community involvement

In 2021 Inditex launched an initiative called Changemakers that was meant to increase community- and voluntary involvement of different stakeholders related to product repair and replacement (Inditex, 2022b; Kalmykova et al., 2018). Changemakers is an initiative in which store employees are chosen and educated to be "*Ambassadors of our [Inditex's] sustainability culture and the Changemakers [...]. Changemakers ensure that sustainability reaches every corner of the Group and also compile suggestions and concerns about sustainability from our teams and customers*" (Inditex, 2023b, p. 129). In 2022 the initiative counted more than 1,800 changemakers, who had engaged and taught more than 33,000 people about sustainability initiatives such as Life Cycle Assessment of products (Inditex, 2022a).

As of 2022 the concept was rolled out in all Zara stores, and Inditex have ambitions to roll out the concept to their remaining brands and stores in 2023 (Inditex, 2023a). This initiative advances transparency in the retail link on how to prolong the life span of products which encourages CE (Kalmykova et al., 2018; Simon, 2019). The current extent of the project covers all the markets where Zara is present, and the further expansion to the remaining brands is an indication that Inditex's BM is **equipped** for CE implementation related to Community Involvement. Nonetheless, the initiative is not extended to Inditex's additional brand. Further, educating 33,000 people is not assessed as an exhausted amount, indicating that there is room for improvement as the initiative has not been fully implemented (Kalmykova et al., 2018). To further the extent of Community Involvement Inditex can look into their Customer Relationships and Channels (Osterwalder & Pigneur, 2010).

Virtualization

According to Kalmykova et al. (2018) CE can be fostered in accordance with an increased Virtualization as this decreases the need for office spaces and business travel, which concurrently limits behavior that can cause undesired waste (Kalmykova et al., 2018). According to Inditex, they seek to stimulate a seamless shopping experience in both their physical- and online stores (Inditex, n.d.a). At the same time, they seek to increase store productivity by increasing sales per store while simultaneously reducing the number of stores. This led to the divestment of 10% of their retail stores in 2022 compared to the previous fiscal year.

Nonetheless, it seems apparent that Inditex, with their approximately 6,000 stores as their Key Resource, have a global strategy in which physical presence has significant impact. It is acknowledged that Inditex have implemented initiatives to optimize Virtualization, but it cannot be evaluated on the basis of the realized goals whether this is to foster CE or if it's rather part of a strategy to slim down the business and improve net sales (Inditex, 2023a). Further, the current share of 22.5% online sales cannot be considered sufficient for the initiative to be implemented to the extent that it affects the environment positively. Thus, it is not possible to conclude on Inditex's BMs readiness for CE implementation, and the initiative is assessed **inconclusive** (Kalmykova et al., 2018).

Consumer Use in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Eco-labeling				
Product labeling				
Community Involvement				
Virtualization				
Overall assessment				

Table 11

Table 11 suggests that overall Inditex's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Consumer Use.

7.5.2. Consumer Use in H&M Group

HMG states that their consumers are their most significant stakeholder. Therefore, they assume to manage these Customer Relationships actively through engagement. In this regard, they launched: H&M Take Care through their brand H&M, in effort to engage consumers in the circular transition (Hendriksz, 2018). Furthermore, they engage in active use of labeling to encourage informed consumer decisions (H&M Group, 2023b, Appx. 13). The following section will assess whether and to what extent HMG's BM is equipped for the implementation of Consumer Use initiatives.

Energy Effectiveness

In 2022 HMG's Scope 3 emissions related to consumer use included: 92 ktCO2eq End-of-life Treatment of Sold Products and 1,442 ktCO2eq Use of Sold Products. These Scope 3 emissions totaled 1,534 ktCO2eq corresponding to 21.6% of all Scope 3 emissions in 2022 (H&M Group, 2023b). This showed a reduction of 7.4 percentage points compared to the previous fiscal year, but an increase of 37.4 percentage points compared to a 2019 baseline (Figure 14). Considering the four-year period HMG's current BM is not ready to implement CE following this initiative and is therefore assessed as **not equipped** (Kalmykova et al., 2018).

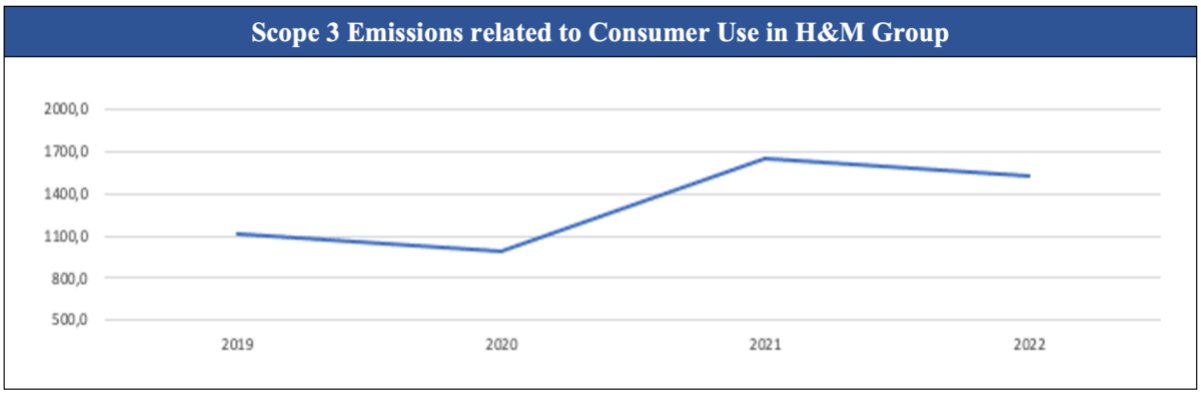

Figure 14 (H&M Group 2023b; H&M Group, 2022c; H&M Group 2021c; H&M Group, 2020)

Eco-labeling

In regard to Eco-labeling, HMG reports that they put a lot of emphasis on providing transparent data about their impact and products to their stakeholders, to enable them to make informed

decisions (H&M Group, 2023b). In 2010 HMG launched their first collection with Eco-labeling: Conscious, through their brand H&M (H&M Group, 2018). The Eco-labeling indicated that the product was made *"With at least 50% more sustainably sourced materials, such as certified organic cotton and recycled polyester."* (H&M Group, 2023b, p. 13). However, HMG recently withdrew their Conscious label due to immense criticism and accusations of greenwashing (Codiva, 2022; H&M Group, 2023b). Meanwhile, HMG assures that they will continue to provide additional information on the origin of the materials used in their garments. To do this, they have introduced a new Eco-label that is used to highlight the amount of sustainably sourced or recycled material that is used in a given product (H&M Group, 2023b).

An observation of 20 garments in an H&M store showed that 19 out of 20 observed products had an Eco-label attached (Appx. 13). The Eco-labels all had the same appearance but stated different levels of either recycled or other sustainably sourced materials, in either the shell, lining or both, e.g., *"Shell: 56% LivoEco Viscose. Lining: 100% Recycled polyester"* (Appx. 13 - example M). Nonetheless, in appearance the labels did not differentiate products that only contain 20% recycled materials in the shell only, from products with lower or higher concentrations (Appx. 13). In sum, the Eco-labeling initiative in HMG is considered a step forward in terms of increasing transparency, however, the labels can be perceived misleading from a consumer perspective as they use it for the majority of their product while also failing to distinguish between more or less sustainably sourced products. Further, it is worth mentioning that the use of the Eco-label only applies to their H&M brand (H&M Group, 2023b). Nonetheless, HMG has proven that their BM is **equipped** for CE implementation related to Eco-labeling, but due to the abovementioned flaws in the implementation, it cannot be assessed as fully implemented (Kalmykova et al., 2018).

Product-labeling

Considering the samples collected in H&Ms stores, it is not possible to obtain much information about the product. The product's that contain Eco-labeling only highlight the materials that are more sustainably sourced and does not reveal information on other materials. To obtain this information, consumers can instead look at the tag inside the linen of the garments or scan a QR-code that leads to a product page similar to what Inditex provided (Appx. 12; Appx. 13). An observation of 55 product pages on H&M's website disclosed information regarding which fabric the clothes are made of, including whether it is recycled,

and which supplier has produced the garment, including the exact name and address of the supplier (Appx. 11). Additional research shows that these initiatives are also extended to HMG's other brands (Monki, n.d.; Arket n.d.; & Other Stories n.d.; Weekday n.d.; COS, n.d.). As these initiatives provide consumers with the ability to make an informed choice, it is assessed that HMG has **fully implemented** Product Labeling (Kalmykova et al., 2018).

Community Involvement

HMG acknowledges that in order to become a company with net-zero climate impact and to drive positive change in the industry, they have to foster a better and more sustainable relationship between the consumers and Fast Fashion through Community Involvement. In 2018 HMG launched H&M Take Care through their brand H&M, in an effort to engage consumers in the circular transition (Hendriksz, 2018; H&M Group, 2023b). H&M Take Care consists of blog posts and is an extension of the brand's website, that *"Encourage[s] our customers to explore their style and increase the use of their clothes, offering inspiration on how to prolong the life of their garments through care and repair initiatives"* (H&M Group, 2023a). Today H&M Take Care is offered in all markets in which the company operates online (H&M Group, 2023b). The company's effort to provide guidance on product repair and replacement through their sharing platform is acknowledged. Nonetheless, as the company fails to measure the impact of their initiative, it is not possible to assess the company's BMs readiness for CE implementation, and the initiative related to Community Involvement is therefore assessed as **inconclusive** (Kalmykova et al., 2018).

Virtualization

HMG states that they carry an omni-channel strategy, with integrated channels in effort to facilitate a seamless customer journey. Consequently, they are highly focused on enhancing their online platforms and dedicate many resources hereto, to e.g., increase online traffic. However, they also emphasize that *"Customers clearly show that they appreciate our [HMG's] stores for proximity, availability and the opportunity to try on clothes"* (H&M Group, 2023a, p. 32). As stated in chapter 7.1.2.2. HMG's online stores are considered a compliment to their physical store rather than a Key Resource. However, 30% of the group's net sales derive from online sales, which is 7.5 percentage points more than Inditex, indicating that the company's effort to optimize Virtualization is somewhat more effective (H&M Group, 2023a; Inditex, 2023a). Nonetheless, the share of online sales, 30%, cannot be considered sufficient for the initiative to be implemented to the extent that it affects the environment positively. Thus, it is

not possible to conclude on Inditex's BMs readiness for CE implementation in regard to Virtualization, as a consequence the initiative is assessed **inconclusive** (Kalmykova et al., 2018).

Consumer Use in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Energy Effectiveness				
Eco-labeling				
Product labeling				
Community Involvement				
Virtualization				
Overall assessment				

Table 12

Table 12 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Consumer Use.

7.6. Return

Return characterizes the process in which a company takes back and recovers products from customers through various systems. This process can be benefitted by the use of incentives (Kalmykova et al., 2018). The return of products is significant as it helps companies control the life cycle of their products even after consumer use (Hilton et al., 2019; Appx. 4). According to Kalmykova et al. (2018) "*Customers who are satisfied with the products will return to the manufacturer to extend the service life of the products and keep their preferred features. Customer loyalty to the manufacturer is built in*" (p. 197). Thus, enforcing and achieving effective returns can become a competitive asset. When assessing the level of return in the respective case companies an assessment of how Effective their Take-back and Logistics Systems as well as Incentive for Return will be made (Kalmykova et al., 2021). This is followed by an assessment of Reuse, Repair, and Recycling initiatives, such as Design for Modularity and facilitates put in place for Upgrading, Maintenance & Repair (Kalmykova et al., 2018).

7.6.1. Return in Inditex

Effective Take-back and Logistics Systems

Effective Take-back and Logistics Systems are a direct indicator of Extended Producer Responsibility, as they refer to an *"An [efficient] initiative organized by a manufacturer or retailer; to collect used product or materials from consumers and reintroduce them to the original processing and manufacturing cycle"* (World Business Council for Sustainable Development, n.d.). Currently Inditex has implemented one Take-back System: Closing the Loop, which began in 2015. The program offers consumers the option to return their clothes *"Either through the containers located in our stores or by means of Zara.com's home collection services in Spain, the United Kingdom, New York, Paris, and various Chinese cities*" (Inditex, 2023a, p. 193). The clothes that are returned via this program are either reused, recycled, or donated to solidarity projects or people in need (Inditex, 2022a). In 2020 Closing the Loop was implemented in all markets and stores where local laws allowed it (Inditex, 2021), and in 2022 17,015 tonnes of garments were collected through the program (Inditex, 2023b). In addition to having introduced Closing the Loop, Inditex made a promise in 2021 to help set up five textile recycling hubs in Europe as part of the Business Council of the ReHubs initiative developed by Euratex (Inditex, 2023a). Euratex is an EU organization working to "*Set up an integrated system based on recycling hubs in Europe to upcycle textile waste"* (Rehubs, n.d.). Nonetheless, the European large-scale return-system centers have not been set up, and no timeframe has been specified for these efforts (Inditex, 2023a; Rehubs, n.d.).

When assessing the effectiveness of Inditex's Take-back Systems, it is relevant to look at the evolution of the initiative and the impact it has. Not considering 2020, where collection was compromised by the closed stores due to Covid-19, Inditex has managed to consistently increase their collection of garments by 3.5 - 5.9 percentage points every year since 2018, which indicates a progressive implementation of the initiative. However, the 17,015 tonnes of collected garments in 2022 only corresponded to 2.7% of Inditex's total garments production that year (Inditex, 2023a). Taking this into consideration, the impact of the initiative is not considered persuasive. Consequently, at this moment it cannot be assessed whether Inditex's BM is equipped for implementation of this initiative to foster CE, as it has not been either proven or falsified that their current BM can handle the necessary scale that would be required to reach an effective system (Appx. 6). Thus, it is concluded that the results on the BMs readiness for CE implementation is **inconclusive** (Kalmykova et al., 2018).

Incentive for Return

The primary incentives for Inditex's consumers to return their products for recycling relies on doing social good and enforcing an environmentally consciousness (Inditex, 2021). Thus, Inditex does not use any internal incentives such as discount codes or membership benefits to encourage their customers to return used garments (Inditex, 2023b). This aligns with Inditex's approach to Customer Relationship as accounted for under section 7.1.2.1 Nonetheless, it obstructs Inditex's ability to enforce Return, for which reason, their BM is assumed **not equipped** for CE implementation related to Incentive for Return (Kalmykova et al., 2018).

Return in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Effective Take-back Systems				
Incentive for Return				
Overall assessment				

Table 13

Table 13 suggests that overall Inditex's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Return. The score is given on an evaluation that Incentive for Return cannot be assessed as fully implemented, without fully implemented Effective Take-back and Logistics Systems. Moreover, it is assessed that the effect of Effective Take-back and Logistics Systems carry a greater impact for CE transition than Incentive for Return.

7.6.1.1. Reuse in Inditex

Direct secondary re-use

Reuse is considered the optimal approach to handle returned products following CE, as it requires no or minimal use of additional raw materials, energy, time, and cost (Mihelcic et al., 2003; Simon, 2019). Nonetheless, Inditex's efforts to introduce reuse into its value chain remains limited, as the organization's efforts to reuse covers only a small part of their production. Of the 17,015 tonnes of garment collected through their Closing the Loop program, just 10,719 tonnes were reused *"Either via donations to people who need them or by reselling to finance community projects"* (Inditex, 2023b). The share of reused garments in 2022 consequently accounted for 1.7% of their total production of garments placed on the market

(Inditex, 2023b). This result should be seen in the light that the option to return used products via containers has already been rolled out in all markets and stores where it is possible. Furthermore, home pickup of returns through delivery services is available in selected cities in 5 out of 94 markets (Inditex, 2023a). Based on the limited amount of clothes directed for secondary re-use, Inditex's BMs ability to handle direct secondary reuse seems implemented but has not been implemented to the necessary scale. Therefore, the initiative is assessed as **inconclusive** (Kalmykova et al., 2018).

Redistribute and Resell

Reuse in terms of redistributing and reselling refers to when a company facilitates opportunities for reselling and redistributing to extend a product's lifetime (Kalmykova et al., 2018). The option to Reuse by either donating or reselling clothes exists via the Zara Pre-Owned platform (Inditex, 2023a). The platform facilitates customer-to-customer sales by hosting a marketplace in which users can sell and buy used clothes from the primary brand Zara. Furthermore, customers can donate clothes to local NGO's by ordering a home pick-up or by returning the items in the designated Closing the Loop containers near Inditex's physical stores (Inditex, n.d.b). However, the Zara Pre-Owned platform is currently only available in the United Kingdom, making the extent of the initiative rather limited. Further, the effect and volume of the initiative has not been disclosed by Inditex. For this reason, the initiative cannot be used as an indicator for CE in this context. Consequently, the results on Inditex's BMs readiness for CE implementation in regard to this initiative is assessed **inconclusive** (Kalmykova et al., 2018).

Product-as-a-Service

Product-as-a-Service refers to an initiative by which the producer remains the owner who provides design, maintenance, repair, and recycling of the garments while the consumer rents the product for the time of usage (Kalmykova et al., 2018). As of 2022 Inditex does not offer any services related to Product-as-a-Service, nor have they expressed an ambition to do so (Inditex, 2023a). Consequently, it is assessed that Inditex's BM is currently **not equipped** for CE implementation of Product-as-a-Service (Kalmykova et al., 2018).

Reuse in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Direct secondary reuse				
Reuse through secondhand				
Product-as-a-Service				
Overall assessment				

Table 14

Table 14 suggests that overall Inditex's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Reuse.

7.6.1.2. Repair in Inditex

Upgrade, Maintenance & Repair

The only current option Inditex offers to Repair items is via the Zara Pre-Owned platform in the United Kingdom. The service is available in all UK stores and online (Inditex, 2023a). The price for the Repair Service is paid by the customers and ranges from €3.5- €17 for services that include new buttons, new zippers, hem adjustments, and various repairs (Inditex, n.d.b). In 2023 the platform *"Will reach new relevant markets, starting with France and Germany. Through this platform, we will continue helping our customers to extend the life cycle of their Zara garments*" (Inditex, 2023a, p. 92). Meanwhile, it remains unclear whether the concept has been adopted and used by customers (Inditex, 2023a). For this reason, it is not possible to draw any conclusion on Inditex's BMs readiness for CE implementation and the initiative is assessed as **inconclusive** (Kalmykova et al., 2018).

Repair in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Upgrading, Maintenance & Repair				
Overall assessment				

Table 15

Table 15 suggests that overall Inditex's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Repair.

7.6.1.3. Recycle/Dissemble in Inditex

Functional Recycling

Recycling is considered the least circular alternative between Reuse, Repair, and Recycling as it requires resources to dissemble the returned garments into secondary raw materials (McDonough & Braungart, 2002). Recycling refers to *"When the full function of a material is retained and utilized in next use*" (Diener & Tillman, 2015, p. 81). What distinguishes recycling in the Return phase from the Material Substitution in the Raw Material Extraction & Processing phase, is that the amount Recycled in this phase is contingent by the Return of the product. Whereas Material Substitution is concerned with replacing virgin material with recycled ones in general. Therefore, Functional Recycling only qualifies the amount of garment gathered and subsequently recycled by respectively Inditex or HMG (McDonough & Braungart, 2002; C&A, 2022).

As of 2022, Inditex collected 2.7% of their finished garment production via their current return systems. Out of this 1.7% were directed for Reuse, while *"The remaining 37% which, due to their characteristics or condition, could not be reused, was sent to recycling projects (most of them for downcycling) or, as a last resort, was used in energy recovery"* (Inditex, 2023b, p. 193). Hence, what corresponded to 1% of Inditex's production in 2022 was either recycled or used for energy recovery. Based on this it can be deduced that the 10.7% of Recycled Raw Materials that went into Inditex's production did not come from internally Returned and Recycled textiles. Instead, it must be assumed that Inditex sources their recycled raw materials from third-party textile producers (Inditex, 2023a). Nonetheless, the share of Functional Recycled materials remains insignificant. According to Inditex, part of the explanation for this is that "*Textile recycling is an industry-wide challenge. At present, both the available technologies and the existing capacities for collection and sorting of textile waste do not allow much of this waste to be recovered and repurposed*" (Inditex, 2023a, p. 186). While Inditex has implemented Functional Recycling, the share of recycled products from their own Return remains insignificant. On this foundation, the evidence on whether their BM is equipped for implementation is too small, for which reason, the initiative related to Functional Recycling is assessed **inconclusive** (Kalmykova et al., 2018).

Increasing By-product Use

As stated in the previous section, 37% of items returned via Closing the Loop that are not fit for Reuse are either downcycled or used for energy recovery, corresponding to 1% of Inditex's finished production in 2022 (Inditex, 2023a). Inditex fails to report the exact share of By-Products Use, as they do not distinguish between Functional Recycling, By-products Use, and Energy Recovery. Therefore, it can only be known that less than 1% of garment production was used to Increase By-products Use in 2022 (Kalmykova et al., 2018; Simon, 2019). Based on the above it is assumed that Inditex's BM is **not equipped** for CE implementation related to Increasing By-product Use (Kalmykova et al., 2018).

Recycle in Inditex				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Functional Recycling				
Increasing by-product use				
Overall assessment				

Table 16

Table 16 suggests that overall Inditex's BM is **inconclusive** for CE implementation regarding Recycle.

7.6.2. Return in H&M

Effective Take-back and Logistics Systems

In 2013 HMG launched their first garment collecting program through their biggest brand: H&M. The program was implemented by equipping H&M stores worldwide with recycling boxes. The program allows customers to hand in textiles with no requirements to the brand or condition of these (H&M, n.d.f.). Following the pilot in H&M, the program was extended to their existing brands. Each brand accepts different garments and textiles, except for COS, where HMG only allows returns of garments from their own brands (H&M Group, n.d.f). In 2022, a total amount of 14,768 tonnes of textiles, corresponding to 2.5% of HMG's production that year, was handed in through the program (H&M Group, 2023b; Paton & Maheshwari, 2019). Opposed to Inditex, the amount of garments collected has been continuously decreasing by 7-15 percentage points a year since 2019, and 35.2 percentage points in 2020 due to Covid-

19 shutdowns of stores (H&M Group, 2023b). While HMG have implemented an operationalizable Take-back and Logistics System, they have not proven that the initiative is effective as the quantity currently being collected is decreasing and remains small. Consequently, at this moment HMG's BM cannot be assessed as if it is equipped for CE implementation, as it is not proven that the current BM could handle the required scale up in returns to actually make an environmental difference. Thus, the initiative is assessed as **inconclusive** (Kalmykova et al., 2018).

Incentive for Return

When customers return their clothes through HMG's garment collection program, regardless of which brand or store, HMG provides a 10% voucher for the purchase of one new item per bag (H&M Group, n.d.f). Further, H&M offers a member's points program when consumers purchase products made of More Sustainably Sourced Materials or when choosing preferred transport. According to HMG, this is to incentivize the consumers to make a more informed choice (H&M Group, 2023b). This gives an indication that the HMG's BM is **equipped** for CE implementation of Incentive for Return (Kalmykova et al., 2018). Nonetheless, as argued in the previous paragraph, the quantity currently being collected is decreasing and remains small. Therefore, the initiative cannot be assessed as fully implemented.

Return in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Effective Take-back Systems				
Incentive for Return				
Overall assessment				

Table 17

Table 17 suggests that overall HMG's BM is **inconclusive** for CE implementation in regard to Return. The score is given on an evaluation that Incentive for Return cannot be assessed as fully implemented, without fully implemented Effective Take-back and Logistics Systems. Moreover, it is assessed that the effect of Effective Take-back and Logistics Systems carry a greater impact for CE transition than Incentive for Return.

7.6.2.1. Reuse in H&M Group

Direct Secondary Reuse

HMG considers investments in sustainability and recirculation activities as new business opportunities and have recently looked into different opportunities in regard to Reuse (H&M Group, 2023a). In 2022 HMG stated that 55% of the 14,768 tonnes of garment collected via takeback were "*Reused as a product"* (H&M Group, 2023b, p. 55). Hence, the amount of tonnes HMG reused from their own sources amounted to 8,122 tonnes accounting for 1.35% of their total amount produced in 2022. This share is considered too small to be considered significant (H&M Group, 2023a). Consequently, HMG's BMs ability to handle Direct Secondary Reuse is only proven to a limited extent and the initiatives related to direct secondary reuse is assessed **inconclusive** (Kalmykova et al., 2018).

Redistribute and Resell

HMG is experimenting with business opportunities within redistribution (H&M Group, n.d.e). In 2015 HMG invested in Sellpy; of which they had an owner-share of 70% in 2019 (H&M Group, 2019). Sellpy is a platform business, facilitated through a website and an app, where customers can buy and sell secondhand garments, or send the products directly to Recycling. According to HMG in 2022 *"More than eight million secondhand items were traded on the platform across 24 markets"* (H&M Group, 2023b, p. 54). The platform is marketed as the easiest way to resell, as Sellpy handles all the administration, as they even provide home collection services. Sellpy attempts to sell the garment over a 10-week period, and if they fail to sell the product, the garment is donated to charity (Sellpy, n.d.).

For sellers, Sellpy is only available in four markets, however, the offerings are available for buying in 24 different markets across Europe (H&M Group, n.d.e). In a limited number of markets, Sellpy is integrated on the brand: H&M's website (H&M Group, 2023b). The amount of transactions through Sellpy indicates that the initiative is successful. Thus, HMG's BM is assessed as **equipped** for CE implementation for Redistribute and Resell, though not successfully or fully implemented. In this regard it is noted that while HMG owns the majority; Sellpy remains an independent business, for which reason it cannot be considered fully implemented in HMG (Kalmykova et al., 2018). Furthermore, only consumers in four countries are currently able to resell through the app which indicates that full implementation of the initiative is not yet exploited (H&M Group, 2023b).

Product-as-a-Service

As a trial concept HMG launched their first Product-as-a-Service concept through the H&M brand in 2019. The concept allows H&M customers to rent clothes for seven days or longer in H&M's flagship store in Stockholm (H&M, 2019; H&M, n.d.g). HMG has ambitions to extend the service and emphasize that as of 2023 "*Selected H&M stores in Amsterdam, Berlin, London and Stockholm offer clothing rental services for specific collections"* (H&M Group, n.d.e). The rental service is extended to H&M Home offerings related to festive decorations, occasions, and celebrations in five undefined markets (H&M Group, n.d.e). HMG recently extended their rental service to Arket and & Other Stories. However, these rental services operate a bit differently, as they are hosted by external partners instead of in-house (H&M Group, 2021b; Arket, n.d.). Arket is run by Circos who rent out Arket children- and maternity clothes via a monthly prescription, whereas & Other Stories is offered through the rental platform Hurr Collective, which is only available in the UK (H&M Group, n.d.e). The initiatives related to Product-as-a-Service indicate that HMG's BM is equipped for CE implementation of this initiative. However, as the initiatives are only offered in a very limited number of markets, and the impact of the initiatives are not disclosed, the result on their BMs readiness for CE implementation remains **inconclusive** (Kalmykova et al., 2018).

Reuse in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Direct secondary reuse				
Reuse through secondhand				
Product-as-a-Service				
Overall assessment				

Table 18

Table 18 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Reuse.

7.6.2.2. Repair in H&M Group

Upgrade, Maintenance & Repair

HMG's repair options are limited; however, the company is working on increasing the availability. In 2022 they extended their Repair services linked to their H&M brand, which now includes H&M stores in seven cities (H&M Group, 2023b; H&M Group, n.d.e). Recently HMG launched the initiative Full Circle through their brand COS; aiming to repair and repurpose garments. Through Full Circle the company offers a collection of pre-worn COS products, that are collected, prepared and/or repaired for resale under a new label called Restore. In 2022 the initiative was launched in eight markets (H&M Group, 2023b; (H&M Group, n.d.e). However, as the Repair services initiatives are only offered in a very limited number of markets, and the impact of the initiatives are not disclosed, it is not possible to draw any conclusion on HMG's BMs readiness for CE implementation and the initiative is assessed as **inconclusive** (Kalmykova et al., 2018).

Repair in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Upgrading, Maintenance & Repair				
Overall assessment				

Table 19

Table 19 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Repair.

7.6.2.3. Recycle/Dissemble in H&M Group

Functional Recycling

HMG emphasizes that they seek to engage their suppliers, by building a strategic network of recyclers and by training their suppliers in waste management. By 2022 6.6% of their suppliers had participated in the waste management training focused on making waste recirculate in products (H&M Group, 2023b). The company seeks to increase the amount of recycled materials in their commercial goods from 23% in 2022 to 30% in 2025 (H&M Group, 2023b). For material to qualify as recycled, the material must be extracted from their own previous production (C&A, 2022; McDonough & Braungart, 2002). As earlier stated, the company

collected 14,768 tonnes of used products, whereas *"55% [were] reused as a product, [and] 15% [was] reused as material"* (H&M Group, 2023b, p. 55). Hence, out of the total 14,768 tonnes collected, the amount of tonnes HMG recycled from their own sources amounted to 2,215 tonnes corresponding to 0.4% of their total production in that year (H&M Group, 2023b).

HMG argues that their lack of recirculation and recycling is partly caused by the lack of infrastructure and a gap in scalable systems and technologies available in the industry. Despite the shift in the industry that has fostered innovation in recycled fibers, H&M claims that *"Commercial scale-up remains slow due to technology and financing gaps, and sometimes due to legislative barriers to resource recirculation"* (H&M Group, 2023b, p. 47). While H&M has implemented Functional Recycling, the share of recycled products from their own Return remains rather low, which is similar to what was observed in Inditex (2023a). On this foundation, the evidence on whether their BM is equipped for implementation is too small, for which reason, the initiative related to Functional Recycling is assessed **inconclusive** (Kalmykova et al., 2018).

Increasing By-product Use

HMG tries to Increase By-product Use through a waste of garment collection program. HMG disclosed in 2022 that 22% of the garment collected through this system was *"Recycled to become products for other industries"* (H&M Group, 2023b, p. 55). This indicates that HMG have implemented processes in their BM that equip them for CE implementation in terms of Increasing By-product Use. However, as this remains an even smaller share than Returned products for Functional Recycling, the result on their BMs readiness for CE implementation remains **inconclusive** (Kalmykova et al., 2018).

Recycle in H&M Group				
Initiative	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Functional Recycling				
Increasing by-product use				
Overall assessment				

Table 20

Table 20 suggests that overall HMG's BM show **inconclusive** results on the BMs readiness for CE implementation in regard to Recycle.

7.7 Overall Assessment of Circular Economy Implementation

Overall, the assessment of the case companies: Inditex & HMG reveal similar conclusions related to their ability to implement the CE initiatives found relevant under chapter 6 (Kalmykova et al., 2018). The concurring results strengthen the assumption that an analysis of the market leaders: Inditex and HMG, can be used to deduct general conclusions for the Fast Fashion industry (Hayes, 2022; Statista, 2023). The analysis of Inditex's and HMG's respective supply chains considering the Conceptual Framework reveal that only the second phase: Material Production & Finished Product Assembly is equipped for CE implementation, this advancement is highlighted as green in the visualization. The remaining phases: Raw Material Extraction & Processing, Office, Retail & Distribution, Consumer Use, Return and subsequent: Reuse, Repair, and Recycle are all assessed inconclusive, which results in a grey color code (Figure 15; Figure 16). Consequently, CE is not considered to be fully implemented in any parts of the companies' supply chains, for which reason, it is assumed that the Fast Fashion industry holds vast potential for further implementation of CE in all areas of the business. The opportunities for reconfiguring more circular BMs will be addressed in the following chapter 8.

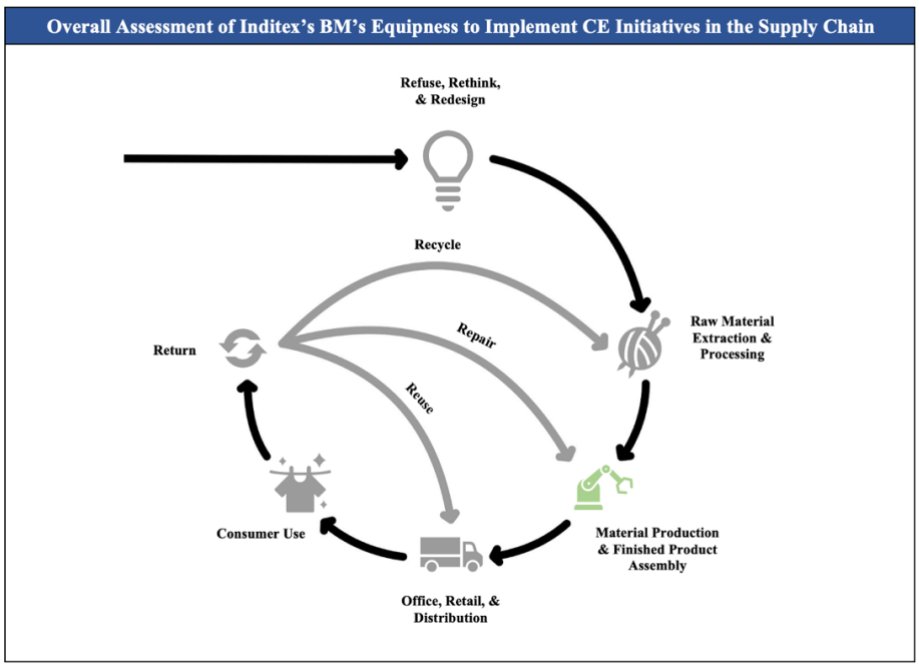

Figure 15

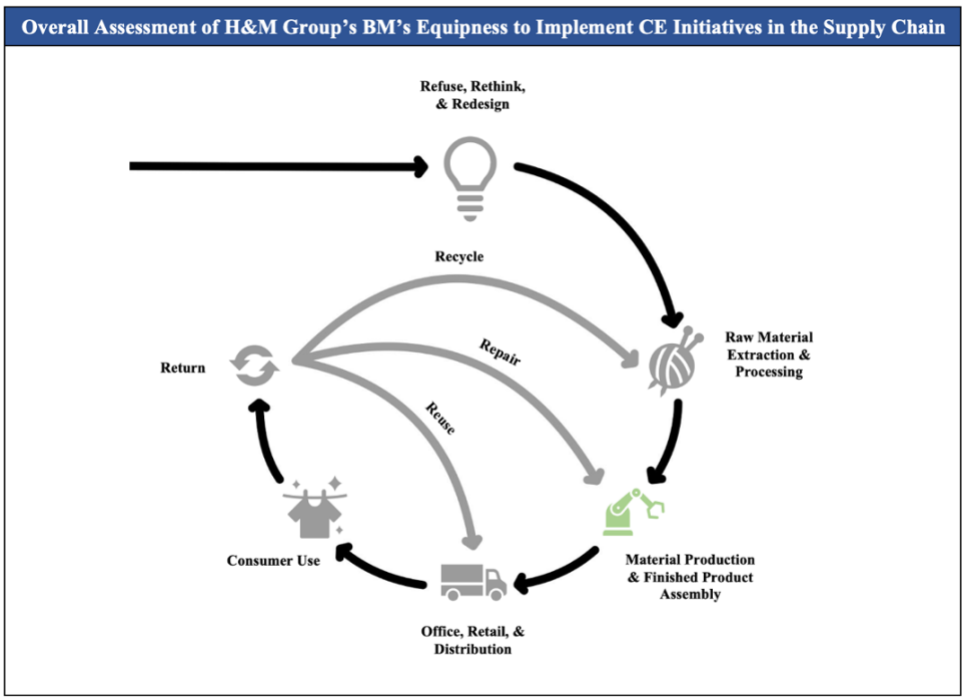

Figure 16

8. Refuse, Rethink & Redesign

The underlying solutions to prevent waste throughout the Fast Fashion Business Model (BM) relies on the ability to Rethink and Redesign BMs to be able to implement the previously presented Circular Economy (CE) initiatives (Osterwalder & Pigneur, 2010; Kalmykova et al., 2018). Thus, the following chapter will return to the first stage of this thesis' Conceptual Framework: Refuse, Rethink & Redesign, and discuss the opportunities for Business Model Reconfiguration (BMR) in relation to the initiatives that were assessed as not equipped or inconclusive under chapter 7 (Simon, 2019; Osterwalder & Pigneur, 2010).

According to Madumita Sadagopan, Associate Researcher at University of Borås and co-author of 'Circular economy - From review of theories and practices to development of implementation tools' (Kalmykova et al., 2018), the Fast Fashion industry is built on "*The obsoleteness of products (…) You have to jump to the next product, so this creates a waste*" (Appx. 4). With this Madumita Sadagopan questions whether an industry built around trends and fast lead-times can ever become circular. To build solutions that do not overwhelm incumbents and existing Fast Fashion companies, like Inditex and H&M Group (HMG), Kevin Shahbaz, from Board of Innovation and co-author of 'Circular Economy Business Models explained' (Board of Innovation, n.d.) suggests that "*You might try to be more strategic about*

which parts of your value chain, and what will have the most impact and work onwards" (Appx. 6). In relation, Leonardo Rosado, Associate Professor at Chalmers University and co-author of 'Circular economy - From review of theories and practices to development of implementation tools' (Kalmykova et al., 2018) emphasizes "*One of the big issues here is that Circular Economy requires a system thinking of the entire life cycle and value chain, and it is not enough to only consider what you have right in front of you*" (Appx. 5). In sum, the following sections will therefore discuss the potential of different BMR strategies to implement CE.

8.1. Raw Material Extraction & Processing

Overall, the analysis of Inditex and HMG's initiatives related to implementing CE in the Raw Material Extraction & Processing phase indicated that Fast Fashion BMs still show inconclusive results on their readiness for CE implementation, thereby leaving room for improvement (Table 21). The analysis reveals that Inditex and HMG both have BMs that are equipped to implement Green Procurement and Life Cycle Assessment. Meanwhile, they show the same lack of proven readiness in regard to Material Substitution. In terms of Energy Autonomy, the analysis concludes that HMG has been better than Inditex at reducing waste over a four-year period. Nonetheless, none of their BMs are equipped for CE implementation when it comes to this initiative. The areas in which the Fast Fashion BMs fall behind are thus Material Substitution and Energy Autonomy. Consequently, the areas in which the companies would have to undergo BMR are Key Partnerships and Cost Structure and inevitably also their Value Proposition (Osterwalder & Pigneur, 2010).

Overall Assessment of CE Initiatives in Raw Material Extraction & Processing				
Company	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Inditex				
H&M Group				

Table 21

To achieve CE in regard to Material Substitution and Energy Autonomy the case companies could undergo BMR in regard to their Key Partnerships. To do this, the companies can either seek to engage their lower tier suppliers to take part in Material Substitution by increasing the closed-loop circulation of products, thus, reduce the amount of products stemming from virgin

raw materials (Kalmykova et al., 2018). Another suggestion is to attempt to reduce their number of suppliers by focusing on the partnerships that are compliant with these initiatives. Due to the lack of direct contractual relationship, the first suggestion might be difficult to implement, as "*Lower-tier suppliers are also the least equipped to handle sustainability requirements"* (Villena & Gioia, 2020). Further, trying to engage lower tier suppliers in Material Substitution can be difficult if their technology is not ready to deliver the required scale. Harmens et al. (2021) emphasize that *"Recycling is technically complicated, energy-consuming and expensive [...] especially in combination with cheap virgin materials".* However, looking at this suggestion from a BM perspective, Kevin Shahbazi suggests that incremental changes to the BM, such as substituting virgin materials with recycled ones, is a relatively easy reconfiguration to the BM, as it contains less risk (Appx. 6). Thus, it is relevant to discuss the prospect of Materials Substitution of virgin raw materials.

All of the interviewees put emphasis on the trade-offs that is a prerequisite of CE. According to Simon (2019) Recycling is the least favorable option of the three CE initiatives. However, Madumita Sadagopan argues that when it comes to circularity, companies have to make the trade-off between the raw materials that are put into production and the durability of the finished product. Consequently, Madumita Sadagopan states that Fast Fashion garments could just as well be made of secondary raw material, which is usually associated with a loss of quality, as the products are not made to last for a long time (Appx. 4). The analysis revealed that both Inditex and HMG claim that the technology for Recycling is inadequate. Accordingly, Leonardo Rosado argues, in relation to Recycling, that *"When no one can or will deliver what you want them to you will have a hard time succeeding"* (Appx. 5). Even though Recycling is associated with a greater use of resources, Material Substitution will inevitably also affect Energy Autonomy positively as resources are saved on a systems level (Simon, 2019; Kalmykova et al., 2018).

There remain different opinions on how this will affect the BM in relation to Cost Structure. One on hand, Madumita Sadagopan suggests that Recycling material is much more expensive than using virgin raw material for which reason a larger extent of Material Substitution would result in added costs. Contrarily, Kevin Shahbaz describes this as a chicken-and-egg problem, "*Because you need to start with a high cost and then they lower as you scale"* (Appx. 6). Accordingly, he argues that *"The profitability of a recycling business model has to do with any kind of cost-saving from taking recycled material over a regular virgin material"* (Appx. 6).

Further, when asked about the prospects of circular BMs, Leonardo Rosado suggested that "*A lot of things become profitable just by saving resources*" (Appx. 6). Thus, there are conflicting perspectives on how Material Substitution would affect the Cost Structure. Nonetheless, it is assessed that scalability is a prerequisite for profitable Materials Substitution through Recycling (Osterwalder & Pigneur, 2010).

The latter suggestion, related to reducing the number of suppliers and instead focusing on partnerships that are compliant with Material Substitution, also holds potential as a strategy to increase the level of CE, as it decreases the risks related to enforcing CE implementation (Sarker et al., 2019). By decreasing the number of suppliers while simultaneously increasing the number of orders from each supplier the Cost Structure would likely be positively affected, as it allows for cost effectiveness (Appx. 6). Further, focusing on more sustainable suppliers and limiting transportation by placing fewer dispersed orders, could hold potential for a derivative positive effect on CE through Energy Autonomy (Kalmykova et al., 2018). Nonetheless, these suggestions lead up to a discussion of whether it is even possible to implement CE in a Fast Fashion Company, or if the risk of a BMR is too big relative to the potential reward. The problem arises as the industry is heavily reliant on their large number of suppliers, who ensure a short lead time that inevitably affects their Value Propositions that are built on adaptability to trends. That being the case, Kevin Shahbazi suggests *"That [their big need for supply, fast lead time and variability] is kind of the fundamental problem. The more circular they become - the weaker they will be I would say at their core business. And they are still not going to be fully circular either"* (Appx. 6). This manifests in the word: Fast that has been a built-in prerequisite for success for as long as the industry has existed, which makes it difficult to reconfigure and become circular, as *"Things should be slow to actually work towards circular metabolism"* (Appx. 6), according to Leonardo Rosado.

8.2. Material Production & Finished Product Assembly

The analysis reveals that Inditex and HMG show the same level of readiness in relation to CE implementation on the majority of the initiatives related to Material Production & Finished Production Assembly. Meanwhile, Inditex's ability to implement Energy Effectiveness in their BM is assessed as not equipped, while HMG have shown slight improvements during the observed period, however, resulting in inconclusive results. On the contrary, both case companies prove that their BMs are equipped for CE initiatives in relation to Material

Productivity and Designing for Disassembly (Table 22). Nonetheless, neither of the companies' BMs are equipped for Customization. In terms of performing BMR, the initiatives that neither of the case companies' BMs are equipped for: Energy Efficiency and Customization, are concerned with respectively the companies' Key Partners & Cost Structure and Key Activities & Value Proposition (Osterwalder & Pigneur, 2010).

Overall Assessment of CE Initiatives in Material Production & Finished Product Assembly				
Company	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Inditex				
H&M Group				

Table 22

As the Material Production & Finished Product Assembly are a part of Fast Fashion companies upstream supply chain and reside outside of their control, a BMR related to Energy Effectiveness would involve the companies' Key Partnerships. Energy Efficiency in this phase is concerned with Material Production, Finished Production Assembly and Upstream Transport & Distribution. According to Leonardo Rosado *"A lot of different things could be implemented such as sharing equipment instead of each company buying their own equipment [...] But the emphasis again, is the combination of all the initiatives"* (Appx. 5). Further, Leonardo Rosado argues that there are a lot of examples that showcase cost savings from reducing use, but that such require better structured BMs (Appx. 5). Nonetheless, as earlier argued, this will require either engagement from lower tier suppliers that are difficult to obtain due to the lack of contractual relationships, or a strategy focused on reducing the number of suppliers by focusing on partnerships that are compliant with the matter. The implications and limitations of these suggestions follow the same rationale as previously provided in section 8.1.

All of the interviewees put emphasis on the trade-offs that is a prerequisite of CE. Implementing CE through initiatives such as Customization that is said to prevent overproduction and inevitably reduce waste would require BMR in every part of their BM. Thus, from a risk- and reward point of view, implementing an initiative that would require a complete BMR contains a high level of risk and should not be attempted without very careful consideration (Massa & Tucci, 2013; Anossi et al., 2020). In fact, such BMR would arguably contribute to a radical

development within the Fast Fashion industry that would either move the company away from the market or initiate market changes (Osterwalder & Pigneur, 2010).

8.3. Office, Retail & Distribution Centers

The analysis of Inditex and HMG's initiatives related to implementing CE in their Office, Retail & Distribution Centers indicate that Fast Fashion BMs still show inconclusive results on its readiness for CE implementation (Table 23). For this reason, there is still room for improvement. The analysis revealed that HMG have made efforts to implement CE initiatives, nonetheless, their effort in relation to both Energy Effectiveness and Internal Waste Management remains inconclusive. Contrarily, Inditex BM is assessed as not equipped for implementation in relation to Energy Effectiveness and equipped for implementation in relation to Internal Waste Management, ultimately also assessing them as inconclusive overall. In terms of the initiatives that require BMR, it is assessed that they would impact the companies' Key partnerships, Key Resources, Channels and inevitably also their Value Proposition and Cost Structure (Osterwalder & Pigneur, 2010).

Overall Assessment of CE Initiatives in Office, Retail and Distribution				
Company	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Inditex				
H&M Group				

Table 23

In terms of Energy Effectiveness, the majority of the emissions led out by the case companies consists of Scope 3 emissions. The BMR required to implement CE in this area is therefore Key Partnerships. As earlier argued, this will require either engagement from lower tier suppliers that are difficult to obtain due to the lack of contractual relationships or attempt to reduce their number of suppliers by focusing on the partnerships that are compliant with the matter. The implications and limitations of these suggestions follow the same rationale as previously provided in section 9.2.

Implementing CE through Optimized Internal Waste Design requires a BMR in relation to Key Resources, facilitating internal processes to prevent- and recover waste (Kalmykova et al.,

2018; Simon, 2019; Zero Waste, 2020). Madumita Sadagopan suggests that a lot of waste is generated solely as a result of the unadvanced technology (Appx. 4). All the interviewees put emphasis on the Extended Producer Responsibility that is related to waste, and that a lot of waste in this area is not accounted for by the producers. Kevin Shahbazi suggests that the problem lies in the reverse logistics and adding value back to waste, that remains too costly (Appx. 6). On another note, Madumita Sadagopan argues that the solution should be found in policies, since waste remains unregulated. She introduced the possibility of Material- and Waste Passports to ensure that "*You can trace it back and you know what it is composed of. So, you can bring it back into your new production easily"* (Appx. 4). In this area systems thinking, and trade-offs also play a significant role, as Zero Waste goals to some extent contradict climate goals, since *"You are not able to recycle because you want to keep emissions intact or down, and you cannot have so much transportation"* (Appx. 4). Contrarily, Kevin Shahbazi emphasizes the importance of having ambitions towards circularity, as it paves the way for the progress, as long as they are long term (Appx. 6).

8.4. Consumer Use

Findings from the analysis of Inditex and HMG's initiatives related to implementing CE in Consumer Use indicate that there is room for improvement, as both companies are considered inconclusive in an overall assessment (Table 24). In regard to implementing Virtualization both companies receive inconclusive results. Meanwhile, Inditex's BM is assessed to be equipped for Energy Effectiveness and Community Involvement, while only HMG's BM is evaluated to be equipped for Eco-and Product-labeling. Hence, in this phase it appears that forces of one company's BM in relation to CE implementation is a disadvantage of the other and vice versa. In sum, this leads to ambiguous results for the general conclusions on the Fast Fashion industry's readiness to implement CE in the Consumer Use phase (Board of Innovation, n.d.). In sum, the areas in which the Fast Fashion BMs are unequipped relates to some degree to all initiatives related to implementing CE in Consumer Use. Consequently, the areas in which the companies would have to undergo BMR involve: Channels, Customer Relationships, Key Partners, Revenue Streams, Customer Segments, and Key Resources (Osterwalder & Pigneur, 2010).

Overall Assessment of CE Initiatives in Consumer Use				
Company	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Inditex				
H&M Group				

Table 24

Changes in Channels and Customer Relationship would affect the relationship with consumers as they represent direct customer touchpoints. The analysis reveals that in the Fast Fashion industry Channels primarily rest on retail stores and are supplemented by online environments (Osterwalder & Pigneur 2010; Sadowski et al., 2021). Adopting a greater use of online Channels could increase Virtualization, and help improve Energy Effectiveness, not only related to Consumer Use, but also Office, Retail & Distribution, as the need for physical stores would decrease (Kalmykova, et al., 2018). In regard to increasing Virtualization, Kevin Shahbazi, from Board of Innovation, focus on the fact that some Fast Fashion retailers, "*Like Zalando and Amazon, [...] perhaps they have the most interesting leverage point in this system rather than a company like H&M, whose main strength is the clothing they put out and the retail stores they have*" (Appx. 6). Thus, it can be argued that a change in Channels may consequently benefit the leverage point against Key Partners, such as suppliers, as fewer stores would decrease the production commitment and enforce a more Agile BM (Annossi et al., 2020). Nonetheless, as argued in section 6.1. the stores constitute one of both Inditex's and HMG's Key Resources and apply as one of the principal ways to interact with their customers to build Customer Relationships. Consequently, if choosing to Visualize, it is critical to uncover all of the trade-offs in relation to this initiative to be able to conduct an appropriate risk reward assessment (Osterwalder & Pigneur, 2010).

At the same time, it is argued that a system thinking approach must be adopted to increase the viability of such a strategy (Appx. 5). In this regard, Madumita Sadagopan states that "*I think it is important when you come from the clothing industry or textile industry you are so after the brands. So that is going after someone who is environmentally conscious, and who wants circular choices*" (Appx 4.). Following this logic, it can be discussed that in order to enforce CE in Consumer Use, Fast Fashion companies must also be critical of who they choose to pursue in their Customer Segmentation. This raises the question whether a broad mass market,

as pursued by both Inditex and HMG, can be viable when implementing CE, or whether focusing on a smaller but more conscious segment would be preferred (Inditex 2023a; H&M Group, n.d.a). On one hand, a broad mass market is currently the primary source for Revenue Streams, as this stems largely from one-time customer transactions. One the other hand, Kevin Shahbazi, argues that "*Maybe their margins would slowly shift to selling less, but more premium things*" (Appx. 6), which could concurrently help increase the profitability of the BMs in the longer run. At the same time, evidence from the United Nations Environment Programme (2022) indicates that the environmentally conscious segment is growing, for which reason, this strategy could hold substantial potential for growth.

Meanwhile, implementing a greater level of CE in the Consumer Use phase may prove difficult, if the Fast Fashion companies do not hold the adequate capacities or resources to e.g., apply Eco- and Product-labels to distinguish between what products are made from more sustainable materials versus products from conventional ones. Under this circumstance, they would have to undergo more radical BMR that also extended to their Key Partnerships and Key Resources, as they would have to invest in proper technology to report on a product level and implement a greater level of control in their upstream value chain to enhance reporting related thereto (Osterwalder & Pigneur 2010; Sadowski et al., 2021). Meanwhile, the implications and limitations of reconfiguring Key Partners follow the same rationale as previously accounted for in section 8.1.

8.5. Return - Reuse, Repair & Recycle

According to Madumita Sadagopan, "*Where I saw the challenge was in returning the waste to the manufacturer (...) there is a lot of waste that producers do not really account for. And in that case, it doesn't create that flow back into the manufacturing process*" (Appx. 4). Findings from the Fast Fashion industry conforms with this concern, as the BMs show inconclusive results on their readiness to implement CE through Return, and subsequently Reuse, Repair, and Recycle (Table 25). Consequently, the areas that are relevant to reconfigure to apply CE implementation are: Virtualization, Key Resources, Key Partners, Key Activities, Value Propositions, Cost Structure, and Revenue Streams (Osterwalder & Pigneur, 2010).

Overall Assessment of CE Initiatives in Material Production and Finished Product Assembly				
Company	**BM not equipped for CE initiative**	**Inconclusive results**	**BM equipped for CE initiative**	**Initiative fully implemented in BM**
Return				
Inditex				
H&M Group				
Reuse				
Inditex				
H&M Group				
Repair				
Inditex				
H&M Group				
Recycle				
Inditex				
H&M Group				

Table 25

The analysis reveals that both Fast Fashion companies have implemented Return systems that rely largely on drop-offs in their physical stores, and to some extent home pick-up services. Meanwhile, none of them have currently been able to scale the initiative for which reason it is considered inconclusive. According to Kevin Shahbazi "*You need to start with a high cost and then they lower as you scale. So e.g., cost of repair of clothing, or cost of returning and logistics*" (Appx. 6). Considering this, it can be discussed that the success within Return relies on the companies' ability to expand the initiative so that it becomes profitable. Several approaches thereto could be considered. On one hand, Fast Fashion companies could reconfigure their Value Propositions and Customer Relationships, to extend their home pickups services or return by shipments for clothes that consumers are done using, which would consequently increase the need for online Channels (Osterwalder & Pigneur, 2010). This BMR would enhance the need for logistics, distribution, and warehouse. In sum, this would require BMR of multiple components which would require large initial investments and therefore be

associated with greater risk (Massi & Tucci, 2013; Annosi et al., 2020). Alternatively, the companies could attempt to foster Return through external intermediates. This would only require a change in Key Partners and would consequently be associated with lower risk. On the other hand, this CE strategy could jeopardize control and compliance similar to suppliers in distant tiers, as Fast Fashion companies would not be able to directly control the Return process (Sadowski et al., 2021; Kalmykova et al., 2018).

As stated previously, the implementation of Reuse, Repair, and Recycling relies on the initial Return of products. Both case companies showcase inconclusive or unequipped results on all initiatives related to Reuse, Repair, and Recycling, except for HMG's ability to Reuse through Secondhand. According to Kevin Shahbazi, the explanation may be that "*It [inside the focal firm] is not the right environment to grow that type of innovation, and it should be done outside of the organization*" (Appx. 6). Based on this, the reason for the success of Reuse through Secondhand in HMG could be a reflection of the fact that the initiative is driven in a separate entity. This raises the discussions whether initiatives related to implementing CE would best be driven externally, either through Key Partners or separate entities which constitute a Key Resource (Osterwalder & Pigneur, 2010). The advantages of carrying out CE initiatives externally include that BMR would involve fewer components and therefore reduced risk. On the contrary, the advantages of carrying out CE initiatives internally include a greater level of control and a possibly profitable BM as a result of scaling. However, reconfiguring existing BMs to integrate Return, Reuse, Repair & Recycle would be associated with multiple BM changes affecting most, if not all, of the BM components (Osterwalder & Pigneur, 2010). In this event, the potential benefits of success and risk of failure are enormous. However, the potential benefits may offer Fast Fashion companies a competitive advantage that puts them ahead of the rest of the industry, hence, drives change rather than follow it (Annosi et al., 2020; Söderlund, 2010).

Meanwhile, as Kevin Shahbazi describes it: "*I can imagine that as technology evolves - the type of loops will also evolve (...) and especially in the biological loops*" (Appx. 6). Thus, there is still enormous room for technology advancement within this area, which means that implementing new initiatives for handling Return, Reuse, Repair & Recycle may fail. In this regard, all of the interviewees emphasize that technology to develop biodegradable garments may appear (Appx. 4; Appx. 5; Appx. 6). Such innovation would mean that the current initiatives related to: Return, Reuse, Repair & Recycle would become obsolete, as the

biological cycle does not rely on these phases (McDonough & Braungart, 2002). Under this event, major investments can turn out to be redundant, which poses a risk for Fast Fashion companies. The awareness of this risk may implicate structural- and cognitive barriers related to implementing significant BM changes in the organization and clashes in the organizational culture pertaining thereto (Massi & Tucci, 2013). This can in turn, create a state of inertia, as "*It is very hard sometimes if you want to test new initiatives, because you don't want to fail, because a lot of things depend on each other. And sometimes, when no one can or will deliver what you want them to you will have a hard time succeeding*" (Appx. 5) (Christensen et al., 2010).

Nonetheless, in the current business arena, governance has been the driver to foster sustainability and CE (Purvis et al., 2019; Vilella, 2020). In this regard, Rehubs (n.d.) states that "*By the end of 2024, Europe will face the challenge to compulsory separate the collection of textile waste"*. Thus, it can be expected that policies will increasingly focus on how to solve the environmental issues related to Fast Fashion, and therefore, this factor should weigh into decision-making for CE strategies (United Nations, 2015). As Kevin Shahbazi conveys "*There is obviously a role for policy to play. There would be an immediate effect if certain things are banned from the market or if there are certain things you need to hit*" (Appx. 6). Meanwhile, Korhonen et al. (2018) conveys that one of the limitations holding back CE implementation is Spatial and Temporal System Boundary Limitations that create a lack of a global body to govern CE implementation. Consequently, the risk of governance concerning this area may never be realized. Nonetheless, Leonardo Rosado argues that "*The risk is that, as soon as we solve our climate change problem, we need to solve the next one, and then the next one again, because that is only being reactive rather than proactive*" (Appx. 5). Thus, if Fast Fashion companies resists BMR into more circular BMs and follow a strategy of responding to market changes rather than leading them, then their BMs are in danger of failing in the market, which may not just lead to losses but potential BM failure (Annosi et al., 2020; Söderlund, 2010).

9. Conclusion

This thesis has investigated how *companies within the Fast Fashion Industry can redesign their Business Bodels to contribute to the Circular Economy.* To examine this research question Circular Economy and related concepts that best applied to the Fast Fashion Industry was accounted for. Through these concepts the thesis has determined what characterizes the Fast

Fashion Industry, as well as the current level of circularity in it. These findings have been used to determine what practices could be implemented to achieve a higher degree of CE in the industry, which subsequently leads to a discussion on what complications the industry could expect to encounter in that process.

To properly define what Circular Economy is, the School of Sustainable Development has been assessed as the most viable current solution, compared to other schools of thought to solve sustainability problems (Muraca & Schmelzer, 2017). Within this paradigm Circular Economy (CE) is used as the course of action, since it builds upon the recognition that the planet has a restricted capacity to digest pollution, and is therefore concentrated on eliminating waste, circulating products and materials, and regenerating nature (McDonough & Braungart, 2002; Kalmykova et al., 2018). This thesis takes the Eco-Effectiveness approach to CE, thus reducing waste by *"Minimizing the volume, velocity, and toxicity of the material flow system"* (Kalmykova et al., 2018 p. 195). The Eco-Effectiveness approach suggests that a systems thinking approach is needed to rethink business models (BM), to ensure that all waste is either Reduced, Reused, or Recycled, hence, all resources are kept in a tight loop where waste is either avoided or fully recovered (Vilella, 2020; Simon, 2019).

To apply the concepts to the Fast Fashion Industry, this thesis developed a Conceptual Framework based on a deduction of relevant theories within the subject and tested this on two case companies. The framework resulted in a visual roadmap that uses color coding to illustrate to what extent Fast Fashion companies' Business Models are equipped for Circular Economy implementation (Osterwalder & Pigneur, 2010). The assessment is based on the case companies' implementation of 23 initiatives presented by Kalmykova et al. (2018), and are ranging from not equipped (red), inconclusive assessment (grey), equipped (light green), fully equipped (dark green) (Board of Innovation, n.d.; Kalmykova et al., 2018). To apply systems thinking, the case companies' Circular Economy implementation is analyzed in every link of an industry specific supply chain reconstructed to complement a circular closed loop Business Models: Refuse, Rethink & Redesign of BM, Raw Material Extraction & Processing, Material Production & Finished Product Assembly, Consumer Use, and Return (Simon, 2019; Sadowski et al., 2021; McDonough & Braungart, 2002). Ultimately, this allows for a discussion of a risk-and-reward assessment in relation to the Business Model Reconfiguration required to implement CE (Osterwalder & Pigneur, 2010).

The Fast Fashion Industry is characterized by low prices that is achieved through short and dispersed value chains, fast lead time, and lower quality, that ultimately result in unresilient BMs and increased consumption and throw-away culture (Hayes, 2022; Terrell, 2012; Sadowski et al., 2021). Based on an assessment of CE implementation strategies, *the analysis of the current level of Circularity in the industry* overall shows inconclusive results on the case companies' BMs current ability to implement CE initiatives. Currently, the only supply chain link in which the companies prove that their BMs are equipped for CE implementation is Material Production & Finished Product Assembly. Thus, suggesting that the companies must perform several Business Model Reconfigurations in order to become circular (Kalmykova et al., 2018; Osterwalder & Pigneur, 2010).

The practices the Fast Fashion industry can implement to achieve a higher degree of Circular Economy make up the initiatives where the industry have shown unequipped- or inconclusive results on their ability to implement them. The analysis finds that the current Fast Fashion BMs are only equipped for implementation of five CE initiatives: Green Procurement & Life Cycle Assessment, Material Productivity, Agile Manufacturing, and Design for Disassembly. Thus, the remaining initiatives presented under the Conceptual Framework that can be implemented to achieve a higher degree of circularity include: Energy Autonomy, Material Substitution, Energy Effectiveness, Customization, Internal Waste Management, Eco-labeling, Product-labeling, Community involvement, Virtualization, Effective Take Back & Logistics Systems, Incentive for Return, Direct secondary Re-use, Reuse through Secondhand, Product-as-a-Service, Upgrading, Maintenance & Repair, Functional Recycling, and lastly Increasing by-Product Use (Kalmykova et al., 2018).

It is evaluated that implementing all these initiatives would affect all BM components and therefore require extensive BMRs. As risks appear to be proportionally associated with the extent of the BMR these are assessed to be substantial (Osterwalder & Pigneur, 2010; Massa & Tucci, 2013). *The complications that the Fast Fashion Industry might encounter when implementing more circular practices in their BMs* are mainly concerned with the risk that follows radical BMR These risks are assessed to include: structural- and cognitive barriers, failure due to technology advancement or pursuing of wrong strategies, uncertainty from a risk- and reward point of view, and ultimately the risk of failing in the industry due to inertia which may cause current BMs to be unviable in the long term (Osterwalder & Pigneur, 2010; Massa & Tucci, 2013; Christenen et al., 2010).

10. References

& Other Stories. (n.d.). *& Other Stories*. Retrieved April 3, 2023, from https://www.stories.com/en_dkk/index.html

Aftab, M. A., Yuanjian, Q., Kabir, N., & Barua, Z. (2018). Super Responsive Supply Chain: The Case of Spanish Fast Fashion Retailer Inditex-Zara. *International Journal of Business and Management*, *13*(5), 212.

Alvarez-Risco, A., Rosen, M. A., & Del-Aguila-Arcentales, S. (2022). *Towards a Circular Economy - Transdisciplinary Approach for Business*.

Amed, I., & Abnett, K. (2015). *Inditex: Agile Fashion Force*. BoF. Retrieved April 22, 2023, From https://www.businessoffashion.com/articles/sustainability/inditex-agile-fashion-force/

Annosi, M. C., Foss, N., & Martini, A. (2020). When Agile Harms Learning and Innovation: (and What Can Be Done About It). *California Management Review*, *63*(1), 61–80.

Arket. (n.d.). *Rent ARKET Children's Clothing for More Sustainable Kidswear - ARKET DK*. Retrieved April 14, 2023, from https://www.arket.com/en_dkk/about/design/children/how-to-rent.html

ARKET. (n.d.). *STARTSIDE*. Retrieved April 3, 2023, from https://www.arket.com/en_dkk/index.html

Arrigo, E. (2018). Customer relationships and supply chain management in the fast fashion industry. (2018). *Diverse Methods in Customer Relationship Marketing and Management* , 1–16.

Assent. (n.d.). *What Is the Waste Framework Directive? Assent*. Retrieved February 3, 2023, from https://www.assent.com/resources/knowledge-article/what-is-the-waste-framework-directive/

Barrow, M., Buckley, B., Caldicott, T., Cumberlege, T., Hsu, J., Kaufman, S., Ramm, K., Rich, D., & Temple-Smith, W. (2013). *Technical Guidance for Calculating Scope 3 Emissions (version 1.0)*

Board of Innovation. (n.d.). *Circular Economy Business Models explained*. Retrieved February 14, 2023, from https://www.boardofinnovation.com/circular-economy-business-models-explained/

Braungart, M. (2020). *The Cradle to Cradle Movement*. Columbia I SIPA Journal of Interna

tional Affairs. Retrieved February 3, 2023, from https://jia.sipa.columbia.edu/cradle-cradle-movement

Braungart, M., McDonough, W., & Bollinger, A. (2007). Cradle-to-cradle design: creating healthy emissions - a strategy for eco-effective product and system design. *Journal of Cleaner Production*, *15*(13–14), 1337–1348.

Bruce, M., Daly, L., & Towers, N. (2004). Lean or agile: A solution for supply chain man agement in the textiles and clothing industry? *International Journal of Operations and Production Management*, *24*(1–2), 151–170.

Business Coalition. (n.d.). *Business Coalition for a Global Plastics Treaty*. Retrieved March 30, 2023, from https://www.businessforplasticstreaty.org/

Business for Social Responsibility. (n.d.). *Sustainable Air Freight Alliance | Focus Areas | Sustainable Business Network and Consultancy | BSR*. Retrieved April 12, 2023, from https://www.bsr.org/en/collaboration/groups/sustainable-air-freight-alliance

C&A. (2022). *Cradle-to-Cradle - Producing without waste*. Retrieved February 3, 2023, from https://www.c-and-a.com/eu/en/shop/circular-economy-for-products

Camargo, L. R., Pereira, S. C. F., & Scarpin, M. R. S. (2020). Fast and ultra-fast fashion sup ply chain management: an exploratory research. *International Journal of Retail and Distribution Management*, *48*(6), 537–553.

Caradonna, J. L. (2017). An Incompatible couple: a critical history of economic growth and sustainable development. *History of the Future of Economic Growth* , 154–173.

Christensen, C. M., Kaufman, S. P., & Shih, W. C. (2010). *Innovation Killers : How Finan cial Tools Destroy Your Capacity to Do New Things*. Harvard Business Press. Retrieved April 15, 2023, from https://hbr.org/2008/01/innovation-killers-how-financial-tools-destroy-your-capacity-to-do-new-things

Christensen, D. M., Serafeim, G., & Sikochi, A. (2022). Why is Corporate Virtue in the Eye of The Beholder? The Case of ESG Ratings. *Accounting Review*, *97*(1), 147–175.

Codiva, M. (2022, June 30). *H&M Published and Removed Higg Index Environmental Score card After Quartz Called It Out for Misleading Data*. The Science Times. Retrieved April 15, 2023, from https://www.sciencetimes.com/articles/38478/20220630/h-m-published-opposite-result-higg-index-environmental-scorecard-quartz.htm

Cornejo, J. (2023). When Does Zara's Winter Sale Start. *Wear Next*. Retrieved April 17,

2023, from https://wear-next.com/news/when-does-zara-winter-sale-start/

Corona, B., Shen, L., Reike, D., Rosales Carreón, J., & Worrell, E. (2019). Towards sustaina ble development through the circular economy—A review and critical assessment on current circularity metrics. *Resources, Conservation and Recycling*, *151*. Retrieved February 5, 2023, from https://doi.org/10.1016/J.RESCONREC.2019.104498

COS. (n.d.). *COS*. Retrieved April 3, 2023, from https://www.cos.com/en_dkk/in dex.html?gclid=Cj0KCQjw8qmhBhClARIsANAtbodKwjJ9eQjjOCBoiKIz3qNlAkiCVy cW-aTT8A7kNYFIN6zYB0w5kwoaAgJAEALw_wcB

COS Resell. (n.d.). *Buy - COS Resell*. Retrieved April 14, 2023, from https://www.cosresell.com/buy

Crocker, R., Saint, C., Chen, G., & Tong, Y. (2018). *Unmaking Waste in Production and Consumption - Towards the Circular Economy*. Retrieved February 7, 2023, from https://ebookcentral-proquest-com.esc-web.lib.cbs.dk/lib/kbhnhh-ebooks/reader.action?docID=4826807

DEFRA. (2011). *Guidance on applying the Waste Hierarchy*. Retrieved February 5, 2023, from www.defra.gov.uk

Deloitte. (n.d.). *What are scope 1, 2 and 3 emissions? | Deloitte UK*. Retrieved April 23, 2023, from https://www2.deloitte.com/uk/en/focus/climate-change/zero-in-on-scope-1-2-and-3-emissions.html

Diener, D. L., & Tillman, A. M. (2015). Component end-of-life management: Exploring op portunities and related benefits of remanufacturing and functional recycling. *Resources, Conservation and Recycling*, *102*, 80–93.

Dimensions. (2023). *Timeline - Overview for Sustainability in Publications*. Retrieved April 5, 2023, from https://app.dimensions.ai/analytics/publication/overview/timeline?search_mode=content &search_text=sustainability&search_type=kws&search_field=full_search&year_from= 1974&year_to=2023

Ellen MacArthur Foundation. (n.d.). *Circular economy principles: Eliminate waste and pol lution*. Retrieved April 29, 2023, from https://ellenmacarthurfoundation.org/eliminate-waste-and-pollution

Enel Green Power. (n.d.). *The Circular Economy*. Retrieved May 2, 2023, from

https://www.enelgreenpower.com/learning-hub/sustainable-development/circular-economy

EPEA. (n.d.). *Cradle to Cradle - Rethinking Products*. Retrieved February 8, 2023, from https://epea.com/en/about-us/cradle-to-cradle

European Commission. (2021). *Understanding Product Environmental Footprint and Organ isation Environmental Footprint methods*. Retrieved February 16, 2023, https://publications.jrc.ec.europa.eu/repository/handle/JRC129907

European Commission. (2023). *Waste Framework Directive*. Retrieved February 15, 2023, fromhttps://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

European Parliament. (2020). *What if fashion were good for the planet?* Retrieved April 2, 2023, from http://www.europarl.europa.eu/thinktank

European Parliament. (2022). *The impact of textile production and waste on the environment (infographic) | News | European Parliament*. European Parliament News. Retrieved February 8, 2023, from https://www.europarl.europa.eu/news/en/headlines/society/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographic

European Union. (n.d.). *I:CO - a global waste collection network for textiles* . Retrieved April 19, 2023, from https://circulareconomy.europa.eu/platform/en/good-practices/ico-global-waste-collection-network-textiles

European Union. (2018). *DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance)*. Retrieved February 8, 2023, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

Eyring, V., Gillett, N. P., Achuta Rao, K. M., Barimalala South Africa, R., Barreiro, M., Bock, L., Malinina, E., Ruiz, L., Sallée, J.-B., Santer, B. D., Trewin, B., Weigel, K., Zhang, X., Zhao, A., Halenka, T., Marengo Orsini Brazil, J. A., Mitchell, D., Gillett, N., Achuta Rao, K., … Zhou, B. (2021). *Human Influence on the Climate System*. 423–552. Retrieved February 12, 2023, from https://doi.org/10.1017/9781009157896.005

Farmbrough, H. (2019). *Don't Buy, Rent - Why H&M Is Hiring Out Fashion*. Retrieved April

20, 2023, from https://www.forbes.com/sites/heatherfarmbrough/2019/11/26/dont-buy-rentwhy-hm-is-hiring-out-fashion/?sh=721aadc26795

Green, D. (2020). *Cradle to Cradle, Life Cycle Assessment and Circular Economy: A love tri angle - NZ Manufacturer*. Retrieved February 6, 2023, from https://nzmanufacturer.co.nz/2020/04/cradle-to-cradle-life-cycle-assessment-and-circular-economy-a-love-triangle/

Gunasekaran, A., Yusuf, Y., Adeleye, E., Papadopolus, T., Kovvuri, D., & Geyi, D. (2019). Agile manufacturing: an evolutionary review of practices.: EBSCOhost. *International Journal of Production Research*, *57*, 5154–5174.

Hansmann, R., Mieg, H. A., & Frischknecht, P. (2012). Principal sustainability components: Empirical analysis of synergies between the three pillars of sustainability. *International Journal of Sustainable Development and World Ecology*, *19*(5), 451–459.

Havard Library. (n.d.). *Oxford English Dictionary*. Retrieved February 3, 2023, from https://library.harvard.edu/services-tools/oxford-english-dictionary

Hayes, A. (2022). *Fast Fashion Explained and How It Impacts Retail Manufacturing*. In vestopedia. Retrieved February 24, 2023, from https://www.investopedia.com/terms/f/fast-fashion.asp

Hendriksz, V. (2018, April 16). H&M launches “Take Care” apparel pilot in Hamburg. *Fash ion United*. Retrieved April 10, 2023, from https://fashionunited.uk/news/fashion/h-m-launches-take-care-apparel-pilot-in-hamburg/2018041629128

Herrmann, C., Blume, S., Kurle, D., Schmidt, C., & Thiede, S. (2015). The positive impact factory - Transition from eco-efficiency to eco-effectiveness strategies in manufacturing. *Procedia CIRP*, *29*, 19–27.

Higg. (n.d.). *Understand the FEM Results – User Resources: How To Higg*. Higg. Retrieved April 12, 2023, from https://howtohigg.org/fem-user-selection/fem-facility-users-landing/understand-the-fem-results/

Hilton, M., Sherrington, C., Mccarthy, A., & Börkey, P. (2019). *EXTENDED PRODUCER RESPONSIBILITY (EPR) AND THE IMPACT OF ONLINE SALES-ENVIRONMENT WORKING PAPER N° 142*. Retrieved February 9, 2023, from www.oecd.org/environment/workingpapers.htm

H&M. (n.d.a). *Startside/H&M Home*. Retrieved April 3, 2023, from

https://www2.hm.com/da_dk/home.html

H&M. (n.d.b). *STARTSIDE/SPORT*. Retrieved April 3, 2023, from https://www2.hm.com/da_dk/sport.html

H&M. (n.d.c). *STARTSIDE/H&M HOME*. Retrieved April 3, 2023, from https://www2.hm.com/da_dk/home.html

H&M. (n.d.e). *H&M Take Care*. Retrieved April 3, 2023, from https://www2.hm.com/en_gb/sustainability-at-hm/take-care/take-care.html

H&M. (n.d.f). *Let's Close the Loop*. Retrieved April 3, 2023, from https://www2.hm.com/en_gb/sustainability-at-hm/our-work/close-the-loop.html

H&M. (n.d.g). *How H&M Rental Works*. Retrieved April 22, 2023, from https://www2.hm.com/en_gb/ladies/sustainability/9035-howdoesitwork.html

H&M Group. (n.d.a). *Brands - H&M Group*. Retrieved March 21, 2023, from https://hmgroup.com/brands/

H&M Group. (n.d.b). *Supply chain*. Retrieved March 21, 2023, from https://hmgroup.com/sustainability/leading-the-change/transparency/supply-chain/

H&M Group. (n.d.c). *Water*. Retrieved April 14, 2023, from https://hmgroup.com/sustainability/circularity-and-climate/water/

H&M Group. (n.d.d). *Packaging*. Retrieved April 14, 2023, from https://hmgroup.com/sustainability/circularity-and-climate/packaging/

H&M Group. (n.d.e). *Circular Business Models*. Retrieved April 14, 2023, from https://hmgroup.com/sustainability/circularity-and-climate/circularity/circular-business-models/

H&M Group. (n.d.f). *Collect, recirculate and recycle - H&M Group*. Retrieved April 14, 2023, from https://hmgroup.com/sustainability/circularity-and-climate/recycling/#Garment_collection

H&M Group. (n.d.g). *Store Count per Brand*. Retrieved April 14, 2023, from https://hmgroup.com/about-us/markets-and-expansion/store-count-per-brand/

H&M Group. (2018). *The H&M Group - the first 70 years*. Retrieved April 15, 2023, from https://about.hm.com/content/dam/hmgroup/groupsite/documents/en/Digital%20Annual%20Report/2017/Annual%20Report%202017%20Our%20history.pdf

H&M Group. (2019). *H&M Group continues to invest in Sellpy - H&M Group*. Retrieved

April 15, 2023, from https://hmgroup.com/news/hm-group-continues-to-invest-in-sellpy/

H&M Group. (2020). *H&M Group Sustainability Performance Report*. Retrieved April 3, 2023, from https://hmgroup.com/wp-content/uploads/2020/10/HM-Group-Sustainability-Performance-Report-2019.pdf

H&M Group. (2021a). H&M Group - Annual Report 2020. Retrieved April 14, 2023, from https://hmgroup.com/wp-content/uploads/2021/04/HM-Annual-Report-2020.pdf

H&M Group. (2021b). *Arket Rental.* Retrieved April 14, 2023, from https://hmgroup.com/news/arket-starts-renting-out-childrenswear-to-encourage-reuse-and-re-wear/

H&M Group. (2021c). *Sustainability Performance Report 2020*. Retrieved April 22, 2023, from https://hmgroup.com/wp-content/uploads/2021/03/HM-Group-Sustainability-Performance-Report-2020.pdf

H&M Group. (2022a). *H&M Group - Annual and Sustainability Report 2021*. Retrieved April 22, 2023, from https://hmgroup.com/wp-content/uploads/2022/03/HM-Group-Annual-and-Sustainability-Report-2021.pdf

H&M Group. (2022b). *Responsible Raw Material Sourcing Policy*. Retrieved April 15, 2023, https://speakup.hmgroup.com

H&M Group. (2022c). *Sustainability Disclosure 2021*. Retrieved April 3, 2023, from https://hmgroup.com/wp-content/uploads/2022/03/HM-Group-Sustainability-Disclosure-2021.pdf

H&M Group. (2023a). *H&M Group - Annual and Sustainability Report 2022*. Retrieved April 3, 2023, from https://hmgroup.com/wp-content/uploads/2023/03/HM-Group-Annual-and-Sustainability-Report-2022.pdf

H&M Group. (2023b). *H&M Group Sustainability Disclosure 2022*. Retrieved April 22, 2023, from https://hmgroup.com/investors/annual-and-sustainability-report/

H&M Group. (2023c). H&M Group Supplier List March 2023. Retrieved April 4, 2023, from https://hmgroup.com/sustainability/leading-the-change/transparency/supply-chain/

H&M Rewear. (n.d.). *H&M Rewear: The sustainable way to buy and sell fashion*. Retrieved April 14, 2023, from https://rewear.hm.com/ca-en

Inditex. (n.d.a). *Our Approach*. Retrieved March 19, 2023, from https://www.inditex.com/itxcomweb/en/group/our-approach

Inditex. (n.d.b). *About Zara Pre-owned | ZARA United Kingdom*. Retrieved April 5, 2023, from https://www.zara.com/uk/en/preowned-about-mkt5795.html?v1=2213607

Inditex. (n.d.c). *ZARA Danmark | Ny Kollektion Online*. Retrieved April 27, 2023, from https://www.zara.com/dk/

Inditex. (2020). Annual Report 2019. In *2020*. https://static.inditex.com/annual_report_2019/pdfs/en/memoria/2019-Inditex-Annual-Report.pdf

Inditex. (2021). *Inditex Group Annual Report 2020*. Retrieved April 3, 2023, from https://static.inditex.com/annual_report_2020/assets/pdf/pdfseng/BLOQUES_ING/ANUAL%20REPORT_ING_12_web.pdf

Inditex. (2022a). *Statement on Non-Financial Information 2021*. https://www.inditex.com/itxcomweb/api/media/8cae4f70-40ea-4152-9688-732c4fdd8d91/2021_inditex_statement_of_non_financial_information.pdf?t=1655306399672

Inditex. (2022b). *INDITEX ANNUAL REPORT 2021*. Retrieved April 3, 2023, from https://static.inditex.com/annual_report_2021/en/documents/annual_report_2021.pdf

Inditex. (2023a). *Inditex Group Annual Report 2022*. https://static.inditex.com/annual_report_2022/pdf/Inditex-group-annual-report-2022.pdf

Inditex. (2023b). *Inditex - Statement of non-financial information 2022*. Retrieved April 7, 2023, from https://static.inditex.com/annual_report_2022/pdf/Statement-on-non-financial-information-2022.pdf

IPCC. (2022, February 28). *Climate change: a threat to human wellbeing and health of the planet. Taking action now can secure our future — IPCC*. Retrieved April 3, 2023, from https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/

Juntunen, J. K., & Martiskainen, M. (2021). Improving understanding of energy autonomy: A systematic review. *Renewable and Sustainable Energy Reviews*, *141*.

Kalmykova, Y., Sadagopan, M., & Rosado, L. (2018). Circular economy - From review of theories and practices to development of implementation tools. *Resources, Conservation and Recycling*, *135*, 190–201.

Kaplan, P. O., Decarolis, J., & Thorneloe, S. (2009). Is it better to burn or bury waste for clean electricity generation? *Environmental Science and Technology*, *43*(6), 1711–1717.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An

analysis of 114 definitions. *Resources, Conservation and Recycling*, *127*, 221–232.

Kopnina, H. (2018). Circular economy and cradle to cradle in educational practice. *Journal of Integrative Environmental Sciences*, *15*(1), 119–134.

Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). Circular Economy: The Concept and its Limitations. *Ecological Economics*, *143*, 37–46.

Krishna, M., Manickham, V., Shah, A., & Davergave, N. (2017). *Environmental Manage ment*. Retrieved April 15, 2023, from https://ebookcentral-proquest-com.esc-web.lib.cbs.dk/lib/kbhnhh-ebooks/reader.action?docID=4790772

Krosofsky, A. (2021). *Why Are Emissions Bad for the Environment?* Green Matters. Re trieved April 3, 2023, from https://www.greenmatters.com/p/why-are-emissions-bad-for-the-environment

Lima, M., & Baudier, P. (2017). Business Model Canvas Acceptance among French Entre preneurship Students: Principles for Enhancing Innovation Artefacts in Business Education. *Journal of Innovation Economics & Management*, *n° 23*(2), 159–183.

MacCormack, A., Crandall, W., Henderson, P., & Toft, P. (2012). Do You Need a New Prod uct-Development Strategy? *Research-Technology Management*, *55*(1), 34–43.

Major, J. S., & Steele, V. (2023). *Fashion industry - Fashion design and manufacturing*. Bri tannica. Retrieved March 29, 2023, from https://www.britannica.com/art/fashion-industry/Fashion-design-and-manufacturing

Mao, Y., Robinson, D., & Purvis, B. (2019). The Concept of Sustainable Economic Develop ment. *Sustainability Science*, *14*, 681–695.

MAPFRE. (n.d.). *Inditex's centralized logistics. A successful model for reaching the entire world*. Global Risks. Retrieved March 29, 2023, from https://www.mapfreglobalrisks.com/en/risks-insurance-management/article/inditexs-centralized-logistics-a-successful-model-for-reaching-the-entire-world/

Massa, L., & Tucci, C. L. (2013). Business Model Innovation. In M. et al. Dodgson (Ed.), *The Oxford Handbook of Innovation Management* (pp. 420–441).

McDonough, W., & Braungart, M. (2002). *Cradle To Cradle* (1.). North Point Press.

McNally, R. C., Akdeniz, M. B., & Calantone, R. J. (2011). *New Product Development Pro cesses and New Product Profitability: Exploring the Mediating Role of Speed to Market and Product Quality*.

Mcneill, L., & Moore, R. (2015). Sustainable fashion consumption and the fast fashion co nundrum: Fashionable consumers and attitudes to sustainability in clothing choice. *International Journal of Consumer Studies*, *39*(3), 212–222.

Mihelcic, J. R., Crittenden, J. C., Small, M. J., Shonnard, D. R., Hokanson, D. R., Zhang, Q., Chen, H., Sorby, S. A., James, V. U., Sutherland, J. W., & Schnoor, J. L. (2003). Sustainability Science and Engineering: The Emergence of a New Metadiscipline. *Environmental Science & Technology*, *37*, 5314–5324.

Monki. (n.d.). *Monki*. Retrieved May 10, 2023, from https://www.monki.com/en_dkk/in dex.html

Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Elsevier*, *58*, 726–735.

Muraca, B., & Schmelzer, M. (2017). Sustainable degrowth: Historical roots of the search for alternatives to growth in three regions. *History of the Future of Economic Growth* , 174–197.

Nizzoli, G. (2022). Toxic Chemicals in Clothing: Time to Tackle This Itchy Subject! | Sus tainable Fashion Blog | Project Cece. *Project CECE*. Retrieved March 25, 2023, from https://www.projectcece.com/blog/549/toxic-chemicals-in-clothing-and-fast-fashion/

OECD. (n.d.). *Material Productivity*. Retrieved March 17, 2023, from https://data.oecd.org/materials/material-productivity.htm

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation : A Handbook for Vision aries, Game Changers, and Challengers*. John Wiley & Sons, Inc.

Oxford Advanced Learner's Dictionary. (n.d.). *Definition of Sustainability noun from the Ox ford Advanced Learner's Dictionary*. Retrieved February 3, 2023, from https://www.oxfordlearnersdictionaries.com/definition/english/sustainability?q=sustaina bility

Ozdil, S. (2020). *How Does Inditex Manage Worldwide Distribution Within 48 Hours?* MoreThanShipping.Com. Retrieved April 7, 2023, from https://www.morethanshipping.com/how-does-inditex-manage-worldwide-distribution-within-48-hours/

Paton, E., & Maheshwari, S. (2019, December 18). *H&M's Different Kind of Clickbait - The*

New York Times. Retrieved March 20, 2023, from https://www.nytimes.com/2019/12/18/fashion/hms-supply-chain-transparency.html

Pedersen, K., & Bitsch Olsen, P. (2018). *Problemorienteret projektarbejde : en værktøjsbog*. Samfundslitteratur.

Pires, A., & Martinho, G. (2019). *Waste hierarchy index for circular economy in waste man agement*. Elsevier.

Pucker, K. P. (2022). *The Myth of Sustainable Fashion*. Harvard Business Review. Retrieved March 14, 2023, from https://hbr.org/2022/01/the-myth-of-sustainable-fashion

Rauturier, S. (2022). Fashion's Water Impacts: The Largest Brands Are Doing the Least - Good On You. *Good On You*. Retrieved March 25, 2023, from https://goodonyou.eco/fashions-water-impacts/

ReHubs. (n.d.). *Circulating Textile Waste Into Value*. EURATEX. Retrieved April 5, 2023, from https://www.rehubs.eu/#about

Sadowski, M., Perkins, L., & McGarvey, E. (2021). Roadmap to Net Zero: Delivering Sci ence-Based Targets in the Apparel Sector. *World Resources Institute*.

Sarker, M. M., Das, B. K., Islam, A., Das, B. K., & Akter, S. (2019). Green Supply Chain Management Practices for Green Apparel . *International Journal of Scientific & Engineering Research*, *10*(1), 1764–1768.

Sellpy. (n.d.). *Sellpy - To better use | Køb nemt second hand online på sellpy.se*. Retrieved April 14, 2023, from https://www.sellpy.dk/howItWorks

Shafer, S. M., Smith, J. H., & Linder, J. C. (2005). The Power of Business Models. *Elsevier*, *48*, 199–207.

Simon, J. M. (2019). *A zero waste hierarchy for Europe - Zero Waste Europe*. Zero Waste Europe. Retrieved March 5, 2023, from https://zerowasteeurope.eu/2019/05/a-zero-waste-hierarchy-for-europe/

Simon, O. (2021). What are The Most Polluting Industries? This is Why Sustainability is Se rious Talk | LinkedIn. *LinkedIn*. Retrieved may 5, 2023, from https://www.linkedin.com/pulse/what-most-polluting-industries-why-sustainability-serious-oren-simon/

Söderlund, J. (2010). Knowledge entrainment and project management: The case of large-

scale transformation projects. *International Journal of Project Management*, *28*, 130–141.

Sotos, M. (2015). GHG Protocol Scope 2 Guidance Executive Summary - An amendment to the GHG Protocol Corporate Standard. *GHG Protocol*. Retrieved April 7, 2023, from www.ghgprotocol.org.

Statista. (2022). *Fast fashion in Europe | Statista*. Retrieved March 5, 2023, from https://www-statista-com.esc-web.lib.cbs.dk/study/70830/fast-fashion-in-europe/

Sustainable Fashion. (n.d.). *Recycled Cotton is Still an Emerging Fabric*. Retrieved April 5, 2023, from https://sustainfashion.info/recycled-cotton-is-still-an-emerging-fabric/

Terrell, E. (2019). Research Guides: Fashion Industry: A Resource Guide: Introduction. *Li brary of Congress*. Retrieved March 29, 2023, from https://guides.loc.gov/fashion-industry/introduction

Textile Exchange (a). (n.d.). *Who We Are - Textile Exchange*. Retrieved March 23, 2023, from https://textileexchange.org/about/

Textile Exchange (b). (n.d.). *Methodology – Textile Exchange*. Retrieved March 23, 2023, from https://mci.textileexchange.org/methodology/

ThredUp. (n.d.). *H&M Announces "H&M Pre-Loved," a Resale Program Enabled by thredUP's Resale-as-a-Service® — thredUP newsroom*. Retrieved April 14, 2023, from https://newsroom.thredup.com/news/hampm-announces-hampm-pre-loved-a-resale-program-enabled-by-thredups-resale-as-a-service

United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future* .

United Nations. (2015). *Paris Agreement*. Retrieved March 29, 2023, from https://un fccc.int/sites/default/files/english_paris_agreement.pdf

United Nations Environment Programme. (n.d.). *Eco-labelling*. Retrieved March 17, 2023, from https://www.unep.org/explore-topics/resource-efficiency/what-we-do/responsible-industry/eco-labelling

United Nations Environment Programme. (2022). *The environmental costs of fast fashion*. Retrieved March 20, 2023, from https://www.unep.org/news-and-stories/story/environmental-costs-fast-fashion

Verhoeven, G. (2023). *Using the Higg Index to trace environmental impact results as we*

drive towards more sustainable textile production - Sustainable Apparel Coalition. Retrieved March 25, 2023, from https://apparelcoalition.org/blog/using-the-higg-index-to-trace-environmental-impact-results-as-we-drive-towards-more-sustainable-textile-production/

Vilella, M. (2020). SUSTAINABLE FINANCE FOR A ZERO WASTE CIRCULAR ECON OMY. *Zero Waste Europe*. Retrieved March 10, 2023, from www.worldbank.org/en/news/press-release/2020/06/02/countries-can-take-steps-now-to-speed-recovery-from-covid-19

Villena, V. H., & Gioia, D. A. (2020). A More Sustainable Supply Chain. *Harvard Business Review*. Retrieved March 20, 2023, from https://hbr.org/2020/03/a-more-sustainable-supply-chain

Wade, G. (2023). Location Vs Market-Based Carbon Reporting. *Zevero*. Retrieved March 25, 2023, from https://www.zevero.earth/post/location-vs-market-based-carbon-reporting

WEEKDAY. (n.d.). *WEEKDAY*. Retrieved April 3, 2023, from https://www.week day.com/en_dkk/index.html

World Business Council for Sustainable Development (WBCSD). (n.d.). *Take-back program - Circular Economy Guide*. Retrieved April 26, 2023, from https://www.ceguide.org/Strategies-and-examples/Dispose/Take-back-program

ZARA. (n.d.). *ZARA REGISTRATION AND LOG IN*. N.d. Retrieved April 20, 2023, from https://www.zara.com/in/en/help-center/RegisterAndLogin

Zero Waste. (2020). *What is the Zero Waste Hierarchy and How Can I Use it? | Zero Waste*. Retrieved March 29, 2023, from https://www.zerowaste.com/blog/what-is-the-zero-waste-hierarchy/

Zero Waste Europe. (n.d.). *The Movement - Our network*. Retrieved March 2, 2023, from https://zerowasteeurope.eu/the-movement/our-network/