Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

MANAGEMENT AND INDUSTRIAL STRATEGY

MASTER´S FINAL WORK

DISSERTATION

EMBRACING CIRCULAR ECONOMY PRACTICES: CASE STUDY OF IKEA

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SUPERVISION:

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ABSTRACT

Recently circular economy is high on agenda as it is considered the substitute of linear economy – main source of emissions and depletion of resources. By closing the loop, circular economy aims to use resources that have been extracted already and thus leads to efficient resources utilization, reduction of waste and emissions, produced by companies.

The purpose of this work is to describe how circular economy practices are implemented in furniture industry on the example of IKEA, the largest retailer and manufacturer in the industry. Even though circular economy and its practices are of current interest, research on this topic is not consistent and sometimes contradictive. This way, the current work aims to contribute to the more detailed understanding of the concept of circular economy practices through the critical review of the literature on the related topic, as well as collecting empirical data in the industry that is considered traditional and hence characterized by the low overall level of circularity, with the goal to facilitate shift to CE in furniture manufacturing industry.

In this study qualitative method of descriptive character was used as a research design, which allowed to gain the insight on the topic under research. Research strategy chosen for the current work was a case study with interviews as the main source of data collection, complemented by data received from documentation and direct non-participatory observation.

This research allowed us to conclude that circular economy practices implemented by IKEA consist of majority of R practices along with designing products for circularity, reverse logistics, customer awareness and extended manufacturer responsibility. It was also concluded that IKEA finds circular mindset, trainings, collaboration and technology as enablers of CE. In terms of barriers, this study came to the conclusion that IKEA faces lack of infrastructure for composting and recycling, need of technologies, lack of renewable analogues for some materials along with economic and regulatory barriers. Main ecological results achieved by IKEA by 2022 is reduction of 12% footprint, comparing to baseline and 6% reduction in comparison with 2021.

Keywords: circular economy, CE practices, enablers of CE. barriers of CE

RESUME

Recentemente, a economia circular está no topo da agenda, uma vez que é considerada o substituto da economia linear - principal fonte de emissões e de esgotamento de recursos. Ao fechar o ciclo, a economia circular tem como objetivo utilizar os recursos que já foram extraídos, conduzindo assim a uma utilização eficiente dos recursos, à redução dos resíduos e das emissões produzidas pelas empresas.

O objetivo deste trabalho é descrever a forma como as práticas da economia circular são implementadas na indústria do mobiliário, com base no exemplo da IKEA, o maior retalhista e fabricante do sector. Embora a economia circular e as suas práticas sejam de interesse atual, a investigação sobre este tema não é consistente e é por vezes contraditória.

O presente trabalho visa contribuir para a compreensão mais detalhada do conceito de práticas de economia circular através da revisão crítica da literatura sobre o tema relacionado, bem como da recolha de dados empíricos na indústria que é considerada tradicional e, portanto, caracterizada pelo baixo nível geral de circularidade para facilitar a mudança para a EC na indústria de fabrico de mobiliário.

Neste estudo foi utilizado o método qualitativo de carácter descritivo como desenho de investigação, o que permitiu obter uma visão sobre o tema em investigação. O estudo de caso foi aplicado como estratégia, sendo as entrevistas a principal fonte de recolha de dados, complementadas por dados provenientes de documentação e observação direta não participante.

Esta investigação permitiu-nos concluir que as práticas de economia circular implementadas pela IKEA consistem na maioria das práticas R, juntamente com a conceção de produtos para a circularidade, logística inversa, a sensibilização dos clientes e a responsabilidade alargada do fabricante. Concluiu-se também que a IKEA considera a mentalidade circular, as formações e a colaboração como facilitadores da EC. Em termos de barreiras, este estudo chegou à conclusão de que a IKEA enfrenta a falta de infraestruturas para compostagem e reciclagem, a necessidade de tecnologias, a falta de análogos renováveis para alguns materiais, juntamente com barreiras

económicas e regulamentares. Os principais resultados ecológicos alcançados pela IKEA até 2022 são uma redução de 12% da pegada ecológica, em comparação com a linha de base, e uma redução de 6% em comparação com 2021

Palavras-chave: economia circular, práticas de EC, facilitadores de EC, barreiras de EC

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1. INTRODUCTION

Nowadays influence of human activities on environment and society is very concerning. The main cause of this concern is manufacturing industry, as the emissions and waste produced by their supply chain are leading to serious environmental problems such as depletion of resources and waste propagation (Tsai et al., 2021). Since the number of companies in manufacturing industry is growing every year, the amount of produced by them emissions is also increasing. Fortunately, it is possible to turn existing challenges into entrepreneurial opportunities, hence companies are seeking for solutions which would improve both financial and environmental performance (Shetty & Bhat, 2022).

Circular economy (CE) is the concept that undertakes, among others, such global environmental challenges as climate change, pollution and waste, loss of biodiversity through separation of economic activity and resources consumption (Ellen Macarthur Foundation, 2017). According to Kirchherr et al. (2017, p. 224), CE "describes an economic system, based on business models, which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes...". European Commission estimated the approximate gain of 600 billion euro per year for the manufacturing sector if circular economy is implemented (Grafström & Aasma, 2021). The concept of CE has lately regained attention of scientists, governments and entrepreneurs and is considered an alternative to the linear model (Rocca et al., 2023). The existing linear model, also known as take-make-dispose model, is approaching to its physical limitations, being the main source of natural resources depletion and generation of waste and emissions (Suchek et al.,2021). By contrast CE stimulates the reuse of resources to maximize their value and restore it within the supply chain (Singh et al., 2022).

Transition towards circular economy leads to efficient utilization of resources, reduction of produced waste and emissions and contributing to a possibility of growth with minimal negative environmental effects and, as a result, reveals economic, social, and environmental values (Woldeyes et al., 2022).

Shifting from linear to circular economy is being carried out by means of circular economy practices implementation (Suchek et al., 2021). CE practices can be defined as activities aiming for optimal utilization of raw materials, products, spare parts as well as energy consumption and, therefore, mitigating the negative environmental impact of production processes (Khan & Haleem, 2021). Even though CE practices are connected to environmental practices, it is misleading to treat two of these concepts as synonymous, thus an eco-friendly product does not necessarily mean it is circular (Gusmerotti et al., 2019). The main distinction of environmental practices from CE practices is that the latest implies creation of circular loops, where waste is used as an input for a new product, because CE´s goal is waste and pollution elimination by reusing and recycling materials as well as regenerating natural systems (Grafström & Aasma, 2021; Sikdar, 2019).

It is considered relevant to study this concept in the context of furniture manufacturing industry, because CE is one of the main tools not only to cope with environmental problems, which nowadays are high on agenda, but also to boost economic performance of organization and to increase their competitiveness (Woldeyes et al., 2022).

Thus, this study aims to answer the following research question: **How are circular economy practices implemented by IKEA?** The research question of the current study is accompanied by the following objectives:

- in-depth understanding and description of CE practices implemented by IKEA;
- exposition of main barriers and enablers of CE practices implementation faced by IKEA;
- description of the main results that IKEA has been achieving with adopting of CE practices.

In order to answer defined research question and fulfill described objectives, the critical review of literature was conducted and empirical data was collected. The research design chosen for the current work is a single case study, with interviews as a principal source of data collection supported by data collected from external documentation and direct non-participatory observation. By collecting empirical data this study aims to contribute to the more detailed understanding of the concept of circular economy practices by handling the research in the industry that wasn´t studied sufficient before in the context of above-mentioned concepts and thus facilitate the process

of transition from linear to circular economy for the companies in furniture manufacturing industry.

As it was mentioned before, CE by means of its practices is being strategically important element in reducing environmental impact, however, the existing research on this topic is inconsistent and contradictory (Seman, 2019). Analysis of the literature revealed that even though sufficient number of studies were devoted to circular economy in general, there is still no consensus on definition of CE and, consequently, coherence in the understanding of the concept itself (Kircherr et al., 2017). Moreover, there is a scarcity of studies that were dedicated to circular economy practices and factors of their implementation for shift from linear to circular economy (Singh et al.,2022). There is no consensus on some terms, suchwise by the terms "3R", "6R", "9R" etc. different practices are used by different authors (Gaustad et al., 2018; Reike et al., 2018). Likewise, there was little attention paid for circular practices in traditional industries, such as furniture manufacturing, and overall information about circular economy practices is very diffused in different fields (Schroeder et al., 2019). Furthermore, CE literature has a challenge to evaluate the real state of CE practices' adoption (Calzolari et al.,2021).

The current work consists out of five chapters, with the first one corresponding to introduction and in the second chapter scientific literature on the subject of the study was reviewed and analyzed. Succeeding is chapter devoted to methodology, where detailed research design is performed and then data presentation, analysis and discussion of results obtained through collection of empirical data. Finally, the fifth chapter describes conclusions and limitations of the current study along with suggestions for further studies.

2. LITERATURE REVIEW

The literature review aims to design a theoretical frame to the present study. We will start by presenting the concept of circular economy and its evolution and then we will move to the topic of circular economy practices. Next, we will describe enablers of CE practices implementation and barriers towards it.

2.1. Concept of Circular Economy (CE)

Despite the overall environmental concerns, global economy is still based on a linear model of resource consumption, that can be defined as "take-make-dispose". Following the linear model, companies extract raw materials and use them for product manufacturing, after that the product is being used by consumer and then disposed (EllenMcArthur Foundation, 2017). This way, linear economy model assumes that the production and usage of products generate waste, all of which in the long run is being eliminated, leading to the pollution of environment. Furthermore, natural resources are finite and in case of unlimited extraction it would be fully depleted (Jawahir & Bradley, 2016).

CE concept is designed to contrapose to the concept of linear economy and to cover its existing failures. The main idea of circular economy is to use waste as input for further production, repeating "production – reuse - recycle" circle infinitely (Skidar, 2019). Its main goal is in-depth modification of the way that resources are being used, generating from it more value for longer time (Urbinati et al., 2017), fortunately it can be applied to all kind of resources, including natural resources such as water, land, biotic and abiotic materials (Schroeder et al., 2019). Hence, circular economy is based on three principles: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature (EllenMcArthur Foundation, 2017).

Although the concept of CE is regaining popularity nowadays, it is not entirely new (Geissdoerfer et al., 2017). It is rooted in the understanding of Earth's resources limits (Kalmykova, 2018) and, according to Andersen (2007) and Grafström & Aasma (2021) was initially brought by Kenneth E. Boulding in 1966 in his work "Economics of the coming spaceship earth". In the paper Boulding (1966, p. 2) suggests that "in a closed system, the outputs of all parts of the system are linked to the inputs of other parts. There are no inputs from outside and no outputs to the outside; indeed,

there is no outside at all". Thus, in his work Boulding mentioned the closed loop system, where "output" is directly connected to the "input" which can be seen as a prototype of circular loop.

According to Reike et al. (2018), evolution of the CE concept may be divided into three main phases: 1st phase (1970–1990) – waste management, 2nd phase (1990–2010) devoted to strategies for ecological efficiency and 3d phase (2010-present) – for value retention. After the second world war economies starting to recover, increasing the manufacturing of the products, and, as a consequence, producing more waste. Thus, the first phase is devoted to waste management. The 3R (reduce, reuse, recycle) concept was born and high on agenda at this time. During this phase the waste generation wasn't prevented, but were invented pollution reducing principles, such as "polluter pays". Scientific research was addressed to waste management as well as recycling and separation (Reike et al., 2018). During the second phase ecological problems are seen as commercial opportunities to gain profit form improved efficiency or good environmental reputation. The creation of some concepts, such as design for environment, had impact on the development of circular economy concept and the latter start to gain notability. The link between circular economy and waste management was noticed, thus the possible ways of zero-waste production were gaining momentum at this time. In the beginning of XXI century, scientific research on global warming, water shortages, depletion of the ozone layer and other environmental concerns emerging in the literature (Reike et al., 2018; Trushkina & Prokopyshyn, 2021). Over the third phase the forming of circular economy concept was carrying the intention to separate growth from usage of resources, because the continuous diminishment of the latter along with generation of waste creates a threat to human survival. Therefore, such principles as green innovation and use of alternative sources were highly promoted among companies (Reike et al., 2018; Trushkina & Prokopyshyn, 2021).

As it was described above, the concept of circular economy appeared in the second half of the last century, however it regained popularity only recently (Barreiro-Gen & Lozano, 2020). Nowadays circular economy concept attracts attention of businessmen along with scholars since it is conjugated with the widely discussed concept of sustainable development. The broad scope and nature together with diverse conceptual background of circular economy explains the variety of

definition existing in scientific literature and lack of consensus regarding concept interpretation (Grafström & Aasma, 2021; Kirchherr et al., 2017; Schroeder et al., 2019).

Kirchherr et al. (2017, p. 224) reviewed and analysed around 114 definitions of circular economy, highlighted all the important characteristics of the concept appearing in various definitions and proposed a new definition that includes those characteristics. According to them, "circular economy describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations".

As it was mentioned in the definition above, implementation of CE implies actions at three different levels: macro level, meso level and micro level (Ghisellini et al., 2016; Su et al., 2013). Macro level covers cities, regions and municipalities using the legislation as the essential tool for implementation of CE, EU circular economy package can serve as an example (Suarez-Eiroa et al., 2019). Meso level is focused on cross-organizational and cross-chain unions, that have such initiatives as eco-industrial parks, where waste (material or energy) of one organization becomes the raw material for another organization with the purpose of efficient usage of resources (Barreiro-Gen & Lozano, 2020). Micro level represents initiatives of particular firms and organisations, most of such initiatives are known as practices of CE, the biggest part of which are taken by so called R-principles aimed to produce zero waste (Grafstrom & Aasma, 2021).

2.2. Circular Economy practices

Circular economy practices are activities, that aim to incorporate environmental concerns into society for optimization of raw materials and energy consumption and, therefore, mitigate the negative impact of production processes (Khan & Haleem, 2021). One of the key goals of circular economy practices is to extend the life cycle of materials, that have already been extracted from the ecosphere (Gaustad, 2018).

After analysing the literature on CE practices, it was observed a wide range of practices introduced by different authors. The most common circular economy practices are known in the literature as R principles or imperatives (De Pascale et al., 2020). 3R principles, which refers to 3 key practices: reduce, reuse, recycle - are the ones circular economy was based on for a long time. These practices were also used as underlying principles for green manufacturing (Jawahir &Bradley, 2016). The combination of these principles builds the following scheme: first, it's important to **reduce** the input of primary raw materials and energy used for production along with prevention or **reduction** of the amount of generated waste (Kabirifar et al., 2020). It can be feasible by implementation of better technologies or using recyclable materials. After there should be identified the methods of materials **reuse**, which implies numerous usages of the resource to ensure the decrease of the amount of resources used in manufacture as well as using the waste of production as the input material (Grafström & Aasma, 2021; Su et al., 2013). Moreover, products or/and waste from one company can be used as input material for another company. When resources cannot be reused, then should be **recycled** (Kabirifar et al., 2020). Recycling principle refers to any recovery allowing to transform waste materials into the product or input either for original purpose or for another one, leading to a decrease in usage of virgin materials (Su et al., 2013). According to Kirchherr et al. (2017), nowadays recycling is a process that degrades materials, because most of used recycling systems are not able to create secondary resources of good quality out of waste streams.

However, in the scientific literature there is no consensus in the specific practices used by term "3R", thus, Gaustad et al. (2018) suggested that practices attributed to 3R principle are recycling, remanufacturing, reuse, while Wang and Hsu (2010) mentioned that 3R stands for reduction, recovery, and reuse. Furthermore, the amount of R principles varies in the literature from 3R to 10R (Reike et al., 2018). In this manner Barreiro-Gen & Lozano (2020) mentions 4R, were together with reduce and recycle appears such practices as **remanufacture** and **repair**. **Remanufacture** implies creation of new products from an old product or its components as well as restoration of the product to its original or like new state by disassembling, cleaning, parts replacement, or repair. The important characteristic of remanufacturing is to retain the original product's function in the same application; thus, the product is rebuilt in a combination of old,

new, and reprocessed parts (Jawahir & Bradley, 2016; Reike et al. 2018). Generally, quality of remanufactured products not inferior to quality of new products (Singhal et al., 2020). The main purpose of **repair** principle is to postpone product´s end of life by recreating its original functions. Repairment can be done by different actors such as repair company or customer with or without shifting in possession (Gaustad et al., 2018, Pan et al., 2022). Govindan & Hasanagic, (2018) referrers to 6R, which along with reduce, reuse, recycle, remanufacture practices include **recover** and **redesign** practices. **Recover** practice involves products collection after their usage, disassembling, then sorting and cleaning, so in this way it can be used in the next life cycles. The **redesign** practice is based on the usage of components form previous product generations to upgrade the new products (Jawahir & Bradley, 2016).

Van Buren, (2016) referrers to 9R principles, where appears such new principles as **refuse**, **refurbish**, **repurpose** and **recover energy**. **Refuse** principle is applicable to both: producers and customers. For producers this principle refers to refuse using hazardous materials, while for consumers it refers to "buying less" approach, which will lead to waste reduction (Reike et al., 2018). **Refurbish** practice is described by preserving the overall structure of multi-component product, but secondary components are replaced or repaired, leading to a product upgrade (Reike et al., 2018). Some authors, for instance Barnabè & Nazir (2022), state that **repurpose** practice is just a new name for redesign which is described as using components and materials from previous models to produce a product of next generation. At the same time some different authors such as Van Buren (2016), Reike et al. (2018) refer to **repurpose** as the new practice intended to reuse the product or components, that is in the end of life cycle, for a different purpose, which helps it to obtain a new life cycle. Energy recovery means extraction of energy from waste that cannot be recycled by incineration and, thus, creation of a sustainable source of energy which can be either in form of biofuel or electrical one. According to Kirchherr et al. (2017), recovery of energy is the final point in resource life cycle which is carried out by degrading and decomposing materials into heat, emissions and ashes.

Two new practices (10-11R) introduced by Reike et al. (2018) are **re-mine** and **re-servitization,** where the latest is a new potential R-principle. According to Reike et al. (2018), **re-mine** practice is the most forgotten or ignored among CE practices and can be described as the retrieval of

materials after the landfilling phase. **Re-servitization** practice wasn´t mentioned as a separate practice, because according to authors it is highly interrelated with other practices. It is defined by Reike et al. (2018 p. 257) as "adapting services and the development of product service systems (PSS) – as part of CE business models". The main goal of PSS is efficient use of natural resources, which requires close collaboration between producers and consumers (Barreiro-Gen & Lozano, 2020).

Undoubtfully R-principles play one of the key roles in forming CE, however there are other significant practices and **consumer awareness** is one of those (Khan & Haleem, 2021). Its importance is conditioned by the fact that there is a positive correlation between demand for eco-friendly and circular products and their manufacture. The new consumption culture that will create the buying patterns, allowing to cover necessities, but avoiding accumulation, is needed (Khan & Haleem, 2021; Suárez-Eiroa et al., 2019). **Designing products for circularity** is considered another essential practice of CE, aiming to lengthen products´ lifecycle and reduce the waste (Khan & Haleem (2021). According to Bonviu (2014), products, services and processes should be designed to be upgradeable, repairable, with exchangeable parts and more durable to allow further remanufacturing and recycling. Production of products with these capabilities will also increase customer satisfaction (Kirchherr et al., 2017). Another important practice is **extended producer responsibility (EPR),** which is based on "polluter pays" principle. It addresses fully or partially the responsibility and cost for products´ end of life management to manufacturers (Gaustad et al., 2018). The main goal of this practice is to reduce waste as producers, being fully responsible for disposal their waste, are encouraged to enhance their products reusability (Letcher, 2020). **Reverse logistics** appears in the scientific literature as another essential circular economy practice (Butt et al., 2023). It can be described as logistics going to the opposite direction: from the place of consumption to retailer or manufacturer for further products´ value retention (Ding et al., 2023). Thus, manufacturers encourage customers to send products, that are no longer in use, back and those products are returned to the supply by means of repair, remanufacture, reuse practices (Butt et al., 2023).

2.3. Enablers and barriers of CE practices implementations

Successful implementation of circular economy practices depends on several factors, one of which is **engagement of top management** in the subject of circularity (Singh et al., 2022). According to Khan et al. (2020), commitment of top management to shift from linear to circular economy is one of the factors that influence to a great extent successful implementation of CE practices. Circular initiative of the top management commonly translated to a certain goals and specific action plans with innovation and incremental changes along with overall refinements to guide the whole organization towards the goals. Moreover, commonly some structural and cultural changes are needed along with planning of budget, definition of organizational principles and creation of training programs, which is hardly possible without engagement of top management (Hofstetter et al., 2021; Qazi & Appolloni, 2022). **Training programs on circularity** for staff ensure alignment of goals and vision within organization. Workforce training is also considered essential element for adoption of CE practices as the latest demands certain set of knowledge and skills (Khan et al., 2021). Also training contributes to changing individual and organizational **mindset into circular,** which considered another factor for CE practices implementation (Hofstetter, 2021). **Collaboration** is one more element in the recipe of successful implementation of CE practices (Mostaghel & Chirumalla (2021). It includes customers' collaboration along with cross-sectoral collaboration with stakeholders (Gedam et al., 2021), which creates consistent and joint effort in the process of creation and retention of value (Hina et al.,2022).

In a process of shifting from linear to circular economy most of industries require **technology** that will facilitate this transition (Hofstetter, 2021). Technology, including digital, is needed to monitor lifecycle of products and spare parts, improve process of collection and aggregation of products' data along with enhancing quality of data and its availability (Schöggl et al., 2023). Circularity becomes more efficient through digitalization, technologies for waste management and eco-friendly technologies and organizations gain long-term benefits (Fatimah et al., 2020; Khan et al., 2021). Thus**, lack of emerging technologies** and innovation is considered a barrier for CE practices implementation, as technology plays crucial role in this process, fostering performance optimization (Agyemang et al., 2019; Hina et al., 2022).

Lack of infrastructure for effective waste management is also considered a barrier, as it obstructs transformation of waste into material for new products, consequently, provokes creation of waste, which is placed in landfill. Otherwise, the part of material that was recycled might not meet the minimum requirements to be used as input for new products, which is itself considered a barrier towards CE implementation (Grafström & Aasma, 2021; Ranta et al., 2018).

Another barrier for CE practices implementation is **lack of customer awareness** and **consciousness** (Dey et al., 2022). When a purchase is finalized, ownership of a product is transmitted to customers and they are responsible for further decision regarding a product, according to their personal perceptions (Grafström & Svensson, 2021). To enable circular economy customers are expected to cooperate in further reuse of products. Also, awareness of circular economy influences customers' attitude to products that are refurbished, remanufactured, or recycled – frequently customers doubt quality of such products (Hina et al., 2022).

Regulatory barriers in a form of legislation and regulations, which belong to institutional group, are another relevant obstacle on a way of circular economy practices implementation. It can be translated into absence of regulations and its inconsistency: for instance, understanding of what is considered waste in different countries is not coinciding. Gaps in regulations and ineffective policies hinder remanufacturing process and place circular products in a disadvantaged position as well as slows and limits effectiveness of transition from linear to a circular system (Agyemang et al., 2019; Hina et al., 2022). **Economic barriers** are the most widely spread in scientific literature and include difficulties with investments and fundings along with high costs associated to transition to CE (Grafström & Aasma, 2021; Grafström & Svensson, 2021).

3. METHODOLOGY

This chapter describes and justifies methodological choices of the current work. Research design is the overall plan, which illustrates the way research question would be answered and identifies the goal that should be reached by the means of the research question. It includes sources of data collection and describe the ways that are proposed to collect and analyze data (Saunders et al., 2012).

3.1. Research design

For the current study qualitative research was chosen as it shows "the life of participants 'from the inside out', from the point of view of the people, who participate and in the particular context", according to Flick (2004, p.3). Qualitative research is considered suitable when the study aims to collect and analyze non-numerical data, but furthermore to study participants' meanings and the relationships between them (Saunders, 2016). As goals of the current study are in-depth understanding and description of CE practices implemented by IKEA, exposition of main barriers and enablers of CE practices implementation faced by IKEA and description of the main results that IKEA has been achieving with adopting CE practices, to reach these goals it´s important to study and understand the reality with participants´ individual experience and interpretations, and this kind of data can be hardly quantified. What concerns the nature of the research design the current work will be based on a descriptive study, which aims to portray an accurate profile of a specific situation (Saunders, 2016). Descriptive study is considered suitable since the current work aims to gain the understanding and describe CE practices implemented by IKEA and their way of transition from linear to circular economy.

The research method chosen for the current work is a single case study. The case study is an intensive in-depth description and analysis of a phenomenon (Merriam, 2002) and is considered relevant when the study focuses on "how" type of question (Yin, 2009). Case study research is the most suitable method for the current study as it allows to acquire in-depth understanding of CE practices implementation process, grasp the logic of choosing the appropriate practices and observe its influence on company and gather extensive data about it.

IKEA was chosen for a case study in the current work due to the fact the company has a unique experience of being on the way of transition from linear economy to a circular one and aims to be a fully circular business by 2030. IKEA was awarded the "Accenture Strategy Award for Circular Economy" which highlighted the company's efforts to become circular company in all dimensions. As Peter van der Poel, managing investments director at IKEA says: "Being circular business is one of our biggest ambitions for the future. It's about smarter use of resources and, from the very beginning, designing products so they can be repurposed, repaired, reused, resold or recycled" (IKEA wins award at the Circular Economy Awards – IKEA website, n.d.). Single case study is chosen as in furniture manufacturing industry IKEA, being largest furniture retailer and manufacturer, is one of the pioneers in CE implementation and on its transition to circular business IKEA is doing tremendous success, it has a unique experience which is valuable for a case study.

3.2. Data collection

This research uses semi-structured interviews to collect the data. The interview is one of the most essential sources of information in case studies (Yin, 2009). According to Sahoo (2022), interview is a great tool for collecting detailed information, which requires clarification and being extremely appropriate when study aims to describe the process or understand decision-making factors.

In order to ensure data triangulation, interviews were completed by data collected from external documentation as well as from direct non-participatory observation of CE practices implementation at IKEA facilities. Two semi-structured interviews, based on reviewed and analyzed literature, were conducted remotely on 16th and 22nd of August 2023 and had a duration of 70 minutes and 50 minutes accordingly. Semi-structured interviews are characterized by list of themes and questions to be covered, which varies depending on the interviewee: some questions might be changed or skipped in particular interviews, given a specific organisational context or specialization of the interviewee (Saunders, 2016).

To maintain the anonymity of the interviewees, as requested by them, the reference used in the current work is Interviewee A and Interviewee B. Interviewee A is holding the position of

sustainability manager and interviewee B is executing functions of communication manager on circularity and is dedicated to external and internal communication for circularity. Respondents have been working for at least 3 years at their position, thus it was considered that they have sufficient knowledge to bring a value to the current study. The interview guide can be found in the appendix. Since this study is qualitative, the next phases would be used for data analysis: compiling, disassembling, reassembling and interpreting (Saunders et al., 2016).

3.3. Overview of company: IKEA

IKEA is a multinational company devoted to manufacturing and retail of furniture and home accessories. It was founded in Sweden in 1943 by Ingvar Kamprad and was named as abbreviation from initials of founder, the farm where he was raised – Elmtaryd and the village nearby – Agunnaryd. In 1953 IKEA introduced the flatpack technology: self-assembly products, that were at the time solution reducing transportation costs. Since 1950 IKEA started to expand over Sweden and Scandinavia and later outside of it, at the moment IKEA is the largest international furniture manufacturer and retailer with more than 400 stores worldwide, covering Europe, North America, Asia, Australia, and the Middle East. Nowadays IKEA brand is divided into two groups: Inter IKEA Systems B.V. - the owner of IKEA concept and the brand's global franchisor and NGKA Holding B.V.– Franchise Group, that own and operate IKEA sales channels under franchise agreements with Inter IKEA Systems B.V. (Our history – IKEA website, n.d.).

IKEA is known for its Scandinavian design aesthetic, which emphasizes simplicity, functionality and minimalism. IKEA has a strong commitment to sustainability - they focus on sourcing renewable materials, reducing waste, promoting energy efficiency, and have set goals to use 100% renewable energy as well as become climate positive and fully circular business by 2030. (Going circular: a future with zero waste - IKEA website, n.d.).

Overall, IKEA is renowned for its affordable, stylish, and functional furniture offerings, alongside its commitment to sustainability and social responsibility. Its unique shopping experience, extensive product range, and global presence have made it one of the leaders in the furniture retail industry.

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

This chapter aims to present data, collected during research, and to analyse received results. It consists of two subchapters: presentation of data collected during the study, which is divided by topics according to main goals of this work, and discussion of the results arising from research.

4.1. Presentation of results

4.1.1. Circular economy practices implemented by IKEA

During interviews was described one of IKEA's circular projects, called "Second life", it is represented by circular zones in shops, where second-hand furniture and home accessories are being sold. As Interviewee A shared: "You may know we have circular areas in the end of the store, where we sell used products. We call it "Second Life" products, and all these products are marked accordingly, when people go to the circular area, they know the certain products are second life products. When it was launched, it was a tremendous success, and it shows that customers are getting more mature in terms of circularity". During direct non-participatory observation in IKEAs installation, circular zone was observed as well as products with specific labels, which can be seen in figures 3 and 4 accordingly in Annex B.

Interviewee B shared, that "in Sweden there was even opened a whole store, where used furniture is sold". After consulting IKEA's website, it became clear, that the required volume of products for the store was achieved through donation of the furniture, that is no longer used by customers (The world's first IKEA secondhand pop-up opens in Sweden - IKEA website, n.d).

During the time the store was opened, IKEA gained a lot of insight on second hand business and prolonging lifetime of the products. Also, the "Second life" stores can be considered a great learning tool to better meet customers' needs, as Interviewee B mentioned: "Thanks to the second-hand store in Eskilstuna, we have developed our skills in seeing value where you do not always see it". In the website it is also declared that, opening of that store helped IKEA to realise why some of their products are appeared to be waste, what condition they are in when thrown away,

why do people choose to donate products, and to assess customers' interest in buying repaired products. Moreover, according to website, during 2022 sales in second hand stores more than doubled in comparison with 2021, which is represented by around 43 000 products gaining another life instead of being considered waste (The world's first IKEA secondhand pop-up opens in Sweden - IKEA website, n.d).

"Another instrument to prolong lifetime of products is the project called "Buyback", that has been started three years ago. We made it possible to buy back IKEA's articles from our customers that are no longer in use and to say them that they don't have to throw the old furniture, because we are here - we will buy it, repair if needed and we sell it in the circular area" (Interviewee A). According to IKEA's website, to implement the project, a special digital tool was created, where customers upload a photo of an item they want to sell and an estimated price is offered, then the item is delivered to nearest IKEA store, where it is assessed, and the offer price is confirmed. A customer receives stipulated sum on IKEA refund card and the item is sent and sold on circular area (Buyback - IKEA website, n.d). Company also organizes a campaign during which higher prices are paid for used furniture to incent selling furniture back to IKEA. As Interviewee B shared: "Once a year, normally in November, we have a campaign where we pay more for the product then the regular months, let's say as an incentive to have the products sold to us, so we can extend their life after". Another input for circular stores and areas are items from exhibitions, showrooms, and references in the store, which cannot be sold in the conventional store, however after some repairing or refurbishment, when needed, furniture gain look like new state. "Exhibition product that were on the first floor for a couple of weeks, they are not in condition to be sold as new. Sometimes these pieces of furniture need to be fixed or repaired, this can be done by our colleagues and after we sell it in the circular area" (Interviewee A).

In some markets IKEA piloted new projects, such as leasing of furniture, which is being tested now. "Another service that could also contribute a lot for a circularity goal would be to rent furniture instead of selling it, which is currently being tested" (Interviewee A). Although IKEA doesn't provide repair services yet, this idea is currently being actively analysed and tested, according to what was shared by Interviewee B: "Of course, it would bring much bigger value if we could have repair services, but it is under analysis and testing in some countries now". As it was revealed during interviews, as the first step toward the repairing concept, IKEA provides

workshops in some of the stores, where customers can learn the ways to repair/upgrade their furniture. Also, some of the solutions for repairs are provided by IKEA for quite long time, thus spare parts are available in IKEA stores, which allow customers to repair the broken piece of furniture instead of discarding it immediately - "customer can go online and buy a spare part for a piece of furniture that is broken" (Interviewee B). The following advertisement campaign is used at IKEA website to encourage customers to repair: "Missing a leg for your sofa? Need an extra hinge? Spare parts big or small, we've got you covered. Repairing rather than replacing your furniture is great for the environment and great for your wallet" (Spare parts - IKEA website, n.d.). Moreover, some small parts such as plugs, knobs and screws can be found in IKEA stores or can be ordered online – both options at no cost. "When talking about prolonging the life pillar, we have solutions presented in our stores: for example, products with which one can paint, or repaint, or refurbish their furniture. Also, as you may know, we have small fittings and screws that can be used without having to pay anything" (Interviewee A).

When visiting IKEA store for direct non-participatory observation, inside of circular area a special corner was spotted, where through the big window customers can see how old furniture is being "reborn", as can be consulted in figure 5 of Annex B. "In this area remanufacture and refurbishment of furniture is happening" (Interviewee A). It was shared during the interview, that the main inputs are furniture from exhibitions and showrooms, which need to be restored to "like-new" condition and then it is released to be sold in circular area. Furniture that was sold with some defects and returned by the customer is also being recovered in this area along with creation of new products using different parts of dismantled products, than can no longer be restored.

Under the scope of the goal of being circular business by 2030, IKEA aims to produce zero waste. "Focus on waste management has two objectives: to reduce and to recycle" (Interviewee B), meaning that IKEA wants, as a first step, to reduce waste generation as much as possible. After analysing IKEA´s website, it became clear, that when new product is developed, IKEA tends to first use leftovers from other production and consequently some products are made only from surplus, which helps to reduce waste and amount of materials involved in production (Towards zero waste, for a better tomorrow - IKEA website, n.d.). Another example given during the interview was about all the textile surplus is being donated to seamstresses. As Interviewee A

declared: “All our textile surplus, we don't throw it away, we give to suing ladies and then they create some items and sell - they helped a lot of projects with the money”. Also, as it was mentioned in IKEA´s sustainability report, after adjusting meal plan at IKEA restaurants, food waste was reduced in 2022 by 50% in comparison with previous year.

Even with this effort being put on place “companies, especially big players in retail and manufacturing industry, they cannot live without making any waste, unfortunately, and IKEA is not an exception. So, we need to have ways to recycle, what we cannot reduce” (Interviewee A). Thus, IKEA dedicated to recycling, as a last possible option, as no compromise such as landfill or incineration is accepted, as it was shared in interviews. In this regard, it was clear from the information obtained through semi-structured interviews, that IKEA actively collaborates with partners and local authorities because recycling also depends on municipalities and private sector. Interviewee A highlighted: “Waste recycling doesn’t only depend on companies, it also depends on the country, on the municipalities, on the recycling infrastructures, also on the private sector, because most of the times this is a private business”. It is critical activity as turning waste into raw material is the key element for circularity and in one of the official interviews published online Stefan Manson, IKEA´s Material and Innovation Development Manager, stated: “We’re moving into a future, where waste is the raw material. It’s about designing from the bottom up and thinking in components”.

According to information obtained through interviews and official climate and sustainability reports, IKEA’ s goal is to have 100% of materials coming from renewable or recycled resources. At the moment, according to Interviewee A, the overall measurement is around 70%, where percentage of renewable materials is higher. Company actively works on increasing the rate of recycled resources, Interviewee B shared: “We want both to be the more or less the same proportion, because to have products made by renewable source means that resources from nature are still being used”. Recycling rate also depends on the material, as some are easier to recycle, then the others. Currently IKEA extracts wood just from certified forests, meaning they are also ensuring reforestation, but the dedication is to increase the amount of recycled wood. “Actually, we want to to raise the amount of articles made by recycled wood and our goal is to have recycled at least of 1/3 from all used wood by 2030” – shared Interviewee B. According to IKEA´s climate

report from 2022, company has reached 15% of recycled wood (IKEA Climate Report FY22 Introduction letter, n.d.).

After analyzing company´s website, it became clear, that IKEA is one of the pioneers in recycling fibreboard – products, constructed from wood that has been reduced to a fibrous state. Thanks to the new process IKEA can recycle it without losing quality or performance efficiency of material (Materials are key for becoming circular - IKEA website, 2023 n.d). Another input for IKEA's furniture and home accessories is plastic, at present stage company uses recycled plastic along with bio plastic. "We are using recycled plastic and bioplastic, however this is not possible to have 100% of bioplastic-based products – to make it possible half of the world would be producing bioplastic for IKEA, instead of agriculture and food etc. This is nonsense" (Interviewee A).
During the interviews, one more project released by IKEA was presented – creation of recycling facility for mattresses. The importance of this project is emphasized in a few official interviews of Caroline McGarvey, Material & Innovation Area Manager at IKEA, which were published online: "IKEA created a recycling facility for mattresses, and this is a fraction that is really complicated to be recycled because foam is a physical form of chemicals, and these chemicals are baked, just like bread is. We are doing it not only for IKEA, but for other players who have mattresses and need to recycle them, because we want to decrease cases when its burned or landfilled - it's extremely bad for the environment". So, as can be seen from citation above, IKEA is taking ownership and helps other companies and individuals to use appropriate method of disposal mattresses. According to the corresponding article, found in KEA´s website, during the process of recycling mattress is dismantled into components and all the materials, including foam pads, are used to manufacture new mattresses. IKEA aims to have at least 20% of recycled components in foam for mattresses by 2025 (On the road to circularity, mattresses matter – IKEA website, n.d.).

Along with mattresses IKEA also collects old pieces of furniture, while delivering new ones to extend their life, as it was learned on company´s website. At the moment it´s applicable for mattresses, sofas and electrical appliances, this service providing customers with facilities to behave with a circular mindset and extend value of their furniture (Pick-up service: when you need to free up space - IKEA website, n.d.).

After conducting interviews and analysing marketing campaigns of IKEA, it became obvious that IKEA is actively communicates to their customers possible options to prolong the lifetime of the furniture by the means of workshops and information present in the store along with examples of how products can be used for another purpose to extend their life, an example is referred in figure 6 of Annex B. Workshops provide useful information on how to repair damaged furniture as well as options of refreshing furniture that functions well. IKEA does creative advertisement to change perception of second-hand products and to promote "Buyback" project, as can be seen accordingly in figures 7,8 and 9, 10 of Annex B. What is more important, IKEA also inspiring customers to do, whatever can be done at home in terms of circularity. Thus, "the window in the circular area was exactly the idea of inspiring customers and send them a message: hey, we are not only asking you to prolong life, but we are also prolonging the life ourselves to avoid throwing away items that are still usable" (Interviewee B). Also, according to information obtained through interviews, company calls customers attention to the services they are providing: spare parts available, "Buyback" project, recycling services, circular hub with second hand furniture, etc., So if by any reason customers can not extend lifetime with own effort, they are aware of where to address it.

To enable transition from linear to circular business IKEA designed a plan, which includes circular loops and product design principles, that were integrated into the sustainability section of democratic design concept. Thus, interviewee B shared: "When we set the goal to be circular business, we started from product design and defined the IKEA Circular product principles to guide the team which develops the range. These principles have been integrated into the sustainability section of democratic design concept, and criteria has been set to guide team of product developers during the range development process". According to information obtained through IKEA´s website, in 2017 IKEA created the guide to design for circularity, where first draft of circular design principles was published as a first attempt to understand requirements for circular products and test it into practice. Second draft was published in the middle of 2018 after some pilot products were created and more understanding of circularity was gained from a practical point of view. Four circular loops, stated in the product design guide: reuse, refurbishment, remanufacturing and recycling are considered the instruments to retain the maximum possible value of resources, materials, spare parts and products as well as to extend their lifespan (Circular product design guide, n.d.).

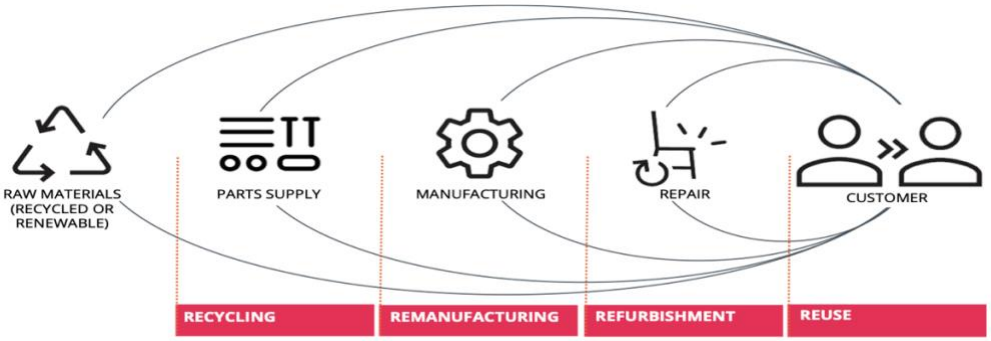

Figure 1 - Circular loops of IKEA

Source: Website of IKEA

The circular design principles according to IKEA are:

1. **Designing for renewable or recycled materials:** IKEA is committed to only use renewable and/or recycled materials to create its products as one of the main steps into transformation to a circular business. This principle is relevant for all four circular loops.
2. **Designing for standardization:** standardization is considered an important element for enabling circular economy as it allows modularity, meaning that it would be easier to reuse, repair, upgrade, refurbishment, remanufacture and recycle products and retain maximum value of products. IKEA obtains standardization by using materials and colours that are considered standardized. This principle is relevant for all four circular loops.
3. **Designing for care:** IKEA enables products with characteristics that simplify their daily care and maintenance and is considered an important criterion for ensuring long lifespan, minimizing possible deterioration of materials and components. This principle is relevant for the Reuse circular loop.
4. **Designing for repair:** according to IKEA need for repair should be addressed already on the stage of designing the product. By analysing relevant information, IKEA identifies the parts that tend to break more often and redesign it as well as offers relevant solution to repair broken parts or, when it's not possible to repair, to replace them. This principle is relevant for the Refurbishment circular loop.

5. **Designing for adaptability:** to extend to a maximum useful life of a product, IKEA makes sure that products are able to adapt to customers changing needs by modularity that allows adding, exchanging, or removing parts of the product as well as change form, functions, and design of the item. This principle is relevant for the Reuse and Refurbishment circular loops.
6. **Designing for disassembly and reassembly:** IKEA creates products that should be easy to disassemble and reassemble to minimize the risk of breakage while moving around as well as enabling easy division of parts in case they need to be repaired, upgraded, or replaced. This principle is relevant for the Reuse, Refurbish, and Remanufacture circular loops.
7. **Designing for remanufacture:** IKEA believes that existing products can be turned into future resources by designing for remanufacture. By virtue of designing for disassembly and reassembly usable parts can be easily separated from the old products and used while manufacturing of a new one, while designing for standardization helps in rational usage of material, chemicals, and other components. This principle is relevant for the Remanufacturing circular loop.
8. **Designing for recyclability:** IKEA carefully choosing materials and their combinations to enable recycling or up-cycling. This principle is relevant for the Recycling circular loop (Circular product design guide, n.d.).

It's crucial to pay attention on how the products are produced and create a strategy on minimizing the impact of production, but also understand what is going to happen to the products in their end of life, according to Interviewee A. It was highlighted on the interview: "On my opinion, to be circular the company should realize how the products are produced and to analyse the possible solutions to reduce the impact of it. But then also look at the end of the value chain and to see where the products are going to end, when customers don't need them anymore".

4.1.2. Enablers of CE practices implementation

As it was studied in IKEA´s Sustainability report, technology is vital aspect for IKEA in their transformation to circular business, as it's required for most of their circular solutions. It is needed

to transform waste into new material and IKEA actively explores new technologies and support new developments (IKEA Sustainability Report FY22, n.d.). “For example, “Buyback” project, when the customer wants to sell furniture back to IKEA, the customer has to go through the online platform and after all steps are completed, bot evaluates application in accordance with requirements and prevents situations when customers selling the products violating those requirements” (Interviewee B). Following data, found in IKEA´s sustainability report, by the end of 2023 it is expected that technological development of IKEA will be completed, and it will allow them to receive more accurate data on climate footprint of materials (IKEA Sustainability Report FY22, n.d.). One more enabler on IKEA’s way of transformation from linear to circular business is slight structural adjustment entailed creating of new job positions, that are in charge of circularity, which ensure more smooth and efficient transition, which was revealed during interviews.

As IKEA’s circular initiatives across their value chain is very diverse, they consider important to provide their employees with specified trainings on circularity, according to the executed functions. “We have specific training program, for example, how to design products with circular capabilities, because it requires certain knowledge and in some cases skills. However, there is no program for circularity as a whole because it won’t be relevant to people’s daily work, thus becoming fluffy” (Interviewee B). Despite the fact, IKEA doesn´t provide general trainings about circularity, it was clear from the interview, that they consider circularity trainings vital element for transition towards CE. According to Interviewees, IKEA enables active communication on circularity as a part of integrating circular mindset in the company. It’s important to IKEA to incorporate mindset of circularity in every part of value chain as it will facilitate scaling up activities.

After analyzing website of the company, it was spotted that IKEA considers collaboration essential element of circularity, thus, works closely with their suppliers, partners, non-governmental organizations to strengthen capabilities to improve their supply chain as well as collaborates with such organizations as European Furniture Industry Confederation, Euro Commerce, Ellen MacArthur Foundation to improve the circularity movement (The world’s first IKEA secondhand pop-up opens in Sweden - IKEA website, n.d.). As was shared during the interview, as a result of IKEA collaboration with local municipalities in Algarve, a new flow for composting was created.

According to Interviewee A, circularity is always a mix of solutions which works in complex and completes each other, thus it cannot be stated that IKEA is a circular business due to implementing recycling or because they use renewable resources, it's a sum of above-mentioned factors.

4.1.3. Barriers faced by IKEA in a way of circular practices implementation

Based on the data, collected during interviews, on the way of transition to a circular business some diverse challenges were identified by IKEA and one of them is lack of infrastructure for recycling/composting. For example, IKEA restaurants, even after the possible actions for waste reduction were taken, still produces small amount of organic waste which has to be composted and it requires special infrastructure, however not all the cities posses it. As was stated by Interviewee A: "For example, in Portugal, in Algarve, there was a lack of good infrastructure for composting, so we had to work along with the municipality, and they created this flow - not only for IKEA, but also for the shopping where we are integrated". Along with infrastructure for recycling/composting and repurpose of materials require partnership due to complexity and cost of these processes, it was shared by Interviewee B: "Developing the infrastructure necessary for recycling and repurposing materials is a complex and expensive process. This cannot be achieved alone. We need to invest heavily and collaborate with local governments and companies". According to the data obtained in the interviews, on IKEA´s way to the goal of having 100% of renewable and recycled materials, it was found out that not all materials have renewable or recycled alternatives or in some cases where alternative exists the production capacity is limited. Furthermore, "for some materials, there is still technical gap for using 100% recycled while keeping the same quality level, for instance, metal" (Interviewee A).

As it was already discussed above, technology is one of the key elements in transition to circular business, because it is needed to track lifecycles and optimize circular operations and for many other purposes. As per data obtained through interview, IKEA finds that in some cases development of the effective technology and implementation it into production is challenging.

As IKEA has wide range of products and they aim to have all the products with circular capability by 2030, "to improve the circular capabilities for all of them time is needed, as well as investment on the production line in the supply chain" (Interviewee B).

However, one of the biggest challenges for IKEA is immaturity in terms of circularity which leads to the lack of demand on circular products and services in some markets. "Companies struggle to offer circular services and products, and this is a path that we have been crossing. This is a huge work on change of mentality and to have the world prepared for circular services and products" (Interviewee A). It's inevitable, that customers are inalienable part of circular journey: "We can inspire, engage, and encourage customers to use and treat the products in a more circular way, but it's the customers that make the final decision. We must make it easy, convenient, and affordable for customers to take action and be part of the journey" (Interviewee B). Finally, IKEA as the international manufacturer and retailer, operates in many countries and generally circular economy is regulated by polices and legislation that varies from region to region and, according to both interviewees, it is challenging to follow it.

4.1.4. Achievements of IKEA in the way to circularity

IKEA's major goal to be circular business by 2030 can be divided by few smaller goals. One of them is to have 100% of products produced from renewable or recycled materials. As per information received from IKEA´s Sustainability Report, at the moment IKEA reached 60% for renewable materials and 13% for recycled. In 2020 IKEA managed to reach the mark of 90% recycled components in textile products from polyester. In 2021 it was decided to widen the scope of measurement to all polyester and fiber applications, including filling in cushions, duvets, sofas, mattresse and similar products, but excluding rigid plastic. In 2022, considering the new measurement system, 88% of the polyester in the supply chain was recycled (IKEA Sustainability Report FY22, n.d.).

In 2020 IKEA reached the mark of 98% of FSC-certified or recycled wood used for its products, in 2022 company achieved a milestone of 100% in this dimension, with approximately 15% of

recycled wood and now IKEA actively works in increasing percentage of recycled wood in production (IKEA Sustainability Report FY22, n.d.).

In regards of circular areas and stores, following information retrieved from IKEA's website, in 2019 IKEA gave a second life to 47 million products, 38 million products were resold through circular area and around 9 million products have been repacked back to the shelf. This can be translated into saving of 151 tones from being considered as waste and avoiding around 90% of CO2 emissions in comparison to buying new products (IKEA secondhand store in Sweden now extended until August 2025 | IKEA website, 2023). Also, according to website, IKEA provided more than 21.5 million of spare parts to its customers in 2022 to empower them prolonging products' lifespan and this measurement increased for 3.5 million compared with previous year (IKEA Sustainability Report FY22, n.d.). Another fact found on the website of the company - in 2022 IKEA was one of the first businesses to disclose its air pollution footprint across a value chain and during 27th conference of the parties on UN Framework Convention on climate change company launched first-ever guide on measuring air pollution across value chain. The guidance is a result of IKEA's collaboration with Stockholm Environment Institute (SEI) and Climate & Clean Air Coalition (CCAC) and it is available for all the companies (A practical guide for business: air pollutant emission assessment | climate & clean air coalition, n.d.).

Environmental results of IKEA are measured in climate footprint and KEA's value chain issued, according to the climate report of the company, 25.8 million tonnes CO_2 eq. in 2022, with a decrease of 5% compared to 2021 and 12% less compared to baseline. As it was revealed during the interview, in scope of climate footprint IKEA includes all type of emissions "production and operations, but also value chain streamlines from suppliers to customer homes as well as the end of the life of a product" (Interviewee A). The principal sources of emissions are illustrated in the chart.

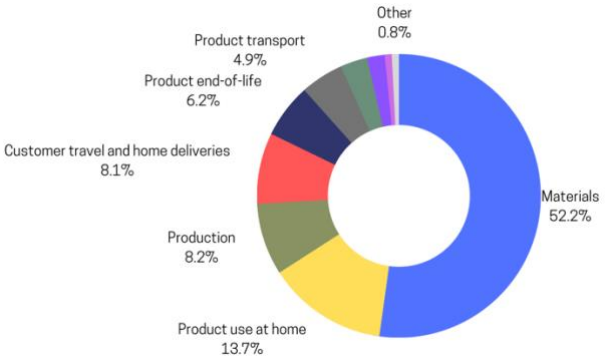

Figure 2 – Sources of CO2 emissions in IKEA

Source: obtained through IKEA's documentation analysis

According to sustainability report of company from 2022, in the mentioned year IKEA increased ratio of renewable electricity in retail and operations for 5% compared to 2021 and reached 76%, with 24 retail markets, that are operated on 100% renewable electricity. In production the share of renewable electricity reached 64%, which increased for 12% compared to 2021. In regards of product deliveries, IKEA also takes necessary actions to minimize waste and air pollutions, thus for more than 10 years company collects packaging materials for further reuse. Along with that action, IKEA replaced wooden pallets with paper ones which increased a possible number of products to be delivered in one shipment and eliminated a need to return empty wooden pallets back. The outcome of the taken actions is around 50.000 less trucks on the road and thus less CO2 emissions (IKEA Sustainability Report FY22, n.d.).

4.2. Discussion of data

The main objective of this study was to analyze how the circular practices implementation occurs in furniture manufacturing industry on the example of IKEA – company that is considered world's largest furniture retailer and manufacturer and currently is in active phase of shifting to circular economy. To fulfill the main objective a few aspects should be explored, specifically: what are the practices implemented in the company, what are the barriers and enablers of CE practices implementation are faced on the way of IKEA and which results company has achieved.

The collected empirical data showed that IKEA actively uses R-practices in its operations. Thus, for example, such projects as circular or, so called, "Second life" zones and stores, where second hand furniture and home accessories are being sold, along with "Buyback" project, which designed to give the possibility to IKEA's customers to sell back furniture that is no longer in use, are considered an evidence of **reuse** practice implementation.The main goal of above-mentioned projects is multiple usages of products to ensure their value retention as well as guarantee decrease of the amount of resources used in manufacture, consistent to what was described by Su et al. (2013) and Grafström & Aasma (2021). Furniture repairs workshops that IKEA provide to pass the knowledge to the customers as well as providing spare part services and free fasteners are clear signs of **repair** practice implementation. This practice was described by Gaustad et al. (2018) and Pan et al. (2022) as actions taken by different actors to support or recreate original functions of the item with the purpose to extend it life. Implementation of **refurbishment** and **remanufacturing**

practices can be spotted right in IKEA store, inside of circular area, where through the big window can be observed how new products can result from a transformation of old items. The actions that IKEA does are coherent with description of remanufacture and refurbish practices by Reike et al. (2018).

According to Kabirifar et al. (2020) **reduce** practice implies lower input of primary raw materials and energy used for production, as well as amount of waste, which matches IKEA´s effort to utilize leftover from previous products when creating new ones or donating those resources that are not useful for IKEA anymore. Evidence of implementation of product service system as a part of **re-servitization** practice, that was described by Barreiro-Gen & Lozano (2020), is project where IKEA rent furniture instead of selling it.Creation of recycling facility for mattresses implies implementation by IKEA of a few practices: **recycling** and **extended producers responsibility** practices. The latest, as it was described by Gaustad et al. (2018), means full or partial manufacturer's responsibility for end-of-life management of a product, which illustrates IKEA's actions of taking ownership of old mattresses – one of the most common types of waste to be sent to landfill. Recycling practice, according to Su et al. (2013), aims to transform waste materials into the equal or different product or component and IKEA, on the example of mattresses recycling, uses all the materials, including foam pads, to manufacture new mattresses.

Along with mattresses IKEA also collect old pieces of furniture, while delivering new ones and later recycles it. At the moment it´s applicable for mattresses, sofas, kitchen and electrical appliances (Pick-up service: when you need to free up space - IKEA website, n.d.). and is considered evidence of **reverse logistics implementation**, which was described by Ding et al. (2023) as logistics going to the opposite direction: from the place of consumption to retailer or manufacturer to ensure further products´ value retention. IKEA creates its products according to circular design principles, which is evidence of implementation of **designing products for circularity** practice. Manufacturing products for circularity enables products with circular capabilities from the very beginning and thus facilitates their further reuse, remanufacturing and recycling which is coherent with findings of Grafström & Aasma, (2021) and Khan & Haleem, (2021) who claimed that designing products for circularity is one of the most essential practices of CE, as products gain circular capabilities from the moment they are created. IKEA does a great effort to pass the message on importance of circularity to its customers – it was evident when

visiting IKEA stores for direct non-participative observation, because **customer awareness** is one of the practices needed to create new consumption patterns and increase demand on circular products, according to Khan & Haleem (2021).

Cooperation and collaboration, in its turn, are considered by IKEA as enablers of circularity, which allow to improve circular capabilities of business. Thus, IKEA´s collaboration with municipalities resulted in creation of composting infrastructure in Algarve. IKEA also collaborates with such organizations as European Furniture Industry Confederation, Euro Commerce, Ellen MacArthur Foundation to improve their circularity movement. Gedam et al. (2021), stated that collaboration with customers and partners is a key to CE practices implementation. Another enabler of CE practices implementation is specialized **training on circularity,** that IKEA provides to their employees, engaged in development and production of products with circular capabilities to ensure they posses all the necessary knowledge and skills. This proofs idea of Khan et al. (2021), considering training as instruments for align goals and circular vision of company. It's important to IKEA to incorporate **mindset of circularity** in every part of value chain as it will facilitate scaling up activities and thus enables transition to CE. It is coherent to Hofstetter (2021), who stated that changing organizational mindset to circular is a crucial factor to implement circular economy practices.

In the interview it was revealed that transition to circular economy became possible in a large extent due to **technologies** - it is required to track lifecycles and optimize circular operations, to turn waste into new materials and products and to support functionality of projects. IKEA adopts new technologies to enable implementation of CE. According to IKEA´s Sustainability Report, by the end of 2023 it is expected that technological development will be completed, and it will allow IKEA to receive more accurate data on products lifecycle and climate footprint of materials. Findings of Schöggl et al. (2023), also shows that technology improves process of collection and aggregation of products' data and enable monitoring of products´ and spare parts´ lifecycle.

One of the barriers that IKEA faces on the way of shifting to circularity is customers' **unawareness and immaturity** in some regions. Thus, it becomes challenging to offer circular products and services. Hina et al. (2022) found that customers are expected to cooperate to ensure maximum value retention of products and lack of their awareness leads to lack of cooperation. To overcome

this barrier IKEA actively increases awareness of their customers about circularity through advertisement. As it was clear from the interview, another barrier that IKEA encounters is **lack of infrastructure** for recycling and composting in some regions. The same is considered a barrier towards CE as recognized by Grafström & Aasma (2021), as it obstructs transformation of waste into material for new products, consequently, provokes creation of waste, which is placed in landfill. IKEA also faces **regulatory barrier** because as the international manufacturer and retailer, operates in many countries. Policies and legislation, by which circular economy is regulated, varies from region to region and navigating those differences is considered challenging which supports findings of Hina et al. (2022). Finally, IKEA posses a wide range of products that has to be enabled with circular capabilities and thus demanding huge investments, which can be sees as **potential economic barrier.**

5. CONCLUSION

The research question of the current study is **How are circular economy practices implemented by IKEA?** The principal objectives are in-depth understanding and description of CE practices implemented by IKEA; exposition of main barriers and enablers of CE practices implementation faced by IKEA and description of the main results that IKEA has been achieving with adopting CE practices.

This study uses semi-structured interviews, official interviews of IKEA´s employees, published online, analysis of documentations, and direct non-participatory observation to collect the data. Relatively the first objective of this study, the findings showed that IKEA has implemented majority of CE "R" practices, such as reduce, reuse, repair, refurbish and remanufacture, recycle and re-servitization practice, which are according to Reike et al. (2018) most common CE practices. IKEA also implemented practices of designing products for circularity, reverse logistic, customer awareness and extended producer responsibility. These practices are identified by Khan & Haleem (2021) as crucial CE practices.

Referring to second objective of the study, IKEA considers collaboration with their customers and cross-sectoral collaboration, customer education, circular mindset integration, technology, and trainings as enablers of shift toward CE. These factors are considered critical for transition to CE (Hofstetter, 2021; Khan et al.,2021). Regarding the barriers that IKEA faced during CE practices implementations, this study identified lack of infrastructure for composting and recycling, need of technologies, lack of customer awareness, economic and regulatory barriers. These barriers were also identified by Grafström & Svensson (2021) and Hina et al. (2022). During the process of transition to CE, IKEA faced another barrier - not all materials have renewable or recycled alternatives, or, in some cases, alternative exists, but the production capacity is limited, which makes the process slower and more complicated.

Following third and last objective of the study regarding results reached by the company, in 2019 IKEA saved around 151 tones of furniture from appearing in waste, by giving it second life by the

means of CE practices and thus avoiding around 90% of CO2 emissions in comparison to buying new products. Along with that IKEA reached the mark of 73% of renewable and recycled materials used for manufacturing of their products. Furthermore, in 2022 company hit the target of 100% of FSC-certified or recycled wood used in manufacturing. Also, in 2022 IKEA reached 76%, of renewable electricity in retail and operations, having 24 retail markets, that are operated on 100% renewable electricity. In production the share of renewable electricity reached 64% at the same year. Main ecological results achieved by IKEA by 2022 is reduction of 12% footprint, comparing to baseline and 6% reduction in comparison with 2021.

Current work was carried out with a few limitations: firstly, one of the limitation is the number of interviews – it was possible to arrange only 2 interviews. Furthermore, the data would be more completed if it would be possible to interview employee directly involved in product manufacturing functions. Taking into consideration IKEA is multinational retailer and manufacturer, employees from specific countries might not have data that reflects full picture of the global IKEA chain.

For further investigation it would be interesting to do similar research for company that completed transition to circular business and thus possess more complete information about that transition. This study contributes to a more detailed understanding of how circular economy practices are implemented in furniture manufacturing industry on the example of IKEA, as biggest retailer and manufacturer of industry. It allows to understand what factors are essential while shifting to circular economy, what are the potential barriers that company might face and be aware of the ecological benefits received from CE implementation and thus facilitating transition from linear to circular economy in furniture manufacturing industry.

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ANNEXES

Annex A - Interview guide

My name is Karyna Kruk and currently I´m developing my final master´s thesis in Management and Industrial strategy at ISEG. The goals of the thesis are are in-depth understanding of CE practices implemented by IKEA; exposition of main barriers and enablers of CE practices implementation faced by IKEA and description of the main results that IKEA has been achieving with adopting CE practices.

First of all, I want to thank you in advance for participation in this interview, because it will contribute to a great extent to the development of my master´s thesis.

Present interview will consist of several open questions, which you can consult in this interview guide. Please, keep in mind that there are no right or wrong questions, I just would like to hear your opinion, based on your experience at IKEA.

If you give your consent, this interview will be recorded with the goal to ensure that the data extracted from the interview is complete and consistent. The duration of this interview is approximately 60 minutes. Also, I want to ensure you that the information provided in the interview will be treated only by me and only with the purpose of developing thesis, your personality can stay anonymous if you wish so.

To start with I would like to present the definition of circular economy. According to Kirchherr et al. (2017) “Circular economy describes an economic system that is based on business models which replace the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations”

- Do you agree with this definition of CE? If not, could you share the understanding of CE concept according to IKEA?
- At your website it says: "At IKEA, our ambition is to become circulate by 2030. We will design all our products to have circular capabilities from the beginning" what actions do you do to achieve this goal?
- What are the challenges faced so far?
- From which country you have started the transformation to a circular business? Why?
- What are the CE practices that have been implemented by now?
- According to IKEA's experience, do you consider some of CE practices more effective than the other? Why?
- After some research we can notice that IKEA mainly emphases reuse (IKEA 2nd hand store), refurbishment remanufacturing (special departments in IKEA where you can see how furniture is "reborn") and recycling practices, could you share why?
- IKEA is one of the pioneers in transition to CE in furniture industry, having this in mind, could you share some best practices which are crucial for CE practices implementation?
- Did any structural, technological or cultural changes happen in IKEA to facilitate implementation of CE practices?
- Does IKEA have a specific training program to support the implementation of CE practices?
  (If yes) How does the program influence implementation of CE practices?
- To implement circularity to business, collaboration with the customers is important, how do you educate your customers in regards of importance of circularity?
- Which other stakeholders outside the company participate in the transition of IKEA to a circular business?
- Could you share more details about circular product design principles that help IKEA to create circular products?
- What are the characteristics of circular product according to IKEA? How do you assess circularity of your products?
- What environmental results (ex. Reduction in resources used/ reduction of emissions) have been achieved so far by implementing circular practices?

Annex B – Evidence of CE practices implementation in IKEA

Figure 3 - Circular Area in IKEA store in Alfragide.

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Figure 4 – Labels for "Second Life" products.

Figure 5 - Remanufacturing & refurbishment zone in IKEA Alfragide.

Figure 6 - Advertisement promoting repurposing of IKEA items.

Figure 7 - Advertisement of second-hand furniture at IKEA (1).

Figure 8 - Advertisement of second-hand furniture at IKEA (2).

Figure 9 - Advertisement promoting IKEA´s "Buyback" project (1).

Figure 10 - Advertisement promoting IKEA´s "Buyback" project (2).