The Circular Economy and Its Effects on Reducing the Carbon Footprint in IKEA Company

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Abstract

While it is important to encourage industry, and in particular its companies, to reduce their carbon footprint, there is still little knowledge of the practices that need to be followed to achieve this. Even though companies are changing and are willing to shift step-by-step from their linear production model to a new circular economy paradigm (Kapsalis et al., 2019; MacArthur, 2012), there is still little information on how to implement such a paradigm. The present study aims to fill this gap using the IKEA family business circular economy model, which has been internationally recognized and applied in several countries for maximum ecological performance(Szerakowski, 2017). Analyzing the circular economy model of this multinational will help to identify carbon footprint reduction strategies to be followed in similar industries, but also in other types of industries. The fact that IKEA is particularly a family business, although it is also a multinational one, makes us think that the so-called socio-emotional wealth of family businesses and their interest in how to pass control of the business to the next family generation in the best way makes these companies different from the generality of companies and they are probably more willing to implement systems and practices to reduce their carbon footprint and thus leave the environment in the best possible way to the next generation.

Keywords: Circular Economy, Carbon Footprint Reduction, Environmental Sustainability, Case Study, Sustainable Economic Growth, Family Business.

1. INTRODUCTION

Corporate social responsibility is becoming more widespread to achieve sustainable economic and industrial growth. While it impacts the economy in three ways: social, economic and environmental, it is on the latter side that we focus on this study(Pakulska, 2018) and on the carbon footprint reduction strategies of business and industry, as it is fundamental to making this world more liveable (Lee, 2011; Penz and Polsa, 2018; Carvalho et al., 2016). In this sense, given the link of sustainability with passing on the world to the next generation in equal or better environmental conditions, it seems that family businesses can become excellent examples for

others to follow and make this world better from an environmental point of view(Díaz-Moriana et al., 2020).

On the other hand, the green economy, reducing the carbon footprint and achieving environmental sustainability require a paradigm shift in the production model of companies and industries. The circular economy can help in this regard (Bonviu, 2014; MacArthur, 2012), as it is a sustainable and environmentally friendly type of model(MacArthur, 2012; Lewandowski, 2016), which governments strongly encourage due to the long-term benefits likely to be obtained in terms of pollution reduction and energy efficiency.Thus, the linear economy model follows the following steps: 1) extraction of raw materials, 2) refining, 3) transformation into parts, 4) assembly and transformation into final products, 5) sale and use for a time and 6) conversion into waste, which generates a waste of resources and creates a problem of pollution and energy waste (fueling global warming with a large carbon footprint).

However, the circular economy model is about designing products in such a way that they do not become waste and can be upgradable, repairable. In other words, the circular economy model aims to ensure that the life of products can be extended, including in the form of raw materials for new products, which means a smaller carbon footprint and less energy consumption for business and industry.

The green economy, carbon footprint reduction and the achievement of sustainable development pursued by the circular economy require disruptive changes and innovations. An integration between sustainability and business development is more and more necessary(Ritzén and Sandström, 2017) and requires the development of novel goods, services and management methods that result in a reduction of negative impacts on the environment. This is what Kemp and Pearson(2007) have called eco-innovation.

Despite all this, the deficiencies in the capacities of manufacturing companies to execute circular economy business models are delaying their implementation and require studies that identify the main factors that favour and accelerate their implementation (Pieroni, et al., 2021). On the other hand, despite both the growth of the Circular Economy literature in the last decade and the variety of existing approaches, these are limited in providing adequate advice to practitioners regarding their implementation (Lahcen et al., 2022; Zhu, et al., 2022).

The aim of our research is twofold. On the one hand, the aim is to analyse how a particular company has managed to implement a Circular Economy model and, on the other hand, whether the family character of the company has had an influence on this. In order to achieve this, firstly, the concept and principles of the circular economy have been explored in depth and various models have been presented. Secondly, based on the socio-emotional wealth approach, we have identified certain factors that may favour the implementation of this model. Thirdly, before the methodology used had been explained, a first research question we ask ourselves is whether IKEA is family-printed despite being a huge multinational company. The case of the IKEA company was presented as a family company that is faithful to the principles of its founder and therefore wants to be at the forefront of environmental preservation, reducing its CO2 footprint and above all, leaving a better world for future generations. In this section we have incorporated IKEA's principles and values, the main figures that describe the company's situation, the strategies and tactics carried out by the company that demonstrate that the company is adapting to the new paradigm of the circular economy, and finally, we have shown the results that the company has achieved in this respect. The last part of the paper presents the conclusions reached and the practical and useful implications for professionals. Finally, all the references we have used are listed.

2. CIRCULAR ECONOMY

The circular economy is now a popular concept promoted especially by the European Union, by some national governments such as China, Japan, the United Kingdom, France, Canada, the Netherlands, Sweden and Finland and by many companies around the world.

The concept of circular economy has been gaining traction since the late 1970s (MacArthur, 2012) and the introduction of the concept is credited to Pearce and Turner (1990) although it was earlier. The linear model began with the industrial revolution in the 17th century and ignored the limitations of the environment and the damage that this system could cause in the long term (Prieto-Sandoval et al., 2017). Companies take re-sources from the environment and then transform them into products and services. They then distribute them to consumers at points of sale or to other companies to be used. And this is where the circular economy proposes to close the loop by recovering and enriching already used materials instead of throwing them away (Stahel, 2016). In this way, the Circular Economy is understood as a regenerative system in which resource input and waste, emissions and energy leakage are minimized, slowing down, closing and tightening material and energy loops. A circular economy is one that is restorative and aims to keep products, components and/or materials at their maximum utility and value always (Geissdoerfer et al., 2017).

As can be seen, circular economy thinking is not new, although it has recently generated more attention from the business community (De Angelis et al., 2018). One of the causes for this is the worsening of the environment. Biodiversity loss, water, air and soil pollution, resource depletion and land overuse have led to increased environmental awareness (Rockstrom et al., 2009; Jackson, 2009; Meadows et al., 2004; McLellan et al., 2014). On the other hand, socio-economic and regulatory changes have encouraged companies to attach greater importance to this issue. In recent years we have seen how the growth of modern economies has led to greater volatility in resource prices, the rental economy has increased, and we have witnessed an increase in regulatory pressures on climate change and waste management.

All these developments and concerns have led to numerous studies focusing on aspects such as the concept of the circular economy itself (Prieto-Sandoval et al., 2018; Kirchherr et al, 2017), circular business models (Minunno et al., 2020; Bocken et al., 2014; Lewandowski, 2016), in the taxonomy of reduce, reuse and recycle (3R)(Sihvonen and Ritola, 2015), in value creation along the supply chain (Mangers et al., 2022, De Angelis et al., 2018; Schenkel et al., 2015) or in the relationship with sustainable development (Prieto-Sandoval et al., 2018). However, the scientific and research content that can be found is in most cases superficial and messy, and there are certain aspects within this thematic largely unexplored (Korhonen et al., 2018).

3. THE IKEA CASE: A FAMILY BUSINESS IN THE MIDST OF TRANSITION FROM THE LINEAR ECONOMY TO THE CIRCULAR ECONOMY

3.1. Family Business and Sustainability

In the family business we find an overlap between the business and the family; its members participate simultaneously in both systems, both in the business and in family relations. This means that family businesses prefer objectives that are not necessarily economic. Aspects such as reputation, loyalty, belonging or status and security or even altruism have a place in family businesses (Nicholson, 2008). This is true in our case study that we are presenting.

Traditionally, the theoretical framework used to explain this situation has been the resource-based view (RBV) (Barney, 1991), in which family involvement is conceived as a resource that contributes to creating a competitive advantage for the company through the development of tacit knowledge and high social capital (Sirmon and Hitt, 2003).

Despite this, different authors have highlighted the need to incorporate more beneficial approaches that help us to better understand the behavior of the family business and even the possibility of integrating theories from other disciplines, such as psychology(Pieper, 2010). For this reason, the Socio Emotional Wealth (SEW) theory was developed(Gómez-Mejía et al., 2007), which finds the justification for a different behaviour of family businesses for three main reasons. Firstly, because emotions are considered in the company-family relationship; secondly, the family's own values, such as responsibility, commitment, unity, etc., condition their behaviour(Gómez-Mejía et al, 2007; Miller & Le Breton-Miller, 2006); and thirdly, altruism

motivates family businesses, generally immersed in their community, to preserve their image and reputation.

Within this theoretical framework, family businesses would be justified in behaving differently from non-family businesses because their decisions are not dominated solely and exclusively by economic factors and justifies this greater social commitment. Recent work such as that carried out by Núñez-Cacho, et al. (2018) determines that family businesses behave differently when faced with environmental sustainability.

All this SEW, together with the desire that this type of company must keep the business in the hands of the family, continue its legacy and feel proud of its own family name (Pieper, 2010), favours and encourages the family business to move from a system of traditional pro-duction to a more sustainable production and, therefore, towards a circular economy (Nuñez-Cacho et al., 2018).

In this paper, we understand that SEW is a key factor that leads family businesses to be-have differently from other types of businesses and has an impact on the way they deal with environmental sustainability. SEW acts as a trigger that accelerates the implementation of the circular economy in family businesses (Nuñez-Cacho et al., 2018).

3.2. Is it possible to consider IKEA a family business?

It all started in Samaland, a small town in rural Sweden, where founder Ingvar Kamprad was born. In those lands, people manage to live simply and with little means. It is the ideal context for the IKEA concept of maximum efficiency, achieving the maximum with the minimum, to be born. With this way of working and conceiving the business they can keep prices low.

In the year of IKEA's foundation, Sweden starts to stand out for a more social vision in which people are cared for equally regardless of their wealth or poverty. This context helps to create a certain culture that will take hold in the company. Originally IKEA sold everything that could make life better if it were reasonably priced. The wide variety of products for the whole family ranged from pens, wallets, frames, watches, jeweler and nylon stockings. Everything Ingvar thought people might need. The only condition was that it could be bought at a low price.

In fact, it was not until 1947 that furniture began to be introduced among the products offered for sale, and it was in 1951 that the famous IKEA catalogue was published for the first time, offering furniture at very affordable prices. It was in this year that the IKEA concept was brought closer to that of today.

From IKEA's way of doing business, a truly original way of doing things can be deduced. In short, a culture that innovates cheaply, that learns by trial and error. The most remarkable thing is that it has been concerned from the beginning to be faithful to its values of commitment to society, the environment and, in short, to sustainable development in which social responsibility stands out as an objective over the pursuit of business profit. This does not mean that it should be renounced. It is an original way of looking at things.

The founder's philosophy has always remained, even if Ingvar Kamprad was no longer in control of IKEA. Today, the code of conduct Inter (IKEA, 1976) promoted by the founder, the values and his business concept remain. Thus, Ingvar's expressions such as: "There is no more effective method than setting a good example", "The fear of making mistakes is the root of bureaucracy and the enemy of evolution", "The feeling of having finished (a task) is the most effective sleeping pill", can be heard in every corner of the company. The founder's culture still permeates his way of doing things. His successor as CEO Anders Moberg (who replaced Ingvar Kamprad) used to drive to work in a company Nissan Primera, dressed casually, and even clocked in like other employees. When he travelled, he travelled economy class and stayed in modest hotels. In this way he set an example for all executives in the company to do their day's work in the same simple and austere way without detracting from their efficiency. This exemplary leadership from

the top down is transmitted throughout the company.This leads us to underline that the company's vision is: "To create a better everyday life for the many people". This sentence is accompanied by a picture of a mossy stone with the comment "Classic Småland stone wall, a true symbol of longevity and our heritage".

If we want to see the whole philosophy of the company, it is best to look at the document called the testament of the founder Inter IKEA(IKEA, 1976) which he himself called "The testament of a furniture dealer". It consists mainly of a letter of introduction and a series of sentences leading to an explanation that together form the business that has made IKEA successful. Based on this statement and following Chua,Chrisman and Sharma(1999) we can consider the company as a family business, and everything stated in the previous point about the propensity towards social responsibility and especially the circular economy based on the SEW would be attributable to our company under study. Not precisely because IKEA has the necessary components to be considered a family business (i.e., number of members of the same family, percentage of ownership, management positions of family members, etc.), but because its very essence is family. A company is considered family oriented when the behaviour of the people who own and/or govern and/or manage the company, do so to serve a specific purpose and pursue the vision of one or a few families, as in the case of IKEA. Thus, embodying the notion of a better future not only for the family, but for society at large(Chua et al., 1999).

However, the owner of the company is not the family directly as in other traditional family businesses, it is the Interogo Foundation is a business foundation (Unterneh-mensstiftung) with legal personality under Liech-tenstein law. The main purpose of the Interogo Foundation is to ensure the independence and longevity of the IKEA Concept as well as to own and govern Interogo Holding and Inter IKEA Group.

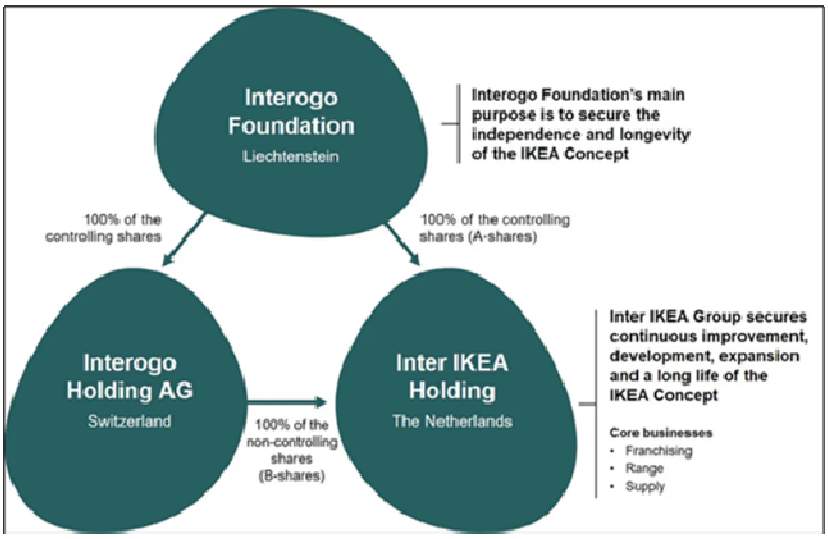

FIGURE 1: Who is currently the owner of the company.

The Interogo Foundation takes care to follow the founder's mandates and will also maintain a financial reserve for rainy days when the IKEA concept of simplicity and efficiency is ever in serious trouble.

3.3. Methodology used and the choice of the IKEA company as a case study

The literature suggests that the research methodology chosen will serve to solve the problems and issues being analysed and will depend on the state of development of the area of knowledge (Eisenhardt, 1989; Pettigrew, 1990). The case study is appropriate for this work because it fully satisfies Yin's (1994) premises. Firstly, this paper aims to test a theory that specifies a set of outcomes in a specific situation, and furthermore, a company has been identified in this situation.

IKEA can be understood as an outstanding example of a family business and the implementation of the circular economy, which also has a series of specific characteristics that have made it practically unique in the way it has developed this model. This means that a more in-depth study of the company's implementation of these tactics will not only improve environmental management but also the company's competitiveness. The case of IKEA would prove that upholding the founder's values incentivises its social and environmental commitment and could be a critical test of the theory and its applicability to the organization. Second, case study methodology is an empirical research method that analyses a contemporary phenomenon in a real context using different sources of empirical evidence. This type of study should not be seen as a global analysis of the company, but as a study that focuses on a specific issue (Noor, 2008). It is rare to have a model in place that is so aligned with the principles of the circular economy, so this is the main aspect to be studied in IKEA. And finally, as Patton (1987) points out, the use of this type of research method is justified by the great usefulness of analyzing a complex and little-known phenomenon at the time of the study and expects to learn something new and important. In this sense, IKEA would also fulfil this premise. The IKEA company, with the implementation of a circular economy model so deeply rooted in its DNA, has brought about a profound transformation not only in the company but also in the society in which it operates and has helped it to achieve a privileged position within its sector. In the case of IKEA, we find sufficient justification based on these three issues: it is a sufficiently unique company to be a benchmark for other companies; it implements a circular economy model based on environmental principles that is not common among current companies and obtains very significant results; and finally, there is a great lack of knowledge in the current literature on how companies implement this type of management model.

The collection of information has been done in a combined way, on the one hand we have gone to the information published by the company, but not blindly. It was guided by staff from the communication department and the company's own social responsibility department. There is a lot of material published by the company and the participation of the company's own staff was very important in order to get lost.

To measure the applicability of the model, we collected relevant information from the company through various mechanisms and from different sources (Campopiano and De Massis, 2015), which was subsequently analysed and used to identify the main factors that have favored the implementation of the circular economy model. The content analysis was carried out by the different authors of this work in order to obtain information that was not available a priori and thus avoid the recall bias typical of interviews (Barr et al., 1992). Table 1 below shows the sources and documents from which information was obtained.

TABLE 1: Material analysed for the case study.

– The Testament of a Furniture Dealer
– IKEA Sustainability Report 2019
– IKEA Sustainability Report 2020
– Balance sheet and annual accounts 2019
– 2020 Balance Sheet and Annual Accounts
– Interviews with communication staff
– Interviews with the Corporate Social Responsibility department
– News published in the press

4. RESULTS OF THE RESEARCH

4.1 Sustainability policy: the commitment to a circular economy

IKEA is a large group with incredible accounts and figures as we shall see. We can imagine that all of this generates an enormous carbon footprint that needs to be reduced if we want to make a sustainability policy that prioritises the transformation from a linear economy to a circular

economy model. To get an idea of the company we are talking about, let uslook at data from 2020 (IKEA, 2020) and Ingka Group (Ingka Holding B.V. and its controlled entities) (2020):

- Turnover this year was more than 39.6 billion euros (despite the pandemic).
- The number of employees worldwide exceeds 217,000 in 445 warehouses in 60 different markets.
- This makes it possible for more than 1 billion customers to visit its shops.
- In addition, there are more than 3.6 billion virtual visitors to its website. (9.4 million times the IKEA app has been downloaded).
- Customers have the possibility to shop from its extensive catalogue of more than 9,500 products.

In general terms and in terms of sustainability we can highlight:

1) IKEA Clean Energy Services sales in 11 countries grew by 90% and the community of clean energy producers and consumers accumulated savings of more than 10 million euros and 63,000 tonnes of CO2.In short, if any company is considered an important player in promoting positive change in society it must be IKEA.
2) It has managed to give a second life to 39 million reclaimed products. 30.5 mil-lion products were resold through the "As-Is" shop, and more than 8 million products were repackaged and sold at affordable prices, saving CO2 for the planet and money for citizens.
3) IKEA has invested in 547 wind turbines and 2 solar parks in 14 countries and has 935,000 solar panels on the roofs of its shops and warehouses.

IKEA has a vision - to create a better everyday life for many people - and right now they see this as more relevant than ever. The company has a great purpose in mind, to have a positive impact on people and the planet and to contribute to wider changes in society. Actions speak louder than words, and the aim is to demonstrate this with deeds. So, by 2030, the big ambition is to transform the company into a circular and climate-positive company. To achieve this, the company will promote the use of sustainable materials and reduce greenhouse gas emissions more than the IKEA value chain emits, to contribute to limiting the global temperature increase to 1.5°C by the end of the century. This high ambition is broken down into (IKEA, 2020; p. 22):

1) Transforming itself into a Circular Business and becoming itself climate positive.
2) Regenerating resources, protecting ecosystems and enhancing biodiversity.
3) Creating a movement in society around better everyday living.

Figure 2 shows that the growth in sales does not imply a corresponding increase in CO2 tonnes or even a decrease, as we can see from 2018 onwards. This is clear evidence that the overall sustainability policy and the implementation of the circular economy at IKEA is bearing positive fruit. This reaffirms that we have chosen the perfect company to be paradigmatic in terms of the transformation from a linear to a circular economy.

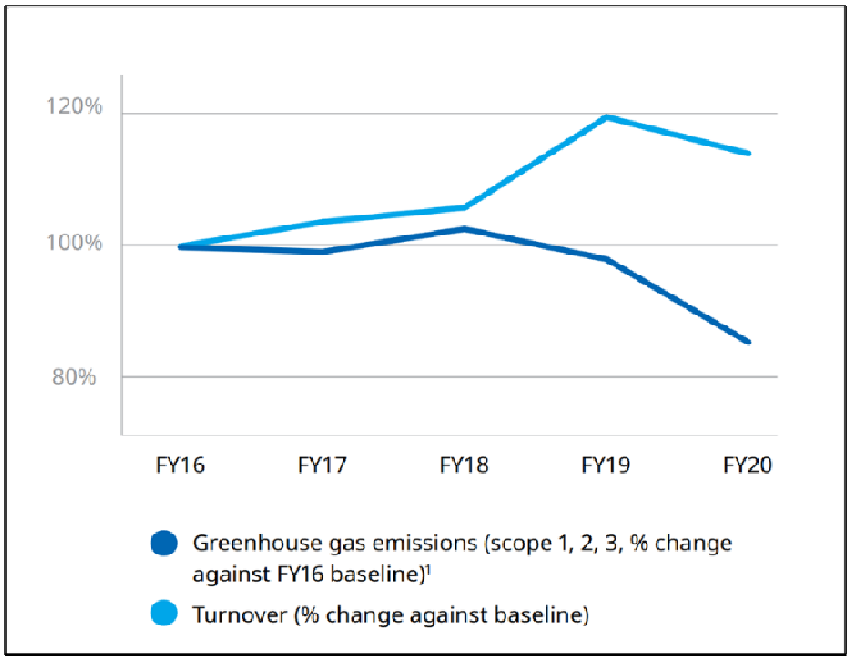

FIGURE 2: Climate footprint vs. business growth (tonnes of CO2 vs. turnover).

We focus on this first goal, the transformation into a circular business that affects all aspects of what is done at IKEA. In this sense the strategic goals for the year 2030 are (IKEA, 2020; p.24):

a) To design every product from the beginning to be reused, refurbished, remanufactured and finally recycled, applying its circular product design principles during product processing.In this respect more than 9,500 items - except for the Home ranges of the Home Smart range, lighting and household appliances - have been assessed, giving them a clearer picture of their current capabilities. The percentage of products complying with the circular product principles was 28.6%, with some ranges reaching 100%. The next step is to develop roadmaps for all product categories, describing the actions needed to make all products circular by 2030. In the product assessments, the following areas have been identified as the most influential:
   - Design for standardization and adaptability enables reuse and reconditioning through maintenance and repair possibilities, with standardized spare parts, and remanufacturing through reuse of parts in other products.
   - The choice of materials and their combination are the key factors for recycling and extending the range of materials. Using the right material for the expected lifetime based on the expected use minimizes unnecessary waste and misuse of materials. It also enables the recycling process to be simplified.
   - Home accessories have a higher rate of existing circularity than furniture. This is due, for example, to the simpler construction of components and material mixes.

b) The objective is also using renewable or recycled materials, by adapting and finding sources and by developing new materials.
   - 60% of IKEA's product range is based on renewable materials, such as wood and cotton, and 10% contains recycled materials. Mattress recycling, carried out in collaboration with recycling company Retour Matras in the Netherlands, has reached the final stage of testing recycled polyol, which has the potential to eliminate 3 mil-lion mattresses a year from incineration or landfill. The deployment of renewable polyols from soya is also continuing. Thus, this material has been used for six years in North America and is now

being introduced in Europe. Innovations to reduce foam in future comfort products are underway.
- New and updated products made from recycled material Some examples: TIP-PHEDE carpet is made from recycled/reclaimed cotton, SVA-LLET lamp is made from recycled plastic, ANNAKAJSA and BENGTA curtains are made from recycled polyester, and NYSKJÖLD drying mat has recently been designed to use 100% recycled fabric and trim.
- IKEA is always working to find innovative new ways to reduce resource use, including laminated veneer lumber (LVL), an engineered wood product. With up to 40% less wood consumption, this new material can even replace metal in terms of strength in some applications, mitigating a major climate impact. The process also generates less waste than many other processing methods, and therefore contributes to the good use of wood. The iconic KLIPPAN sofa is an example of how this new technology to create better and more sustainable products at lower cost.

c) Finding circular solutions for customers to acquire, take care and put forward the products to other people.
- Furniture as a service. In 2020, furniture rental models were piloted in six European markets, with the aim of exploring more circular ways for customers to use, care for and return their IKEA furniture. On return, the furniture was cleaned, refurbished and prepared for its next home. The challenge now is to find more efficient and scalable solutions.
- Furniture buy-back. By selling returned, damaged or ex-products at reduced prices through the "As-is" areas of most IKEA shops, the aim is to reduce waste. In 2020, 30.5 million products were sold in this way. Today, a growing number of IKEA markets also buy back IKEA furniture from customers who no longer need it and re-sell these good quality second-hand items to new customers in the As-Is areas. IKEA Sweden is testing an innovative pop-up shop stocked with second-hand IKEA products. The experience from this trial will be used to better understand the potential of this service.
- Increasing the availability of spare parts to extend the life of products. This year, more than 14 million spare parts have also been provided to enable customers to ex-tend the life of IKEA products. To make it easier for customers, an online ordering solution has been developed. Customers will be able to access it from the IKEA website worldwide in 2021.

d) Take initiative and join forces with others through advocacy, collaboration and business partnerships.Partnership with the Ellen MacArthur Foundation. In 2020, IKEA entered a partnership with the Ellen MacArthur Foundation. One of the objectives of the partnership is to establish a common set of definitions to facilitate communication and the development of circularity.But going circular can be reinforced with the idea of becoming climate positive. By 2030, IKEA is committed to becoming climate positive by reducing greenhouse gas emissions in absolute terms by more than the amount emitted by the IKEA value chain, while growing the IKEA business. This will contribute to limiting the global temperature increase to 1.5°C by the end of the century. This will be achieved in the following ways (IKEA, 2020; p. 28):

- Promoting sustainable choices and becoming a circular company.
- Striving for 100% renewable energy throughout the IKEA value chain.
- Using more sustainable materials and food ingredients.

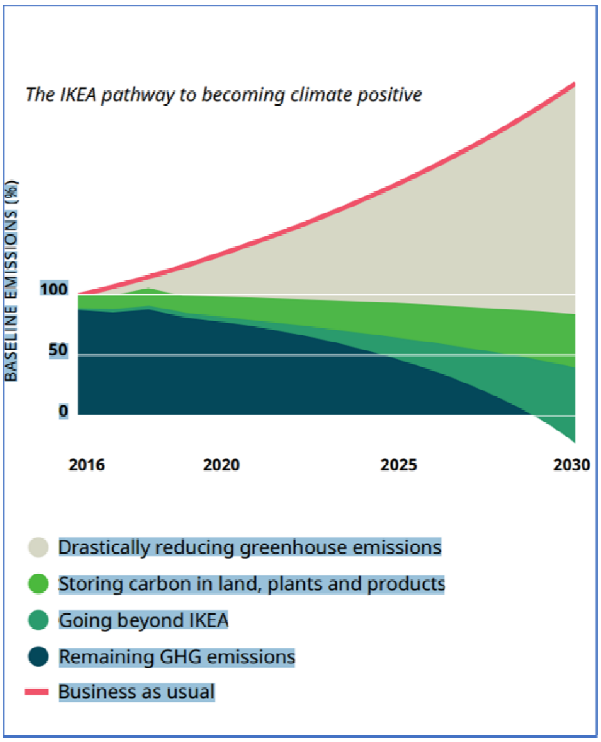

FIGURE 3: Figure the pathway to becoming climate positive by 2030.

In 2019 there was a break in the trend, with a decrease in the absolute climate footprint across the entire value chain, while IKEA's business continued to grow. In 2020, sales declined due to shop closures, resulting in a further decline in IKEA's absolute climate footprint in absolute numbers and making it unrepresentative. What is noteworthy is that there was also a 7% decrease in the climate footprint per unit of retail sales between 2019 and 2020 (see figure 3 for climate footprint per euro), due to several important improvements throughout the IKEA value chain. Between 19 and 20, the absolute climate footprint of the IKEA value chain decreased by 11%. During 2020, we saw solid progress in many areas that affect the total climate footprint, such as increased energy efficiency in the lighting and appliance ranges, a significant increase in plant-based food, an increase in renewable energy used in the production of IKEA products, and more than doubling of home deliveries with electric vehicles or other zero-emission solutions. In the transformation towards 100% renewable energy throughout the value chain, the share of renewable energy in the production of IKEA products increased slightly during the year to 46%, and in IKEA's retail and other operations (such as stores and offices), it decreased to 51%. This was mainly due to the expansion of the number of shops and customer fulfilment units in markets where renewable energy is difficult to access. Another challenge is to address the material footprint, for example by using more renewable and recycled. So these are now seen as key years for IKEA's major transformation. In this line, it has managed to create a more attractive and us-er-friendly website to facilitate shopping with an undoubtedly smaller carbon footprint. To this end, it has the advantage of using its large number of warehouses around the world as logistics centers.

	IKEA retail sales (EUR bn)	Climate footprint (index vs baseline)	Climate footprint per sales (Million tonnes CO_2 eq per EUR bn sales)
FY16	36.4	100	0.66
FY19	41.3	99.2	0.58
FY20	39.6	88.5	0.54

FIGURE 4: Climate footprint per euro.

4.2 Circular Economy in IKEA Practice

How to do this in practice? The IKEA group aims to (IKEA, 2020) Circular living is easy. Resource efficiency has always been part of the way of working at IKEA. Now the company wants to help make circular consumption the new normal for customers as well.

IKEA realizes that its customers do not like to waste, and neither does the company. In fact, they value the things they have and want to repair, reuse and recycle. However, there are problems in putting them into practice (lack of time, space, tools or just good intentions). By testing, adopting and scaling up new circular solutions, some of these barriers can be removed. IKEA therefore focuses on three key challenges:

- Restoring value: extending the useful life of materials and giving IKEA products a second life.
- New approaches to ownership - services that offer customers more flexible access to furniture without the need to own it, saving resources.
- -Things we no longer need - helping people deal with clutter by 2030, IKEA will move to a circular business model, adapting how and where it meets its customers. All IKEA products will be made from renewable or recycled materials and will be designed from the ground up to be reused, repaired, re-purposed, re-sold or recycled.

The first thing is to try to be climate positive. Being climate positive is about reducing more greenhouse gas emissions than the IKEA value chain emits, while growing IKEA's business. To do this they tell us what they are going to do:

1) Be powered by 100% renewable energy, while increasing energy efficiency. They ensure that the company will run on 100% renewable electricity by 2025 and completely phase out fossil fuel heating and cooling by 2030. They also aim to drive the decarbonization of the electricity sector, investing heavily in wind farms and promoting solar power generation to increase the amount of renewable electricity on the grid.
2) Aiming for zero emissions in home deliveries and halving emissions from customer and worker journeys in relative terms. Their ambitious plans to scale up electric vehicles and other low-carbon options mean that all home deliveries will have zero emissions by 2025. They have also launched several pilot schemes to encourage workers to travel more sustainably and are developing plans of their own to help customers travel more sustainably too.
3) Inspire customers to reduce their climate footprint. The company has set out to help customers generate and use renewable electricity, helping them reduce their emissions at home. It is also working to reduce the climate footprint of products throughout their life cycle by extending their life and offering customers returned and second-hand products.
4) Exploring circular resource flows. Among the actions taken, opportunities are be-ing sought to reduce the use of raw materials across the business. To this end, IKEA is

partnering with suppliers to reuse and recycle resources for non-home furnishing products, such as packaging and employee uniforms.

Ultimately, IKEA is striving to achieve a circular economy and has several fronts to do so:
First is striving for zero waste and using resources in a circular way (IKEA, 2019), It is always looking for ways to reduce waste, increase recycling, use fewer resources and apply circular principles throughout the business. Most of the waste produced comes from IKEA's retail operations, and about half of it is packaging material. The rest is product waste, food waste and other operational waste such as light bulbs. They prioritise actions to prevent, reduce, reuse and recycle waste - landfill is always a last resort. Some proposals have been:

a. Incineration for energy recovery.
b. IKEA is exploring new ways to reduce product waste, as every item that is not wasted is one less item to be produced and transported to stores. Thus, it is working with partners to develop circular re-source flows and to start measuring and reducing the use of raw materials in all operations.
c. In terms of waste recycling and reuse, IKEA produced 5% less waste in 2019 across all operations, continuing the trend started in previous years. This resulted in 71% recycling in 2019 compared to 67% in 2018. Investments to improve waste information systems have resulted in improved quality of waste data collected at the sites. Waste data has started to be tracked monthly and results have been shared with sustainability managers in each country, resulting in better management by increasing the quality of information.
d. The company has managed to give a second life to 47 million recovered products. Some IKEA products are removed from shop display, returned by customers or damaged in transit before arriving at the IKEA shop or on the way to customers' homes. Recovering products that are returned to our stock or sold is an achievement on the way to moving to more circular resource flows and saving raw materials. Thus, a total of 65 million products were returned or damaged in 2019, and three quarters (47 million) were saved from going to landfill. They were unable to recover 18 million products that were damaged, lost, expired or returned by customers. This means that their recovery rate improved by 2% compared to last year.

IKEA realises that there is always more that can be done to prevent product waste and is addressing this through the following actions:

1) Repairing and repackaging products to get them back on the shelf. IKEA has dedicated product recovery teams in shops that managed to get 9 million products in 2019 saved, 300,000 more than the previous year.
2) In many cases returned products are re-sold at a reduced price. Customers love products that are in good condition and have a large price reduction. As a result, 38 million products were resold in 2019. That is 3 million more than in 2018.
3) Another option is to provide customers and workers with spare parts so that products can be repaired more easily and thus extend the life of the product. Currently 70% of shops are now benefiting from an improved spare parts system.

In addition, food waste is being combated. Every year, many millions of people are served meals in IKEA shops. That is why food waste is being tackled, and the aim is to halve food waste from restaurants and cafés, bistros and Swedish food markets. In 2019, many shops continued to weigh every piece of food thrown away in kitchens to find ways to reduce waste. Overall, 68% of IKEA shops worldwide do this by seeking information to manage better. This has prevented 1.5 million kg of food from being wasted in 2019, which is equivalent to 6.5 million kg of greenhouse gas emissions.

Another action is the phasing out of single-use plastic. Progress is being made to-wards the goal of phasing out all single-use plastic items, such as straws and cutlery used for food. In 2019, IKEA restaurants and bistros in the UK and Canada stopped using single-use plastic. They are

using alternatives such as wooden cutlery and paper straws from sustainably managed forests. From January 2020, all single-use plastic items are required to be replaced with alternatives made from renewable materials.

In terms of water resource management, IKEA aims to use water efficiently. In 2019, water was recycled wherever possible. In the new centres, for example, rainwater harvesting tanks and water-saving fixtures and fittings are included in the design. For example, the new IKEA shop in Greenwich halved the shop's water use. Total water use decreased by 1.2% in 2019 globally across the group. In-store water use decreased by 1.9%, despite an increase in the number of stores during the year.

IKEA wants to be a responsible shopper. In addition to the furnishing products designated and supplied by the Inter IKEA Group, goods and services must also be purchased from thousands of other suppliers, including for construction, delivery, IT and food. Due to the large size of the means, it is possible to use the large scale to secure more sustainable sources. The IKEA supplier code of conduct sets out social, ethical and environmental conduct [43](IKEA, 2019), Thus, there is a desire to turn the supply chain around. In 2019, work has continued with suppliers for furniture materials such as packaging, IT equipment and construction to try to find more responsible and re-source-conserving solutions such as:

1) IKEA is aware that there is always more that can be done to close the loop in 24 IKEA shops in China so that thousands of tonnes of wastepaper packaging is re-turned to the paper mill that supplies it, which reuses it, thus saving raw material.
2) Reusing more than 10,000 IT products that were refurbished and refurbished or partially recovered, rather than wasted, working together with the supplier of new technologies.
3) Exploring a circular economy approach to employee uniforms
4) Buying more renewable materials as we replace the single-use plastic items in IKEA restaurants and cafés as well as Bistros. By 2030 it is expected that all materials will be reusable.

4.3 The circular economy is not improvised. It must be planned and designed in advance

But the most striking idea for a good integration of the circular economy, from our point of view, is the idea of accompanying the consumer in the use and enjoyment phase of their products, in such a way that the life of the product is extended by consuming less raw materials and therefore less waste. The programme is called "Let's save the furniture". IKEA offers six ideas to significantly reduce the 4% of the world's total waste that is furniture today:

1) You can sell the furniture you no longer need to IKEA. IKEA will act as an intermediary for those who may need it.
2) Take care of your furniture to extend its life. This is a battery of tips and products to extend the life of the products you buy from IKEA.
3) Repair your furniture. Possibility to get spare parts that may have deteriorated.
4) Customize your furniture. With imagination, design and good taste, your old furniture can be put to new uses.
5) Donate your furniture. Do not throw furniture away, IKEA can help you find social organizations that can repurpose furniture you no longer need.
6) Recycle your furniture. I am sure there are people in a situation of exclusion who may need something that you no longer have a use for.

All this could not be done after the fact, IKEA has the advantage of doing it through appropriate design to achieve the desired circular economy. This is a priori much more appropriate preparation, in our opinion. Thus, the proposed model is summarized in Figure 5.

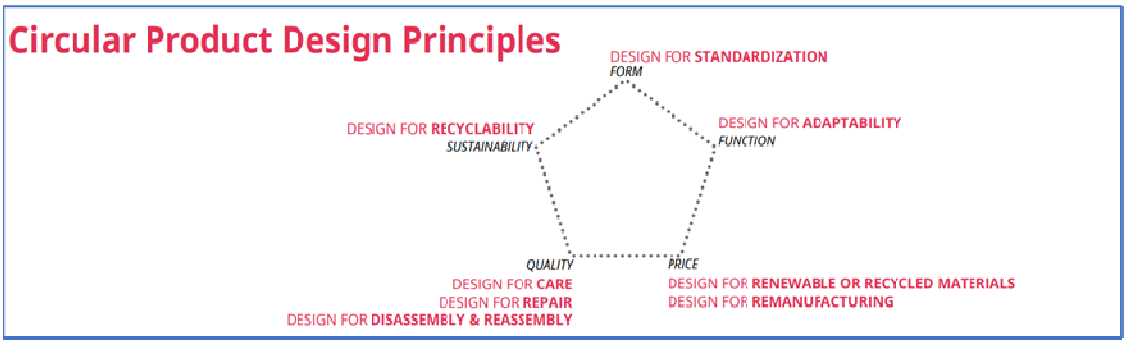

FIGURE 5: The Circular Design Principles.

The steps taken considering the general principles of the circular economy are twofold:

1) Designing with Renewable or Recycled Materials. Choosing the right materials from the outset.
2) Designing for standardization. Allowing for care, repair, upgrading, refurbishment, remanufacturing and ultimately recycling of products over an extended period.
3) In addition, IKEA uses five specific circular product design principles according to Circular Product Design Guide IKEA [44] (2019):
4) Designing for care. Extending the useful life of products through maintenance and prevention.
5) Designing for repairing. Products that are easy to repair when something goes wrong.
6) Designing for adaptability. Products that can meet the changing needs of customers.
7) Designing for re-manufacturability. Utilization of existing materials and parts in the production of new products.
8) Designing for recyclability. The choice of materials and how they are combined to enable recycling.

5. CONCLUSIONS

The first conclusion we draw from our work is that IKEA is a family business. It is true that the ownership does not reside directly in the family, but in a group of foundations in different countries, and we will not refer to those that have control of the ownership. However, when you look at the company, the values of the founder permeate the whole organization, the simplicity, the legacy of a furniture salesman is in every corner of the company that you look at.

This makes it possible to focus on a second conclusion and state that IKEA has the values of a family business, the so-called SEW values. This means that they prefer non-economic goals in many cases as opposed to the generally accepted eco-nomic goal. In this way, aspects such as reputation, loyalty, belonging, status and security or even altruism have a place in family businesses (Nicholson, 2008). In our case, the preservation of the environment and therefore the implementation of a circular economy business that implies a reduction of environmental impact is at the heart of the company.

This reduction in environmental impact is reflected in a reduction in the tonnes of CO2 discharged into the atmosphere, especially since 2018 (see figure 2), even though sales have continued to rise, which would imply a clear increase in the carbon footprint (measured in CO2 discharged into the atmosphere) with the traditional linear economy model.

We have also seen how Clean Energy Services in 11 countries have grown by 90%, which implies energy savings of more than 10 million euros and 63,000 tonnes of CO2. IKEA also promotes the use of sustainable materials that have a positive impact on reducing greenhouse gas emissions. This makes IKEA believe that limiting the global temperature increase to only 1.5 degrees by the end of the century is possible.

From an ethical point of view, we appreciate that IKEA has the following strategic objectives:

A) Designing each product to be reused, refurbished, remanufactured and ultimately recycled, applying its circular product design principles during product processing.
B) Using only renewable or recycled materials, adapting and sourcing and developing new materials.
C) Finding circular solutions for existing and new customers to purchase, care for and pass on products to other potential users.

All in all, from 2019 onwards, there was a turnaround, with a decrease in the absolute climate footprint throughout the value chain, while IKEA's business continued to grow. In 2020, sales decreased due to shop closures, resulting in a further decrease in IKEA's absolute climate footprint. This is not representative. What is noteworthy is that there was also a 7% decrease in climate footprint per unit of retail sales between 2019 and 2020 (see figure 4 climate footprint per euro), due to several major improvements across the IKEA value chain Great achievement indeed for our company under study. But we have certainly been surprised by two things. The first is that the company tells us that IKEA customers don't like to waste, and neither does the company. In fact, they value the things they have and want to repair, reuse and recycle. However, there are problems in putting them into practice (lack of time, space, tools or just good intentions). By testing, adopting and scaling up new circular solutions, some of these barriers can be removed, says IKEA. The second thing is that, to make a good integration of the circular economy, from our point of view, is the idea of accompanying the consumer in the phase of use and enjoyment of their products, in such a way that the life of the product is extended by consuming less raw materials and therefore less waste. The programme is called "Save the Furniture".

In terms of practical implications, the fact that the IKEA company is a family business and owns SEW means that through long-term strategic planning, the objective is to preserve the planet by changing the production paradigm, making use of the circular economy. The aim is to leave the world to the next generation at least as it was found and, if possible, a little better. Of course, it all starts with a clear goal of reducing the carbon footprint (a measure of the degree of implementation of the circular economy), but also with a clear understanding that design is essential to put it into practice. Thus, IKEA wants to design for the care, repair, adaptability, remanufacturability and recyclability of all its products. A great job done by the company and a great example for all companies, big and small, to follow. Grain by grain, all together, citizens and companies, we can make a more sustainable world.

Another remarkable practical implication is that in the end, what IKEA achieves is an emotional connection through design. In addition to a high product functionality recognised by customers and fans of the brand, an emotional connection is sought whereby people keep, repair and do not throw away a product. Objects that hold memories and tell stories are special because they represent and remind us of the most important parts of our lives. Those memories are more important than the product itself. IKEA can establish an emotional connection between a product and a customer, allowing for a convenient experience that appeals to their motivations: perceived value, affordability, and addressing feelings related to waste and citizenship. Each customer creates their own story about how they purchase, care for and pass on the product. By providing a positive experience at all stages of this journey, they can create an emotional connection not only to the IKEA product, but also to the IKEA brand. This makes our case study company a paradigmatic company that others will try to imitate and helps us to be convinced that we have not made a mistake in choosing it as a case study. Its leadership will make many other companies, both large and small, want to engage in circular economy to achieve a valuable resource, reputation and customer loyalty, intangible assets but undoubtedly of great value to the entrepreneur, especially if the company is family-owned and pursues more intangible assets than just a large marketable profit.

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