SENSEMAKING DURING A STRATEGIC CHANGE PROCESS TOWARDS CIRCULARITY

A Case Study of a Danish Print House

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Abstract

This case study, based on qualitative data collection, explores the transition from a linear to a circular business strategy. Scholars have expressed how these transitions commonly are troublesome for companies, since they imply major changes to their current business. The study at hand investigates the phenomenon of sensemaking during a strategic change process towards circularity in KLS PurePrint, a small-sized print company in Denmark. The case study outlines the key characteristics of circular economy and the technological transitions needed for this type of business strategies to be implemented. It further shows how managers can make sense of these transformation processes by creating an ongoing strategic change towards circularity by cumulatively adapting their strategy. The case study emphasizes the importance of creating interacts between the implemented strategy and the employees, as this results in the creation of commitment and thereby allows a common narrative to be established. This narrative can further be used for strategic adaptions to guide the change process towards circularity. In general, this case study suggests managers to embrace the ongoing phenomenon of sustainability in order to adapt their strategies to it. Further, it suggests that managers shall prioritize the interconnection with the actors along their value chain in order to complete the circular approach. Thereby, this case study recommends the management of KLS PurePrint to continuously update their strategy and to emphasize downstream communication in order to manage the complexity around the cradle-to-cradle process.

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Abbreviations

Carbon Dioxide	CO2
Forest Stewardship Council	FSC
Chief Commercial Officer	CCO
Chief Financial Officer	CFO
Chief Executive Officer	CEO
KLS PurePrint A/S	KLS PurePrint
Sustainable Development Goal	SDG
United Nations	UN

1. Introduction

In a digitalized world, companies have to adapt their strategies in order to stay competitive and profitable (Hirt & Willmott, 2014). The print industry experienced a great shift during the last decade, as digital solutions and technology have changed the market demand and thereby the use of products printed physically (Jackson, 2018). This shift has forced many print companies to adapt their business strategies in order to find a way to stay competitive.

One way to address this shift, and for print companies to differentiate themselves, has been to strategically focus on sustainability within the print industry (Jackson, 2018). This further creates the opportunity for companies to mitigate climate change, as their impact on the matter cannot be neglected (Rasche, Morsing & Moon, 2017). Glaciers are melting, ecosystems are collapsing, and the global temperature is rising, as a result of the overuse of the earth (NASA, n.d.).These effects have been foreseen by scientists, who predict that the global temperature will rise further, as a result of human activity and their CO2-emissions (NASA, n.d.). The new conditions that climate change creates will not only influence life on earth but also create challenges for companies, for example regarding access to raw materials and the maintenance of production capacity (Schiano, 2018).

The threats of the changing print industry, set within the greater challenge of climate change, generated the opportunity for print companies to engage themselves with creating sustainable products (Brunner, n.d.). This allows print companies to reduce their problematic use of toxic chemicals and raw materials, and thereby decrease their carbon dioxide-emissions (CO2-emission), as well as their harmful effects on the environment (Jackson, 2018).

A Danish company that was affected by the previously mentioned shift within its industry is KLS PurePrint A/S (hereafter referred to as KLS PurePrint); a small-sized print house with 45 employees (Appendix 1). In 2007, KLS PurePrint was one of many Danish print companies that were under great financial pressure, as a result of the market shift in the print industry. Thereby, the management decided to differentiate KLS PurePrint by creating a strategy based on sustainability. This new strategic journey for KLS PurePrint entailed their first step towards becoming circular and their current vision of being the greenest print house in the world (Appendix 1). Their journey towards circularity further required the management of KLS PurePrint to create an understanding towards the employees, in order for them to comprehend and to follow the new strategic direction.

1.1 Research Area

The area of research is exploring the intersection of strategic change towards circularity and sensemaking. This area is based on the internal changes needed for both managers and employees in order to adapt to a new strategic direction of a circular business process. Companies commonly struggle to transform their linear business process into a circular one, as it demands a company to find new means for creating value (Frishammar & Parida, 2018; Ritzén & Sandström, 2017). These means are at times still inadequately known, which implies need for further exploration. Thereby, this representative case study approaches this type of struggle in a small-sized print company in Denmark. The uniqueness of this specific case study is how KLS PurePrint has managed to transform from a typical linear process to a circular process but still being able sell print products.

1.1.1 Research Question

Based on the previously outlined research area, the following research question is stated:

How was the strategic change process towards circularity of KLS PurePrint constructed by the management from 2007 and onwards in order to be implemented throughout the company?

The following sub-questions are defined to be able to explore the research question further:

1. *How has KLS PurePrint management's view on sustainability changed from 2007 until today?*

2. *How did the management's view on sustainability affect the creation of strategies in KLS PurePrint and which dynamic capabilities were utilized?*

3. *How was sensemaking achieved in order to implement the strategies in KLS PurePrint?*

Delimitations

This case study focuses to explore the change processes that the new strategic direction included when KLS PurePrint approached sustainability in 2007. This entails that the case study does not aim

to fully account for the technical and biological processes that a cradle-to-cradle process includes. This is due to that these processes at times become much detailed, which is not fulfilling the research area of this study.

Moreover, this case study aims to explore the context of KLS PurePrint as a small-sized print house in Denmark. Therefore, this case study does not investigate the print industry as a whole in Denmark but rather the specific context of KLS PurePrint with some international influences based on their strategic collaboration partners.

1.2 Structure of the Case Study

Firstly, an introduction of the case setting and research area was outlined followed by the research question, its sub-questions and delimitations. Secondly, a description of the case will follow with an appurtenant timeline. Thirdly, a literature positioning will be presented to explain the main foundations of circular economy and the school of cradle-to-cradle. Fourthly, a meta framework is presented to establish an understanding for how approaching circular business strategies creates the need for internal transformations in companies. Fifthly, the theoretical framework is outlined to present the theories and theoretical concepts that the research question will be explored through. Sixthly, the methodology behind this case study will be explained as well as the philosophical foundations. Seventhly, the analysis will explore the strategic change process towards circularity taking place in KLS PurePrint from 2007 and onwards. This will be performed by answering the three outlined sub-questions regarding world view, strategy, dynamic capabilities and sensemaking in accordance to the three later described phases: Phase 1 (7.1), Phase 2 (7.2) and Phase 3 (7.3). Eighthly, the discussion will derive the findings from the analysis and discuss what implications they have both on theoretical and managerial level. Furthermore, strategic recommendations for KLS PurePrint will be provided. Ninthly and lastly, the conclusion will provide final remarks.

2. Case Description

In the following, the case of KLS PurePrint will be introduced in order to create a knowledge foundation for the coming analysis and discussion. The case description will be outlined in three phases: Phase 1 - Before 2007, Phase 2 - from 2007 until 2013 and Phase 3 - 2013 and onwards. A time line will be presented afterwards, which provides a detailed overview of the events throughout the years (Table 1).

2.1 Phase 1 - Before 2007

The print house KLS PurePrint, former known as K. Larsen og Søn A/S, was founded by Preben Larsen and his father Knud Larsen after the Second World War in 1947 in Lyngby (Appendix 5). During the first decades, the corporation invested in machines, such as in the Eikoff in 1951, a Heidelberg Print in 1963 and further in 1995 in the first indigo print machine in the Nordics (KLS PurePrint 1, n.d.).

In 1982 Preben's three children acquired all company shares, which were divided equally among them, which led KLS PurePrint into the third-generation of family ownership (Appendix 5). The company went through multiple relocations of their facilities, such as in 1968 to Søborg, in 1984 to Glostrup and in 1998 to their current premises in Hvidovre (KLS PurePrint 1, n.d.). In the 1990's, the management of KLS PurePrint introduced certifications of quality and sustainability standards. They started with the international ISO 9001 quality certification in 1995, further with the Nordic Swan Eco label in 1996 and later the environmental certification ISO14001 in 1998 (KLS PurePrint 1, n.d.).

In 2001 a fourth-generation family member joined KLS PurePrint after his studies at Copenhagen Business School with a major in Accounting (Appendix 1). He started out as CFO and became part owner of KLS PurePrint and the CCO later in 2006. His task as a CCO was to focus on sales and external representation, while the CEO focused on production (Appendix 5). Until that point in time, the corporation had never worked with a shared vision, neither been aligned on a strategic direction (Appendix 5). Previous strategic decisions were mainly based on investments in new facilities, or technological investments such as new machines or systems (Appendix 1). In 2006, the Board of Directors was extended by an external Chairman (Appendix 1; 5; 6). One additional external Board Member (hereafter referred to as Board Member 1) was elected in the following year. The inclusion

of these two new members serves as the first members in the Board of Directors who were not a part of the Larsen family and brought external knowledge.

2.2 Phase 2 - 2007 and Onwards

In 2007, KLS PurePrint was under great financial distress due to digitalization and the resulted new customer demands (Appendix 1; 6). Due to this situation, the management of KLS PurePrint decided to create their first professional strategy (Appendix 1; 6). This was initiated as the Board of Directors and the management of KLS PurePrint participated in a two-day strategy weekend together with key employees, with the goal to create their first formulated strategy and vision. As a result, the vision of becoming "the greenest print house in Scandinavia" (Appendix 1, p. 3) was born. The decision of approaching sustainability was based on how the management found it as a print market niche that was not approached by their competitors in Denmark (Appendix 1). Further, the goals of becoming carbon neutral before 2010 and reducing electricity usage per produced item by 20% was set (Appendix 1). Moreover, a process of supplier impact mapping allowed KLS PurePrint to assess their CO2-footprint (Appendix 1; 5). The vast mapping of their different paper suppliers created the possibility for KLS PurePrint to find ways to decrease their CO2-emission through supplier cooperation and changes in product sourcing. As this strategy was focused on CO2-reduction, it will from now on be referred to as the CO2-strategy. The strategy was further emphasized by sourcing carbon neutral electricity via an investment in Hvidovre Wind Turbine Cooperative (Appendix 1). Moreover, KLS PurePrint purchased an electric car and an electric truck, which enabled further reduction of the KLS PurePrint's CO2-emissions (KLS PurePrint 1, n.d.).

In 2008, KLS PurePrint won the Climate Cup Strategy Price as a reward for their new strategy (Appendix 1; 3). In the same year, KLS PurePrint additionally implemented the Forrest Stewardship Council certificate (FSC) as a demand towards their suppliers (Appendix 1). Moreover, in 2009, two years after the implementation the CO2-strategy, KLS PurePrint became the first print house in Scandinavia to became CO2-neutral (KLS PurePrint 1, n.d.).

The management of KLS PurePrint and the Board of Directors met up once a year to decide upon further strategic actions and in 2010 the first revision of the CO2-strategy was made (Appendix 1). At this meeting, the management of KLS PurePrint set further goals of annual CO2-emsisson reduction by 10% (Appendix 1). To reach this goal, an investment in a new climate friendly white

roof was made (Appendix 1; 6). This allowed for an energy reduction of the cooling system that was utilized in the production facility. In 2012, the KLS PurePrint further received the annual Environmental Award from the Municipality of Hvidovre (KLS PurePrint 1, n.d.).

2.3 Phase 3 - 2013 and Onwards

In 2013, Board Member 1 was exchanged with a new external Board Member (hereafter referred to as Board Member 2) (Appendix 1; 6). Her inclusion brought additional knowledge about circular processes to KLS PurePrint due to her background in biology and business (Center for Cirkulær Øknonomi, n.d.). The Board of Directors felt a need for a greater vision at this time and therefore Board Member 2 suggested the development of biodegradable products, which was agreed upon (Appendix 1). The development of biodegradable products led to an update of the previous vision towards becoming the "greenest print house in the world" was (Appendix 1, p. 6). This was the start signal of when KLS PurePrint started to work towards becoming cradle-to-cradle certified.

In 2014, the cradle-to-cradle introduction was facilitated by repeating the research on the paper and ink qualities of their different suppliers (Appendix 1; 5). This process of supplier impact mapping resulted in high requirements, which could only be met, by developing new materials (Appendix 1; 5). Additionally, the management of KLS PurePrint found the print house Gugler in Austria that had become the first cradle-to-cradle certified print house in the world. KLS PurePrint contacted them and went on a visit with a team, consisting of the CEO, the CCO, the Chairman and Board Member 2 (Appendix 1; 5). This visit created a collaboration between the two companies since they focused on the same values and had both started and further finalized a change process towards becoming cradle-to-cradle certified (Appendix 1). Therefore, the collaboration was originated and the PurePrint production label was developed in 2015 (Appendix 1). This development process was enabled through KLS becoming a part of the Grøn Omstillingsfund, that generated necessary financial resources for the development phase and consisted mainly of the supplier impact mapping (Appendix 1). As a result, KLS PurePrint and Gugler had to find new suppliers and co-develop new materials, such as paper and ink, that fit the specific print machine requirements (Appendix 5). In 2016, another print house called Vögeli joined the PurePrint label (Appendix 7).

Through the collaboration and co-creation of the PurePrint process, the company was able to fulfil the five quality criteria of the Cradle-to-Cradle certificate in the year of 2015 (Appendix 1). The five

quality criteria are 'Material Health', 'Material Reutilization', 'Renewable Energy Carbon Management', 'Water Stewardship' and 'Social Fairness' (Cradle to Cradle 1, n.d.). Thereby, KLS PurePrint became the second print house in the world with the cradle-to-cradle certification (Appendix 1). In the year 2016, KLS PurePrint received their first cradle-to-cradle Roadmap to guide improvement across the different quality criteria of different products. Moreover, due to the collaboration with Gugler and the resulting label, KLS PurePrint underwent a change of company name into the mentioned "KLS PurePrint A/S".

During the Paris Agreement in 2015, the "*2030 Agenda for Sustainable Development"* was created by the United Nations (UN) (United Nations, n.d.). The agenda contains of 17 Sustainable Development Goals (SDGs) that have the objective to "end poverty, protect the planet and ensure prosperity for all as part of a sustainable development agenda" (Gerard, Howard-Greenville, Joshi & Thianyi, 2016, p. 1881). The 17 goals are presented in Figure 1 below. Each goal is defined by the UN and together they have 169 sub-targets, with the following 232 indicators to measures the progress made by corporations (United Nations Statistic Division, n.d.).

Figure 1: The Sustainable Development Goals (United Nations, n.d.)

Two years after the UN developed the SDGs, KLS PurePrint decided to ingrate them into their corporation (Appendix 1). This was decided upon during a management meeting together with the Board of Directors. The CCO expressed how this decision was based on external pressure: "When we first implemented them it was really much communication wise in sales, because we could see

how everybody talked about them […] Okay, pretty much we also have to" (Appendix 1, p. 16). This decision resulted in that KLS PurePrint implemented seven goals internally (3, 6, 7, 12, 13, 15, 17) and three goals externally towards customers and suppliers (3, 12, 15) (Appendix 7). The external SDGs were implemented based on that the management felt how "they reach more out into other companies" (Appendix 1, p. 8) and how they create the possibility for them to "tap into each other's value streams" (Appendix 7, p. 3).

The management of KLS PurePrint had taken different actions in order to incorporate the SDGs into their corporation. Firstly, the management facilitated a workshop with the employees in 2017. During this workshop the SDGs were presented to the employees and they were further asked to pick the one that they found as the most important (Appendix 1). Secondly, KLS PurePrint developed several products as for example posters, flyers and cubes portraying the different SDGs. Thirdly, the CCO joined the UN Global Compact Network in 2018 (Appendix 1). This network is developed to advance managers' knowledge and skills regarding sustainability via interactive sessions (United Nations Global Compact, n.d.). Fourthly, the CCO is on the Advisory Board of the SDG Accelerator Program in the UN (Appendix 7).

At last, KLS PurePrint is currently in the process to obtain a food certification (Appendix 1; 3). This is in order to develop food packaging and thereby start to engage in the problem of plastic waste that ends up in landfills. KLS PurePrint had already engaged with the food package industry as they developed Treatbox in 2017 (KLS PurePrint 3, n.d.). Treatbox was developed as a solution to minimize food waste and is a doggy bag that is given out at restaurants and other eateries for people to bring their leftovers home (Treatbox, n.d.).

The timeline (Table 1) below highlights the previously mentioned key events of the case company KLS PurePrint from its foundation until today. The table is clustered by the three identified phases and follows the chronological order of the events.

	Year	Event
PHASE 1	1946	Foundation of the company "K. Larsen og Søn"
	1951	Investment: Print machine Eikoff
	1956	Moved facility to Lyngby
	1963	Investment: Print machine Heidelberg
	1968	Moved facility to Søborg
	1982	Children took over KLS PurePrint
	1984	Moved facility to Glostrup
	1995	Investment: Print machine indigo
	1996	ISO 9001 Quality Certification
	1997	Nordic Swan Eco label Certification
	1998	Moved facility in Lyngby Hvidovre
	1998	Investment: Print machine 8 colour & 5 colour
	1999	ISO 14001 Environmental Certification
	2001	CFO Joins KLS PurePrint
	2006	CFO becomes CCO and shareholder
PHASE 2	2007	Strategy weekend 1: CO2-strategy
		Vision: “The Greenest Print House in Scandinavia”
		First Process of Supplier Impact Mapping
	2008	Climate Cup Strategy Award
		FSC certification
	2010	Carbon neutral
		Invest in Hvidovre Wind Turbine Cooperative
	2012	Investment: White roof
		Hvidovre Environmental Award
	2013	Board Member 2 joins
		Strategy weekend 2: cradle-to-cradle strategy
		Vision: “The Greenest Print House in the World”
		Investment: Electric Car and Truck
		Second Process of Supplier Impact Mapping
	2014	Joins Grøn Omstillingsfond
	2015	Start collaboration with Gugler
		Launch of PurePrint label
		Cradle to Cradle certification
PHASE 3	2016	Development of the first cradle-to-cradle Roadmap
		Enterprise of the Year in Hvidovre
		Change of Corporate Name to KLS PurePrint
		Vögeli joins PurePrint label
	2017	Integration of the SDG’s
		Creation of the Treatbox for food waste
		C2C Development of the second cradle-to-cradle Roadmap
	2018	Joined Global Compact

Table 1: Timeline of Events

3. Literature Positioning

A literature positioning of the topic of circular economy will be presented to create a foundation for the following meta framework. Therefore, three areas will be reviewed within circular economy. Firstly, reasons why circular economy shall be viewed as the original view of economics (Pearce & Turner, 1990). Secondly, a description of circular economy and the seven schools of thought will be outlined (Ellen MacArthur Foundation, n.d.; Regenerative Studies, n.d.; Webster, 2017). Thirdly, a in depth description of the cradle-to-cradle school will be performed (Braungart, McDonough & Bollinger, 2007).

3.1 Circular Economy

Pearce and Turner (1990) seek to widen the understanding of economy and are concerned with the interaction between the environment and economy, namely *environmental economics*. Environmental economic is often framed by the society as a more holistic view of the economy than the traditional view since it includes the natural environment (Webster, 2017). Pearce and Turner (1990) argue that this causes the society to see it as superior and alternative to the *traditional view of economics*, which is widely taught in today's society. However, Pearce and Turner (1990) see this as misleading, as they define the environmental economics as the original view.

The Interaction between the Environment and the Economy

Pearce and Turner (1990) outline the traditional economy as set of relations between *inputs* and *outputs* (Figure 2). Within inputs, they define how *primary inputs*, such as labour and capital, are used in *industries* to *produce commodities* (Pearce & Turner, 1990). Within outputs, *commodities* and *industries* are also included, which is followed by the *final demand* from the consumers (Pearce & Turner, 1990).

Figure 2: Input-Output without Environment (Based on Pearce and Turner, 1990)

However, Pearce and Turner's (1990) focal point is the environment and therefore include it in the traditional economics view in order to see how economic change affects the environment (Figure 3). They add the category of *environmental commodities* to inputs, which is referring to natural resources, in order to demonstrate how the natural environment generates input to the economy.

Figure 3: Input-Output with the Environment (Based on Pearce and Turner, 1990)

Further, the category of *waste discharge to environment* is added to output to demonstrate how resources become waste as an output of the economy. These two categories are not monetary measured but rather mentioned in physical terms (Pearce & Turner, 1990). This implies that it is still not fully possible to outline how the economy and the natural environment interact but at least it outlines a formalized and a more general relationship.

The Flow of Resources

Pearce and Turner (1990) argue that the traditional economics view is linear as the natural environment is ignored. This is as it is seen as moving from *production* to *consumer goods* to *utility*. By adding *natural resources* to the flow, the flow moves from resources, to production to consumer. This highlights how resources create input to a productive system. However, Pearce and Turner (1990) underline that this is still incomplete as this flow ignores *waste* and thereby, indirectly hint that the natural environment is a good place for waste. Further, they state that this is incorrect as it is the economic system that generates the waste, and highlight that the natural environment already has a functioning waste system that recycles its own waste, by for example moulding (Pearce & Turner, 1990). From this observation, Pearce and Turner (1990) argue that it is of great importance to focus on waste that is created by the economy and emphasize that waste is created at all steps of the flow, as in resources, production and consumption.

By applying the *First Law of Thermodynamics*, Pearce and Turner (1990) highlight how the amount of utilized natural resources is equivalent to the amount of waste at any time, since the First Law of Thermodynamics states that energy and substance cannot be either created or destroyed. However, it

can be utilized and thereby end up in the environmental system. In other words, energy or substances can only be converted and consumed but not demolished (Pearce & Turner, 1990). Furthermore, Pearce and Turner (1990) describe the earth as a closed economic system, where the economy and the natural environment are in a circular relationship. In this circular relationship, "everything is an input into everything else" (Pearce and Turner, 1990, p. 37). Thereby, the linear system of traditional economics is transformed into a circular one by including the next step of the flow, namely *recycle*. Recycling can deal with some of the waste that is created from the different steps in flow in order be turned into a resource again.

However, Pearce and Turner (1990) underline that a lot of waste ends up in the natural environment due to the *Second Law of Thermodynamics*. The law states that some materials are consumed entropically, meaning that they get used in the economic system and are thereby not possible to recycle technically or economic feasible. This type of waste ends up in the environment as for example CO2. If the amount of waste is bigger than what the environment can handle, then the recycling function of the environment will be damaged (Pearce and Turner, 1990).Thereby, Pearce and Turner (1990) have created a description of *the circular economy* as a closed and circular system that is based on the two Laws of Thermodynamics. Further, they emphasize how resources can directly create *positive amenities* and how waste can generate *negative amenities*, which both directly affects the utility (Pearce & Turner, 1990). These relationships are outlined below in Figure 4 in the *material balance model*, which is a simplified version of the original model created by Pearce and Turner (1990). In the model, the blue coloured parts represent the utility flows and the grey coloured parts represent material and energy flows.

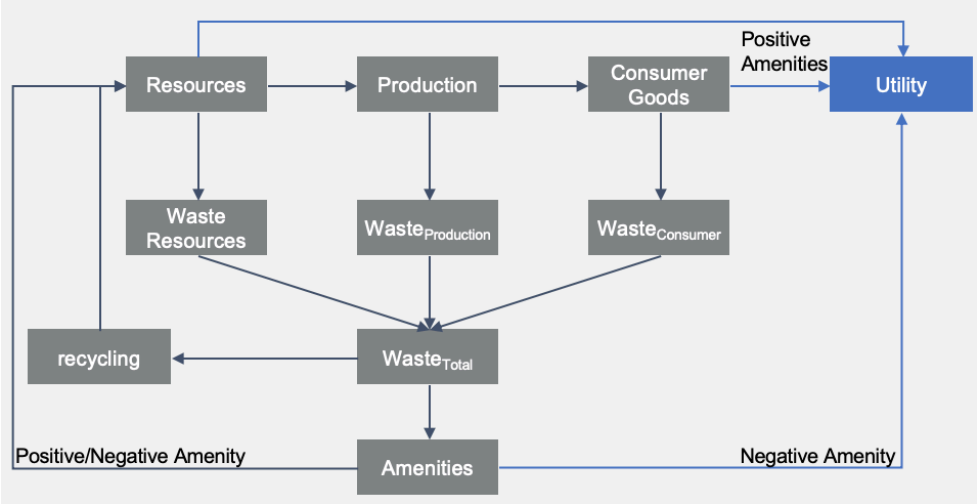

Figure 4: The Material Balance Model (Based on Pearce & Turner, 1990)

This circular model defines three economic functions of the natural environment (Pearce & Turner, 1990). It demonstrates the natural environment as a supplier of resources, as a waste assimilator and as a direct source of utility. Pearce and Turner (1990) argue that the inhabitants on earth mistreat the environment since they do not see the positive value these functions have for the economy. This leads to the general problem of that the design of traditional economics is not supporting the circularity, and thereby does not guarantee that the function of the environment can carry on. Therefore, Pearce and Turner (1990) argue that if the will is to enable the economy and the natural environment to have a peaceful relationship, then it is necessary to acknowledge and embrace the circular economy that has always been present by the two Laws of Thermodynamics. As this is important for earth in the long-term, Pearce and Turner (1990) argue that circular economy shall be seen as the *primary economic approach*.

3.2 The Seven Schools of Thoughts

As previously mentioned, Pearce and Turner (1990) that circular economy shall be seen as the primary economic approach, since earth's natural systems usually are circular. Moreover, circular economy is gaining more and more attention around the world and has created a different approach to generate prosperity in society by designing restorative circular systems of resources (Ellen MacArthur Foundation, McKinsey Center for Business and Environment, & SUN, 2015; Webster, 2017). The objective of circular economy is to maintain the value of products and their materials at the highest during all times (Webster, 2017). Further, a circular system differentiates between biological and technical cycles and aims to maintain them at the highest possible utility. These systems are visualized by the value circle below in Figure 5 (Ellen MacArthur Foundation et al., 2015).

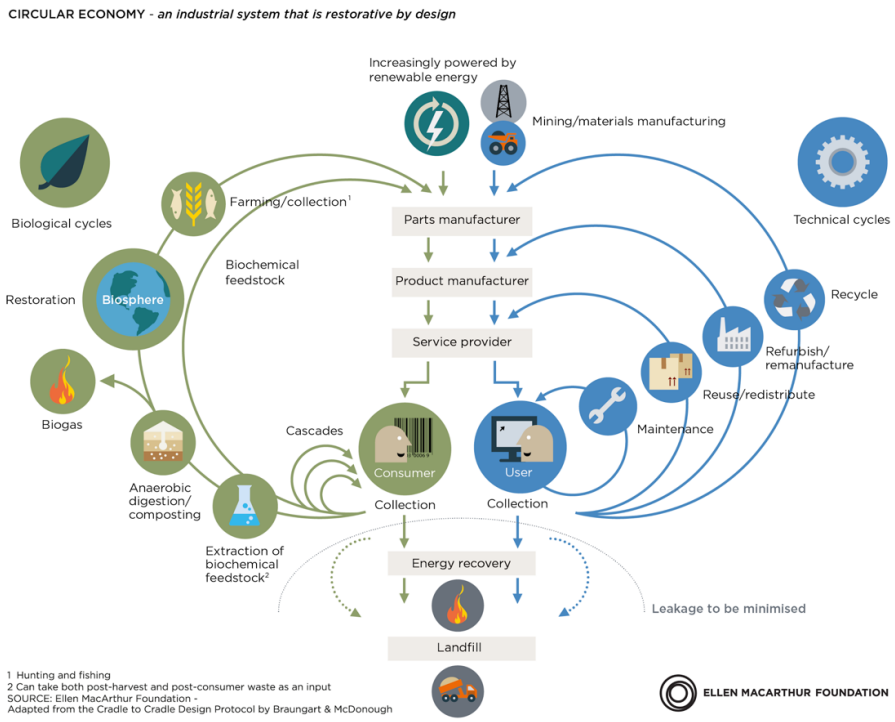

Figure 5: The Value Circle (Ellen MacArthur Foundation et al., 2015)

The left side of the value circle, the biological cycle, illustrates how biological materials can consumed and then put back into the circular system via for example composting (Ellen MacArthur Foundation, n.d.). The biological cycle provides renewable resources to the economy by regenerating the materials. On the right side of the value circle, the technical cycle restores and recovers materials via different options, as for example maintenance and reuse (Ellen MacArthur Foundation, n.d.). Further, in the technical cycle, the last option is to recycle.

Circular economy creates the opportunity for companies to develop innovative solutions in terms of product design and business models (Webster, 2017). This puts emphasis on the establishment of holistic systems that generate environmental benefits in the long-term. Therefore, moving from a linear towards a circular economy creates new settings for companies and demands them to redesign their business models and to create new strategies. The Ellen MacArthur Foundation (2015) highlights that this transition can only be achieved holistically across value chains via collaborations.

The concept of circular economy does not stem from a single author and has attained momentum since the end of the 1970s (Ellen MacArthur Foundation et al., 2015). From then on, the concept has

grown and been redefined by *seven schools of thought*: *performance economy, regenerative design, industrial ecology, biomimicry, blue economy, permaculture* and the focus of this case study, *cradle-to-cradle* (Ellen MacArthur Foundation et al., 2015). They will all be explained below. Cradle-to-cradle will be explained more deeply in the next section as it is the school of thought utilized by KLS PurePrint.

Performance Economy

The *performance economy* stems for Walter Stahel who developed the idea of a closed loop approach in production processes (Webster, 2017). The main objective of the closed loop approach is to extend product-life, create long-life goods, recondition activities and prevent waste. Further, the performance economy promotes the importance of focusing on creating services and performances rather than goods as it minimizes risk and waste and honour systemic solutions.

Biomimicry

Biomimicry was initiated by Janine Benyus, which is an approach that emphasizes the intelligence of the nature as it studies it and then try to imitate the design processes it has created (Webster, 2017). These design processes are thereafter applied to concrete problems of humankind. Biomimicry is based on three ground principles as it views the nature as a model for how processes and systems can solve problems, a measure for how sustainable the solutions are and a mentor in terms of what humankind can learn for it and not take from it (Webster, 2017).

Industrial Ecology

Industrial ecology investigates the connections between the actors in an industrial system, which is called and industrial ecosystem, and studies its energy flow and materials (Webster, 2017). The objective with this school of thought is to generate closed loop processes where the waste can be turned into input again after being utilized. This approach emphasizes to eliminate by-products as it is seen as undesirable and thereby demands a systemic approach in order to create an overview of the whole production process (Webster, 2017). This also implies that the production processes are designed and managed after local conditions in order to not harm the environment and the social wellbeing and to operate as closely to the present living system of the nature.

Blue Economy

Gunter Pauli founded this school of thought based on his book and case studies (Webster, 2017). The *blue economy* is an open-source movement that takes stance from the manifesto of "using the resources available in cascading systems, the waste of one product becomes the input to create a new cash flow" (Webster, 2017, p. 52). The blue economy relies on 21 principles and aims to create solutions that are driven by the traits of the local environment and highlight gravity as a fundamental supplier of energy.

Permaculture

Permaculture was initiated by the two ecologist David Holmgren and Bill Mollison and is described as an agricultural ecosystem that is designed and cultivated consciously and has the characteristics of being resilient, stable and diverse natural ecosystem (Webster, 2017). Permaculture has improved harvests as it at the same time has reduced the consumption of water and improved the quality of soil by implementing different elements of both innovate solutions (Webster, 2017).

Regenerative Design

The thought of *regenerative design* stems from John Lyle developed, who the idea of regenerative agriculture in order to apply it to all types of systems (Webster, 2017). Regenerative design is an approach that considers the system as a whole, meaning that it restores, renew and revitalizes the utilized sources of material and energy. The objective with regenerative design is to create resilient systems that take both the humans and the nature into consideration and demands a process-oriented approach when being created (Regenerative Studies, n.d.).

3.3 Cradle-to-Cradle

Braungart et al. (2007) present *eco-effectiveness* and *cradle-to-cradle design* as a strategy to create healthy emissions. Eco-effectiveness has a positive agenda for the production of goods and services and includes economic, social and environmental benefits, defined as the triple bottom line (Braungart et al., 2007). Thereby it goes beyond *eco-efficiency*, at is focuses on reducing unintended negative consequences of product or service processes (Braungart et al., 2007). Eco-effectiveness focuses on developing systems that can maintain and increase the quality and productivity of material

through following life cycles (Braungart et al., 2007). This means that eco-effective systems handle the bottlenecks of eco-efficiency by redesigning material flows and its insufficient way of dealing with toxic materials. Braungart et al. (2007) thereby stress the long-term benefits resulting from the eco-effective systems. Cradle-to-cradle is a design framework and an important component of the eco-effectiveness concept (Braungart et al., 2007). The framework creates industrial and product systems that emphasize a positive agenda for the environment and long-term growth. Further, the cradle-to-cradle design is a circular system that accumulates material intelligence overtime, which is defined as upcycling (Braungart et al., 2007). These processes create synergies between the economic and ecological systems and create a positive interrelation.

Eco-Efficiency

In order to fully explain eco-effectiveness, it is important to explain the concept of eco-efficiency first. The goal of eco-efficiency is to reduce unintended negative consequences of product processes (Braungart et al., 2007). This emphasizes a linear system that has a one-way direction, going from raw material to being disposed after being utilized. This approach seeks to minimize the effect of the product and its process by mainly five different strategies: *dematerialization*, *increase resource productivity, reduce toxicity, increase recyclability (downcycling)* and *extended product lifespan* (Braungart et al., 2007). These strategies relate further to the *transitional 5Rs* mentioned by Borland, Ambrosini, Lindgreen and Vanhamme (2016), which will be presented in the Theoretical Framework 5.1.3. Moreover, these types of strategies are developed to reduce the negative impact on the environment in the short-term. However, Braungart et al. (2007) argue that the five strategies will not achieve economic and environmental objectives in the long-term. This is as they do not redesign material flows and thereby do not address the real source of the negative impact on the environment. Further, Braungart et al. (2007) argue that they will not create innovation, which is due to that dematerialization hinder an innovative process, as it often associated with the idea of more waste creation. At last, Braungart et al. (2007) mention that these strategies do not address toxicity, which is a common issue in global supply chains. At last, eco-efficiency has received critique as it is deals with the negative consequences of a product processes and do not address the real source of the issues (Braungart et al., 2007). Hence, Braungart et al. (2007) critique this approach by saying that doing "less bad is no good" (p. 1338). Thereby, it is argued to be a reductionist approach.

Eco-Effectiveness

The general assumption behind eco-effectiveness is that the industry is "100% 'good" (Braungart et al., 2007, p. 1342), as it supports and recreates ecological systems that create possibility for long-term economic growth. This creates a possibility for the triple bottom line to be present as it seeks minimize the ecological footprint. Braungart et al. (2007) underline how the material flows within eco-effectiveness are circular and emphasize the internal process of a living organism. This is possible, as they assign the circular approach the characteristic of having a metabolism, which is inspired by nature, as the output of one process shall become the input for another one. Hence, the focus on reducing waste is eliminated, as the goal of eco-effectiveness is not to not create any waste from the beginning (Braungart et al., 2007). The focus is on maintaining or upgrading the quality and productivity of the used materials and to keep them in a closed system (Braungart et al., 2007). Thereby, the utilization of toxics is not seen as a problem as long as they are kept in these closed systems. Thus, eco-effectiveness is concerned with the quality of the emission and that it shall be positive and healthy for the surroundings (Braungart et al., 2007). Eco-efficiency and eco-effectiveness can be complementary under certain circumstances (Braungart et al., 2007). Eco-efficiency can be seen as positive if the main goal is eco-effectiveness. Then the eco-efficiency will narrow down the material flow per product. Thereby, the fulfilment of eco-effectiveness can be improved my minimizing the utilization of equity by optimizing the processes via eco-efficiency.

Cradle-to-Cradle Design

Cradle-to-cradle design generates the opportunity to create an advantageous system that is forced by the synergy effects of the triple bottom line (Braungart et al., 2007). Within cradle-to-cradle design, materials enable a circular flow similar to a metabolism. (Braungart et al. (2007) differentiate between two different types of materials, namely biological and technical, following the value circle (Figure 5). Biological materials are biodegradable, which means that the do not put any harm on living systems and can be used by humans and be put back in the biological process without a negative impact (Braungart et al., 2007; Ellen MacArthur Foundation et al., 2015; Webster, 2017). They often consist of natural and plant-based materials but can also occur in different forms of biopolymers or synthetic materials that are safe to utilize. Technical materials usually consist of synthetic or mineral materials that have the potential to be remained safely in the closed loop created by the cradle-to-cradle design (Braungart et al., 2007; Ellen MacArthur Foundation et al., 2015; Webster, 2017).

Moving from Efficiency to Effectiveness

In order for a company to move from eco-efficiency to eco-effectiveness they need to implement the new systems and strategies (Braungart et al., 2007). Braungart and McDonough (2001, mentioned in Braungart et al., 2007) outline a stepwise strategy to perform this. The five steps are the following (Braungart et al., 2007):

1. Free of…: The objective is for the company to eliminate undesirable substances, often referred to as X-substances, in their product or service processes during this initial step.

2. Personal preferences: During this step the company need to get educated about the substances that shall replace the X-substances. This is often difficult for the companies as detailed information are required about the impact of substances along their life-cycle. Often the management's personal preferences determine the decision based on available information Thereby, it does not often end with the most eco-effective but at least a less bad option than the initial substance.

3. The passive positive list: At this step, a systematic assessment of all ingredients in a product shall take place in order to classify them according to toxicological and eco-toxicological characteristics. This will assess their capability to flow in technical and biological metabolism. Hereafter, a passive positive list can be created. This list classifies each ingredient after their suitability for the biological metabolism.

4. The active positive list: Step four includes that all components of a product shall be defined as either biological or technical nutrient. This takes place by cutting done the passive positive list and fully optimize the process.

5. Reinvention: The final step includes a reinvention of the relationship between the customers and the product. This can take place by defining the product as a service that fulfils both customer's demands and social and ecological systems. *Products of service* implies that the product is owned by the company but utilized by the customer. This can be seen as beneficial for both the company and customers. On the one hand, the company can stay responsible of the technical materials and their objective to create durable products. On the other hand, the customers do not have to carry the responsibility for the hazardous materials.

Hereby, a description of the cradle-to-cradle school has been made. This will be used in the Analysis 7.3 to explore the phenomenon of sensemaking during the strategic transformation process towards circularity made by KLS PurePrint.

4. Meta Framework

The objective with the meta framework is to create a foundation for the later presented theoretical framework regarding corporate strategies for sustainability and sensemaking. Therefore, Geels (2002) will be presented to explain the complexity and the dynamics of socio-technical changes towards circular business processes.

4.1 A Technical Transition from Linear to Circular Economy

Geels (2002) examines how *technological transitions* occur and what patterns and mechanisms are parts of the process. A technological transformation is defined as a major and long-term change in which a societal function is fulfilled (Geels, 2002). He underlines how societal functions are accomplished by *socio-technical configurations* and how these functions take place due to the linkage between actors in a network. Thereby, technology needs human action and social structures in order to be meaningful, which is later emphasized by Hernes, Hendrup and Schäffner (2015). Moreover, Geels (2002) argues how, for example technology, infrastructure and networks need to be replaced in order to move from one socio-technical configuration to another, which underlines a *re-configurations process*. This process is regularly characterized by inertia as the elements are tightly coupled and aligned. As a result, it is at times difficult for radical innovation to break through, since it has to overcome established infrastructure, user practices and maybe even regulations.

A Multi-Level Perspective on Technical Transitions

Geels' (2002) perspective on technological transitions approaches multiple levels, as he includes three layers where a technical transition takes place: *niches, regimes* and *landscape*. He highlights how existing socio-technical configurations are created by the coordination between the different elements and actors that surround them. This creates stability as the actors and their activities are aligned and coordinated, which is highlighted by Hernes et al. (2015) as *micro stability*. To explain this type of coordination, Geels (2002) takes stance from Nelson and Winter (1982, mentioned in Geels, 2002), who see coordination as an outcome of organizational and behavioural routines, which emphasize that routines create a certain behaviour. Thereby, technological regimes lead to certain t*echnological trajectories* as the actors in a group move in the same direction and create stability. This guides

innovation towards incremental improvement of already existing technology. Geels (2002) also utilizes Rip and Kemp (1998, mentioned in Geels, 2002) to emphasize the different present elements and the linkages between them. They see a technical regime as a set of rules within a context, which leads to specific processes and characteristics. This view includes both *human* and *non-human actors* (Geels, 2002). This socio-technical approach will also be underlined later in the Theoretical Framework 5.2.2 via Hernes et al., (2015) change dimension called *heterogeneity of factors*.

By starting at a macro-level, technological trajectories are located in the socio-technical landscape Geels (2002). The symbol of landscape shall be seen as a metaphor for the context of society, which creates a frame where multiple actors, both human and non-human exist. The technology factors on the landscape level are widespread and established, which makes them robust Geels (2002). Therefore, change at this level appears in slow pace and can be exemplified by for example cultural changes, politics or demographic trends. These types of changes further put pressure on the next level, namely the meso level of regimes.

Socio-technical regimes are defined as "semi-coherent rules carried by different social groups" (Geels, 2002, p. 1260). These regimes are characterized by dynamic stability where innovation still can take place, but mostly the incremental kind. Thus, the socio-technical regimes can explain the stability of socio-technical configurations as they are a result of the links created between different actors in the context (Geels, 2002). The socio-technical regime includes seven different dimensions: *user practices, technology, markets, symbolic meaning of technology, infrastructure, industry structure, policy* and *techno-scientific knowledge* (Geels, 2002). These elements and the links between become established by the social groups that produce and reproduce them. Hernes et al. (2015) refer to these repeating acts as *pattern of interacts*, which will be further elaborated on in Theoretical Framework 5.2.3.1. Geels (2002) exemplifies the interconnected dimensions by explaining how the government outline regulations and create an infrastructure in society. Further, he highlights how media and societal groups create symbolic meaning around technologies. Moreover, he underlines how the companies create strategies and thereby position themselves on the market (Geels, 2002). This leads to an industry structure where technological knowledge gets materialized. This demonstrates how the elements co-ordinated (Geels, 2002).

On the next level, in niches, radical innovation appears (Geels, 2002). This takes place as the context is more protective, which hinder radical ideas from being abolished directly. The protective environment of the niches creates space for ideas and their initiators to build up a social network that

can be supportive of the innovation, as for example relationships with producers and customers (Geels, 2002). The process of a technology to move from a niche to a regime is defined as *niche-cumulation* and occurs gradually (Geels, 2002). This occurs as radical innovation is applied in other niches, which creates an accumulation affect, which further allows it to become a technical trajectory. Moreover, niches can be created by landscape developments (Geels, 2002). Two mechanisms that can generate the breakthrough of a radical innovation are identified (Geels, 2002). First, if the innovation is interpreted as a *technological add-on* and *hybridization* by solving a bottleneck, it creates the opportunity for new and old technology to co-exist. Second, technology can gain recognition if the innovation breaks out of a niche and follow the growth in a specific market.

The three levels of technological transition are interrelated and have an embedded hierarchy (Geels, 2002). The macro level of the landscape emphasizes slow change in external factors. The meso level of the regimes indicates stability around existing technology development and trajectories. The micro level of the niches highlights how change takes place through radical innovation (Geels, 2002). New technology is developed by the slower changes in the landscape and regimes. Hereafter the niches follow an alignment – both upwards and downwards, as these processes are ongoing (Geels, 2002). Therefore, radical innovations also break out from niches as the continuously changing regimes and landscape open up and create opportunity for the innovation to come through. These innovations can also evolve as a result of how openings are created from tensions in the regime caused by a shift in the landscape that creates pressure on the regime. Thereby, Geels (2002) see technological transitions as an outcome of the different links that are created between developments at the different levels. This embeddedness of the levels and the two-way direction of the technological transition have been claimed by authors as not sufficiently explained. Due to this critique, Geels wrote an article called "*The multi-level perspective on sustainability transitions: Responses to seven criticisms*" (Geels, 2011) More specifically Berkhout, Smith and Stirling (2004, mentioned in Geels, 2011) argue that the bottom-up change processes were more emphasized then the bottom-down ones. Geels (2011) agreed as he often highlighted how radical innovations emerged from niches before entering the market and replacing the current regime.

As a response, Geels and Schot (2007, mentioned in Geels, 2011) made a distinction between the nature (competitive or symbiotic) and the timing of the interactions of the levels. Thereby, they developed four transition pathways: t*ransformation, reconfiguration, technical substitution* and *de-alignment/re-re-alignment* in order to highlight the dual direction of technological transitions. The pathway of transformation underlines how transitions occur when landscape developments create

pressure on the regime, as the niche-innovations are not thoroughly developed (Geels, 2011). This causes the actors in the regimes to alter the innovation to respond to the pressure from the landscape. The pathway of reconfigurations is characterized by how the innovations taking place in niches become more advanced when landscape development stress the regimes (Geels, 2011). Further, a symbiotic nature of the niche-innovation generates the possibility for the regime to utilize the innovations to solve issues in the present regime. Technological substitution represents a pathway characterized by niche-innovations that are advanced as landscape development put pressure on the regimes (Geels, 2011). The internal tension that is created in the regime then creates a possibility for niche-innovations to come forward and replace the old one (Geels, 2011). The last pathway, de-alignment/re-alignment is represented by how pressure from the landscape creates a decomposition of the regimes, in other words, de-aligning it (Geels, 2011). Thereafter, the landscape utilizes this created space for different niche-innovations to come through and co-exist for a while and thereby create uncertainty of which is the dominant (Geels, 2011). Hereafter, one innovation will turn out as dominant and create realignment as a new regime is born. These four pathways once more underline how embedded the different levels are and how technical transitions can develop from different directions.

Hereby, circular economy (Pearce & Turner, 1990) can be exemplified by Geels' (2002) description of technological transitions. To apply circular processes, create major changes within societal systems in order to function. Geels (2002) describe this process in the regimes as a dynamic process of reconfiguration without sudden shifts. This process view aligns with Hernes et al.'s (2015) view on change processes that will be outlined in 5.2.

5. Theoretical Framework

In order to analyse the outlined research question and its sub-question, mentioned in 1.1.1, the following theoretical framework is created. Borland et al. (2016) is utilized in order to investigate how managers, as the ones in KLS PurePrint, create sustainability strategies based on their world view. Moreover, their theory will be helpful to explore what dynamic capabilities that were needed by KLS PurePrint's management team in order to develop the sustainability strategies. In the following, Hernes et al. (2015) will be utilized to investigate the process of strategic implementation and the necessity of sensemaking in order to undergo the change. The integration of these two frameworks creates a possibility to evaluate the developed internal strategies and the following internal process undergoing a transformational change towards circularity.

5.1 Strategy Development for Ecological Sustainability

Borland et al. (2016) have created a framework for managers and companies to ease the process of recognizing, classifying and applying internal business strategies to achieve ecological sustainability. In order to do so, Borland et al. (2016) examine the intersection of ecological sustainability and strategic management, and more particular, the dynamic capabilities that were originally made known by Teece (2007).

5.1.1 The Disparity between Sustainability and Ecological Sustainability

The term of sustainability is a term broadly used in today's society and described as an ongoing phenomenon (Borland et al., 2016). The term is often mentioned by academia and companies as a trait describing something that can be maintained for a long time, as for example being economically sustainable (Borland et al., 2016). The word is also utilized in ecological science to describe a closed loop system (Webster, 2017) meaning that it can maintain itself in an unlimited time with only the sun as a source (Borland et al., 2016). Borland et al. (2016) refers to this type of sustainability as *ecological sustainability*, which their theory is focused around. The area of ecological sustainability stems from different disciplines as biology, chemistry and physics that all derives from natural science. Borland et al. (2016) undertake this area of sustainability since it is becoming more

acknowledged in the world of businesses and since they think that there is a lack of research that supports this assumption of sustainability and how they affect strategic orientation.

5.1.2 The Anthropocentric and the Ecocentric World View

Borland et al. (2016) differ between two fundamentally contrasting philosophical assumptions about the natural environment and its species, namely the *anthropocentric* and the *ecocentric world view*. The anthropocentric world view underlines that nature mainly exists for humans to utilize it and that it provides them with opportunities to make progression (Borland et al., 2016). This philosophical assumption is also highlighted by Pearce and Turner (1990), who describe it as a traditional linear economics. Thereby, humans are free of responsibility towards the constraints of nature, which reconnects to Figure 2 of input and output without including the environment (Pearce & Turner, 1990). Borland et al. (2016) argue that this perspective can be seen as a demonstration of the Western world, which has a belief in unlimited growth, limited governmental involvement, prosperity and private property rights. Deriving from the anthropocentric world view, land that is not used is seen as an opportunity being wasted (Borland et al., 2016). The limitations with this view are that it has no natural endpoint of consumption, except for when the natural resources are exploited. This creates a hierarchy between the species of the world where humans see themselves as above the rest. This has developed a cultural norm that becomes the *dominant social paradigm*, which becomes legitimized and accepted in the world (Borland et al., 2016). This dominant social paradigm can be further emphasized by Geels's (2002) definition of a regime mentioned in 4.1 Further, the dominant social paradigm implies that when sustainability is mentioned in terms of sustainable development, it emphasizes an anthropocentric world view since it "primary focus on human development" (Borland et al., 2016, p. 295).

The ecocentric world view shifts this focus around since it is characterized by the assumption that ecosystems have an essential value for protecting and cultivating all life on earth (Borland et al., 2016; Pearce & Turner, 1990). This implies that human's cultural systems must be able to function in alignment with other ecosystems and their limits. This associates with the Figure 4 of the material balance model, which underlines that there is no hierarchy present between the species in the world (Pearce and Turner, 1990). The ecosystems therefore express a need for a more holistic view, where humans are decentralized from the system (Borland et al., 2016). This means that human development is accepted as long as it is does not interfere with the dynamic ecosystem, where organisms live in

their own niches in closed loops. This implies that ecological sustainability is ecocentric as Borland et al. (2016) explain it as ecological sustainability "puts all species on equal footing and thereby includes the balance of nature and human development in perpetuity" (p. 295). It should be highlighted that two world views of sustainability outlined by Borland et al. (2016) are both extremes on a continuum, which entails a *paradigm incommensurability*. The paradigms continuum enables companies to generate "potential movement through developing (or changing) viewpoints, beliefs, values, and attitudes" (Borland et al., 2016, p. 296). This creates the opportunity for companies to assess and position themselves in order to create change. Therefore, the ecocentric and the anthropocentric shall not be seen as the only world views possible.

5.1.3 Strategy for Ecological Sustainability

Borland et al. (2016) approach strategic management in order to create an understanding of how companies are involved in the quest of economic sustainability. Hence, they apply the dynamic capabilities that highlight an internal perspective of a company. They differ between three different types of strategies: *traditional*, *transitional* and *transformational* Borland et al. (2016). Borland et al. (2016) underline that traditional strategies are not concerned with ecological sustainability since they see the nature and companies as two separated systems where it is assumed that company can continue their processes without putting pressure on the ecological systems. This implies are linear and static framework, mentioned earlier by Pearce & Turner (1990) in 3.1, as it does not close the product loop by handling the waste that is created by the product. This linear process is defined as a cradle-to-grave process and emphasizes an anthropocentric perspective (Borland et al., 2016). In order to approach ecological sustainability, Borland et al. (2016) suggest two alternatives to the traditional strategy, namely transitional and transformational strategy.

Transitional strategies still emphasize a linear approach as it also follow the cradle-to-grave system. However, transitional strategies approach sustainability by introducing the *transitional 5Rs* of *reduce*, *reuse, repair, recycle* and *regulate* (Borland et al., 2016). Borland et al. (2016) describe that reducing includes to reduce the amount of material that are used when producing a product. Reusing includes to reuse materials but also products in order to decrease the demanded volume and to maximize product's utility (Borland et al., 2016). Further, they describe that products often can be repaired and thereby be reused, rather than being discarded (Borland et al., 2016). The fourth transitional R of recycling, mentioned by Borland et al. (2016), represents that the product should be recycled, unless it can be repaired or reused. At last, Borland et al. (2016) highlight how regulations are implemented

to manage control over waste activities. Borland et al. (2016) argue that the transitional 5Rs help companies to make a reduction in use of rare commodities and consider the issue of waste but the products are still produced conventionally by companies in a closed system without taking the nature into primary consideration Borland et al. (2016). The 5Rs are created to work as an add-on to strategies to deal with issues that become salient in connection to products (Borland et al., 2016). In other words, they help companies to do less bad and slow down their damage rate. However, this is not enough to fully embrace circular economy, and the value circle illustrated above (Figure 5), as it is only a reductionist approach. Since transitional strategies emphasize a resource focus, they are in some way concerned with the nature but with a linear approach. This makes these types of strategies static and they are not concerned with creating a positive impact and a circular system, which implies a need for transformational strategies (Borland et al., 2016; Braungart et al., 2007).

The transformational strategies, mentioned by Borland et al. (2016), stem from ecocentric values and thereby embrace ecological sustainability by seeking to eliminate for example toxic chemicals in the product cycles. This can be done by including biomaterials in the product cycles and by aiming at achieving eco-effectiveness that is highlighted by Braungart et al. (2007). A way to achieve this is to imitate the nature's own cycles, which highlights a cradle-to-cradle process where the product loops are closed but there is an open system between humans and nature (Borland et al., 2016; Braungart et al., 2007). In order to achieve this, there is a need for a sustainable vision that drives a managerial mindset, which ensures that there is no separation between humans and the nature. This generates the possibility for companies to engage in collaborations in order to create innovative processes. Borland et al. (2016) also underline the commercial benefits that come along with implementing a transformational strategy, namely a commercial image towards external stakeholder but also the reduced cost for continuously buying new raw material and for dealing with waste from the product cycles.

5.1.4 The Ecocentric Dynamic Capabilities

According to Teece (2007), the original dynamic capabilities create a three-step process. Namely to have "the capacity to *sense* and shape opportunities and threats, to *seize* opportunities and to *maintain* competitiveness" (Teece, 2007, p. 1319). Further, these capabilities should be hard to replicate. He further describes how competitive advantages are temporary due to a continuously changing world. This highlights an active aspect of the dynamic capabilities that has to be retained, which aligns with Hernes et al. (2015) view on ongoing change. This process view of change will be outlined in 5.2.

Moreover, successful coordination of these capabilities can reinforce a greater long-term financial performance (Teece, 2007).

Borland et al. (2016) highlight on how the dynamic capabilities need to be expanded in order to be utilized by companies that has or want to transform to have a primary focus on achieving ecological sustainability. This is since Teece's (2007) focus is to create financial performance and do not include the biological ecosystem. Therefore, Borland et al. (2016) add the notions of *remapping* and *reaping*, which can be applied to the transformational strategies, since they embrace the ecocentric perspective. This creates a view of a company that includes the external world of the biological ecosystems. Remapping implies to close the loop of the product that is produced, by differentiating technical and biological materials in the process and rechannelling the waste in a proper manner (Borland et al., 2016). Reaping is a capability that demands the managers to be able to benefit from the circular approach that takes place in the company in additional ways to financial profit as for example status and the process of opening up for new collaborations (Borland et al., 2016).

After including remapping and reaping to the ecocentric dynamic capabilities, they can be applied to what Borland et al. (2016) presents as the *5Rs* for *transformational strategies.* The transformational 5Rs is a framework that expresses five different transformational strategies with an ecocentric focus. They consist of *rethink, reinvent, redesign, redirect* and *recover* (Borland et al., 2016). Rethinking requires the company and the managers to entirely rethink the concept of their product in order to rethink the way of fulfilling this function with a cradle-to-cradle approach (Borland et al., 2016). Reinventing is an innovative process where the ideas are shared and well discussed (Borland et al., 2016). This part of the process might include use of technology and collaboration with other organizations. Redesigning takes part when the company has identified their new concept and when it has to be adjusted to the ecological requirements by including technical or biological materials solely (Borland et al., 2016). The next R is redirect, which is taking place at the end of the life of the product. This includes having specific and separated channels for the waste materials. One for the technical materials so that it can be redirected into the technical cycle and one for the biodegradable materials that can be let back to the nature without causing any harm (Borland et al., 2016). The last step is called recover, which includes recovering rare materials and using them in another ways, either in new production or for a completely new market (Borland et al., 2016). This creates the opportunity to keep the market value of the material but still closing the loop of the product, which is the main purpose of a cradle-to-cradle process. Borland et al. (2016) argue how the ecocentric dynamic capabilities and the transitional 5Rs can be directly mapped onto each other (Table 2). By doing this,

managers can practice ecocentric leadership, which creates the opportunity of the company to generate competitive advantages.

Ecocentric Dynamic Capabilities		Transformational 5R's
Sensing	⟷	Rethink
Seizing	⟷	Reinvent
Maintaining	⟷	Redesign
Remapping	⟷	Redirect
Reaping	⟷	Recover

Table 2: Integration of the Ecocentric Dynamic Capabilities and the Transformational 5Rs (Based on Borland et al., 2016)

Further, Borland et al. (2016) highlight the importance of a managerial mindset in order to work towards ecological sustainability. This includes being able to analyse the ecological sustainability of their own company, but also how to reconstruct their strategies and vision into ecological sustainable ones. The mentioned remapping and reaping underline this importance of managers in the company (Borland et al., 2016), since a transformational strategy is moving beyond the dominant social paradigm, the anthropocentric world view, that is the norm of cultures in companies. Therefore, the employees need someone to lean back on and trust in term of making sense of this turbulent process. The utilization of Hernes et al. (2015) and their process view on change can therefore create a deeper understanding of strategic implementation and the necessary sensemaking to integrate a circular approach in a company.

5.2 The Process of Change and Sensemaking

Hernes et al. (2015) emphasize how it is beneficial to analyse change via process thinking as it enables the investigation of the dynamics of change process and what drivers that stand behind it. By applying sensemaking to the processual view of change, Hernes et al. (2015) exemplify how change can turn out differently depending on the processes.

5.2.1 Change

Hernes et al. (2015) view change as ongoing that cannot be divided into periods. They are therefore sceptical towards the fact that companies still are viewed as stabilized systems of activity, with the need to adapt to the external environment. Hernes et al. (2015) underline that change is something that is supposed to be observed as fluid and complex, that does not exist in systems and structures. Thereby, the focus is to be directed towards the forces, which are driving change and how these are continuously interacting in order to develop the focal point of the change process. Hernes et al. (2015) are thereby investigating the movements and the flows, which facilitates the possibility to apply the framework of sensemaking. This is as the framework also sees change processes as something without a start or an end, but rather as something that takes place in the middle of the flow of possible actors and consequences (Hernes et al., 2015). Therefore, this mix of approaches can help to highlight the flowing nature of change and to understand change in a process perspective.

5.2.2 Dimensions of Change

Hernes et al. (2015) define four dimensions of change, which build the basis for the sensemaking framework. The four process dimensions of change are guiding the process of change and are not excluding each other. They are defined *as contingencies of change, forces at work, heterogeneity of factors* and *temporalities of change* (Hernes et al. 2015).

The first dimension, *contingencies of change*, refers to how different events affect each other and how the change process will turn out, but also how they at the same time are connected to what Hernes et al. (2015) call antecedents. Contingency implies how different patterns of events turn out to influence the course of change or in other words, how smaller events can create the foundation for a bigger change and thereby unfold the change process. This means that Hernes et al. (2015) define change as forever evolving by being influenced by smaller, ordinary events that take place on a daily basis. Hernes et al. (2015) connect sensemaking to this part of the change process by highlighting how sensemaking also is an ongoing process that is based on actions and interpretations. Further, they underline how these actions are unpredictable and thereby can change the meaning and the course of the change. Likewise, sensemaking is connected to contingency since it always demands justification, which often is achieved by looking backwards on past events but is needed in order to set the stage for new acts Hernes et al. (2015).

The second dimension defined by Hernes et al. (2015) is *forces at work*, which concern how change can be seen as a type of activation of forces in the middle of ongoing activity. Here, the forces should be seen as multiple and moving in a field creating energy in an ongoing process. This implies that they are dynamic and are gradually building up, which adds further drive to already existing forces. Hernes et al. (2015) argue that change shall be seen as spiral shaped, and not linear, since it is ongoing. Hernes et al. (2015) connect sensemaking to this part of a change process by highlighting how narratives are driving commitment towards change by helping individuals to go beyond the present moment. Further, they see the narrative as a dynamic force as it is a driver for connecting people and events towards the direction of the specific change. Thereby, Hernes et al. (2015) see the unfolding of the change as dependent of how the narrative are activated.

The third dimension defined as *heterogeneity of factors* (Hernes et al., 2015). This dimension underlines how both organizational and institutional factors influence the power of change, in other words – both human and non-human actors. This dimension therefore aligns with Geels's (2002) view of how social and technical elements are affiliated and how they can generate change of one another, as mentioned previously in 4.1. Hernes et al. (2015) call these actors arbitrators and see them as connecting the processes and thereby framing the change. By connecting the heterogeneity of factors with sensemaking, Hernes et al. (2015) highlight how institutional factors help to create the context that the organizational factors are a part of and thereby help to make sense of the situation on a micro-level. The inclusion of both organizational and institutional factors opens up for the understanding of how different factors penetrate organizational change processes, which for example takes place when narratives are being utilized during the process of change.

The fourth and last dimension of change, namely *temporalities of change*, is characterized by the role of both the past and the future during change (Hernes et al., 2015). Hernes et al. (2015) emphasize how fragile the world is by underlining how easily it can change due to that it is being constantly reinterpreted by the future possibilities. This view includes company's past as it reinterprets its future when going through strategic changes, which emphasizes a temporal view where the past and the present are interwoven (Hernes et al., 2015). In terms of sensemaking, this dimension helps to explain that sensemaking takes place both in terms of retrospective and prospective when justifying situations. (Hernes et al., 2015) underline how individuals always try to make sense of the present situation they are in and in order to do that they include the past to justify it and to carry on and making sense towards future.

5.2.3 Sensemaking

Hernes et al. (2015) argue that sensemaking can be seen as a part of process theory, since it can be included in the four dimensions outlined above and as it focuses on meaning creation through human and non-human interactions. Thereby, Hernes et al. (2015) demonstrate how a processual view of change with its four dimensions displays the basis of using sensemaking in order to perform more close analysis of specific organizational changes. Hernes et al.'s (2015) framework is inspired by Weick (1993; 1995, mentioned in Hernes et al., 2015) and shall be seen as an extension as it includes links between the between the different processes of sensemaking. These links are *interacts*, *patterns of interacts*, *social commitment, interpretative commitment* and *narrative* (Figure 6). These processes shall be viewed as interlinked and open for change but still separate (Hernes et al., 2015). The main assumption behind the framework is that meaning and commitment is driven by interacts and evolving patterns of interacts (Hernes et al., 2015). Further, narratives generate social and interpretative commitment towards the change as it creates space for new interacts to take place.

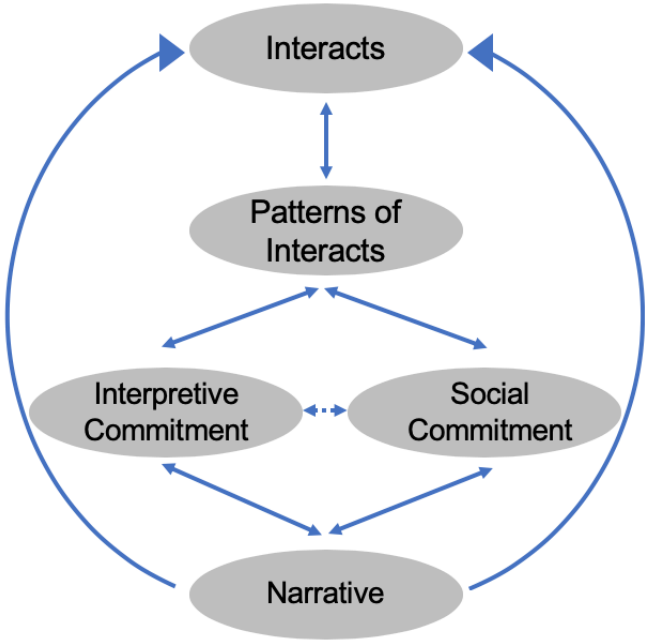

Figure 6: Sensemaking Framework (Based on Hernes et al., 2015)

5.2.3.1 Interacts and Patterns of Interacts

Hernes et al. (2015) describe how interacts are created by individual acts, which can be both *verbal* and *non-verbal*. Such interacts between various human and non-human actors set the base for new interacts to take place within the creation of a narrative (Geels, 2002; Hernes et al., 2015). The interaction between various actors connects to the third dimension of change called heterogeneity of factors, as they become important drivers during the change. When individuals acknowledge and reacts to each other's acts, patterns of interacts appear. These patterns can be reciprocal as they move further than just being present in the specific situation (Hernes et al., 2015). And if these interacts are repeated, they become habitual and expectations of patterns might be created. This is connected to the dimension of change one, contingencies of change. Actions and interpretations set the stage for further actions and interpretations to follow within the ongoing change. Moreover, Weick (1995, mentioned in Hernes et al., 2015) emphasize how acts are irrevocable, explicit and public, which further generate behavioural commitment that is described in the following. This could further be referred to the moment, when strategies are determined, due to the fact, that this action materializes knowledge (Geels, 2002).

5.2.3.2 Commitment

Hernes et al. (2015) argue that the commitment needs to be broader established in order for sensemaking to become self-generating. Thus, they distinguish between two different types of commitment, namely *social commitment* and *interpretive commitment*. Social commitment is when a social group is connected to a narrative via socially binding interacts (Hernes et al., 2015). This can take place by the feeling of sharing some sort of identity with a social group, which makes the actors feel connected to the change via the commitment. Interpretative commitment is when the individuals feel committed to the underlying idea of the change process (Hernes et al., 2015). Interpretative commitment is not dependent on social commitment, as actors might get attached to a certain idea without feeling a stronger connection to a common identity. Both social and interpretative commitment is bound together by actions and actors and the cause that they are a part of. Commitment does sensemaking difficult to disentangle and create momentum towards change (Hernes et al., 2015). This displays how commitment drives momentum within change, as mentioned within the dimension of forces at work.

5.2.3.3 Narrative

Hernes et al. (2015) describe how interacts are a part of producing and reproducing narratives and argue that it is when narratives become stabilized in the local context that they influence future acts of human actors. Therefore, this micro stability can be seen in between the continuously ongoing change as highlighted by Geels (2002) in regards to technological development within the regimes. Hernes et al. (2015) further underline how narratives are an important driver for sensemaking to take place, as it helps actors to make sense of other actors, which can be critical during a change process. A narrative continuously impacts the patterns and further create the momentum for social and interpretive commitment towards the change process. Therefore, the narrative refers to the dimensions of contingency of change, forces at work, as well as temporalities of change. This is due to that narratives unfold possible momentums of change, as they evolve upon past events leading towards the future.

Søderberg (2006, mentioned in Hernes et al., 2015) argues that collective narratives allow people to create meaning, especially from key actors and important events during the change process. This follows the dimension of heterogeneity of factors, as such events display an important arbitrator during the process. At last, Hernes et al. (2015) argue that narratives shall not be seen as fully comprehensive as they rather provide a suggestion of an interpretation and meaning of the specific context by a specific group of actors.

5.3 Theory Integration

The previously described theories of Borland et al. (2016) and Hernes et al. (2015) within the theoretical framework will be made use of to answer the research question and its sub-questions. This will be performed by following the three areas of world view, strategy, dynamic capabilities and sensemaking. The integration between the three areas will be described in the following.

Borland et al. (2016) describe managers' view of sustainability and the resulting strategy. Further, they highlight what dynamic capabilities are needed to approach both anthropocentric and ecocentric sustainability. The objective of applying Hernes et al.'s (2015) framework of sensemaking to Borland et al. (2016) is to explore how sensemaking is utilized when a company transform their world view, hence their strategy. The dimensions of change will be utilized in order to identify human and non-

human actors and their impact on the sensemaking during the change process. This will allow for an identification of important momentums evolving around specific events during the change process, that lead into the sensemaking exploration. Thereby, the integration of Borland et al. (2016) and Hernes et al. (2015), allow for an in-depth analysis of the ongoing sensemaking around the change process throughout a company. This integration will be used as the bases to approach the case of KLS PurePrint in the Analysis 7.

6. Methodology

In the following, the methodological approach of this study will be described. This will be done by arguing for the utilization of a case study approach and how this has affected the design of the research and its philosophical foundation. Furthermore, the limitations of the case study will be outlined.

6.1 A Case Study

The study at hand is a case study as it involves a close examination of the phenomenon of sensemaking during a strategic change process towards circularity in KLS PurePrint from 2007 and onwards (Yin, 2003). The study can further be defined as a case study due to three characteristics. Frist, the stated research question emphasizes how this case study took an explorative approach as the objective was to explore the specific context of the company KLS PurePrint and to develop applicable interpretations for further examination (Yin, 2003). Second, the case of KLS PurePrint is a contemporary event, which made it possible to directly examine it in its living form but also to gather data, via interviews, from individuals who are part of it (Yin, 2003). Third, our role as researchers has limited influence over the context that is being examined as the study is exploratory and not explanatory (Yin, 2003). Therefore, a research strategy developed for case studies can be argued to be beneficial for this specific study as it creates the possibility to view both the managerial and the change process that have been taking place in KLS PurePrint (Yin, 2003). In other words, it allows for the contextual conditions of KLS PurePrint to be uncovered and to be better understood. These contextual conditions are built up on several sources of data that needed to coherent with each other in order to be viewed as findings (Yin, 2003).

Further, this case study can be categorized as a representative single case as the goal was to generate an understanding of the characteristics of a common organizational situation of a strategic change process and to spread knowledge about it (Yin, 2003). Moreover, this case study is a holistic case study as it focused on the single unit of KLS PurePrint (Yin, 2003). In order to prevent the risk of only scratching on the surface of KLS PurePrint, sub-questions were presented following the research question. These guided the research path to subunits of the company, which enlarged the observations and led the analysis to a deeper level. At last, an initial meeting was held with the contact person from KLS PurePrint in order to minimize the vulnerability of utilizing solely one case and the risk of the

case study to shift direction due to surprising findings (Yin, 2003). This increased the chance of representing the actual case and thereby not study it further if the strategic change process towards circularity was not present.

6.2 Research Design

This exploratory case study has been designed in order to connect the stated research question to the final conclusions. A research design is a plan that "guides the investigator in the process of collecting, analysing, and interpreting observations" (Nachmias and Nachmias, 1992, as cited in Yin, 2003, p. 21). Yin (2003) further emphasizes the importance of research design, especially for cases studies, since there is no blueprint to follow. The elements that are essential for research design of case studies are: t*he research question of the case study, the sub-questions, the unit of analysis, the logic and method that creates a link between gathered data* and *the research question* (including sub-questions), and *the quality criteria* for interpreting the findings from the data (Yin 2003). Afterwards, the five elements will be connected to this case study's research design.

The research question of this case study highlights its explorative focus. The sub-questions have been outlined in order create awareness about deeper issues and complexities that are embedded in the same context as the research question (Yin, 2003). The unit of analysis in this case study has been defined as the phenomenon of sensemaking during a strategic change process towards circularity in KLS PurePrint initiated in 2007 and has been described in the Case Description in chapter 2. This has created a research frame around the specific context of KLS PurePrint and the individuals in the company that are and have been part of the process. Further, the unit of analysis enabled to focus the data collection process, as it created a scope for both time and space within KLS PurePrint (Yin, 2003). The methods for gathering, processing and coding data will be outlined below. At last, the quality criteria of *construct validity*, *external validity* and *reliability* will be applied in order to assess the quality of the interpretations that has been made from the gathered data (Eisenhardt, 1989; Yin, 2003).

6.2.1 Qualitative Approach

By collecting data through a qualitative research method, it was possible to explore the phenomenon of the strategic change process towards circularity that was initiated in KLS PurePrint 2007 (Justesen

& Mik-Meyer, 2012). This emphasizes an inductive approach as the objective of this case study was to view and explore the specific context of KLS PurePrint (Egholm, 2014) . The primary data for this case study was gathered by conducting interviews and was complemented by secondary data in terms of external articles and internal documents. This allowed for the creation of a nuanced illustration in order to view the phenomenon of sensemaking during a strategic change process towards circularity.

6.2.1.1 Data Collection

Primary Data

Primary data was gathered by conducting multiple interviews at KLS PurePrint's facilities in Hvidovre, Denmark. The interviewees were selected in order to cover different hierarchical levels of the company and are represented by top management, middle management and employees. In order to become an interviewee, it was demanded that they had been a part of KLS PurePrint before and during the strategic change process. This was in order to get a clearer perception of how the implementation of the strategy went by and to get the possibility to gather several opinions about it. The interviewees are outlined in the table below (Table 3).

TITEL	EMPLOYED SINCE	CONDUCTED ON	LANGUAGE	APPENDIX
CCO	2001	13th March 2019	English	Appendix 1
Sales Manager	1999	15th March 2019	English	Appendix 2
Sales Director	1980	15th March 2019	English	Appendix 3
Production Employee	2000	15th March 2019	Danish	Appendix 4
CEO	1972	22nd March 2019	Danish	Appendix 5
Chairman	2006	28th March 2019	English	Appendix 6
CCO – follow up	2001	1st May 2019	English	Appendix 7

Table 3: Overview of Conducted Interviews

During the selection process of interviewees, the contact person was requested about the possibility to interview a director and employee from the Sales Department and the Production Department. They were selected in order to cover, how two different departments worked differently with the implemented strategy and certification. This was due to the fact that the Production Department solely focuses on internal work but as the Sales Departments focuses externally towards customers. However, the specific interviewees were also selected based on their availability for the interviews. Most interviews were conducted in English and in moments of doubt, Interviewer 2, who is fluent in Danish, translated the question and allowed for Danish answers. Two interviews were conducted in Danish due to the level of English of the interviewee. This enabled more clear and specific answers, as a language barrier did not limit the interviewees. Furthermore, the duality of researchers enabled a broader spectrum of findings to be enhanced due to the two individual perceptions (Eisenhardt, 1989).

The interviews were conducted by utilizing a semi-structured interview guide (Justesen & Mik-Meyer, 2012), which created room for unforeseen insights and discussions that arose during the interviews, which in turn is helpful in explorative studies as this one. The interview guides consisted of questions both regarding the past and the present in order to approach the full strategic change process that started in 2007. Further, the interview guides were adapted to the specific interviewee and their role within KLS PurePrint but were still concerning the theoretical framework of the case study. This highlights the explorative approach towards the phenomenon of sensemaking during a strategic change process towards circularity and the specific context of KLS PurePrint. Furthermore, the interviewees were not informed on specific details regarding the interview topic beforehand in order to increase the possibility of straightforward answers. All interview guides are attached in Appendix 10.

The first interview respondent was the Commercial Chief Officer (CCO) of KLS PurePrint who also served as the contact person to this specific case study. One of the researchers met him during a Global Compact Network presentation in Bagsværd. An initial meeting was conducted with him in January 2019 where the Master Thesis collaboration was agreed upon. He has been working for KLS since 2001 and started his careers as a Commercial Financial Officer (CFO) but has been the CCO since 2006 (Appendix 1). Furthermore, he is the grandchild of the founder of KLS PurePrint. As the initial contact person to this case study, he can be portrayed as both the entry point and the gatekeeper in the process of researching. Further, this interview was of the explorative type as it was the goal to get a broader insight in the specific context of KLS PurePrint and to create a more general

understanding of the change process they have been through since 2007. This initial insight fine-tuned the focus of the following interviews of the research. Furthermore, a follow up interview was conducted later during the writing process (Appendix 7). This was in order to ask follow up-questions that were still unclear but provided important details for the case study. Moreover, smaller follow-up questions were answered via an email from the CCO (Appendix 9).

The second interview respondent was a sales manager of KLS PurePrint, which has been working within the Sales Department since 1999. It should be mentioned that the title Sales Manager corresponds with being an employee within in sales, as he has no managerial responsibility. He was chosen as a relevant actor within the Sales Department, since he has been a part of the KLS PurePrint during the entire timeframe. He could therefore provide insight to how the Sales Department has interpreted and implemented the strategies on an employee level (Appendix 2).

The third interview respondent was the Sales Director of KLS PurePrint, who is the superior of the Sales Manager. The Sales Director has been employed by KLS PurePrint since 1980 and started out at a young age as an errand-boy and cleaner and has advanced to managerial level (Appendix 3). This career path and its length within KLS PurePrint allowed for overarching knowledge of the company and since it created further insights into the implementation of the sustainability strategy on managerial level.

The fourth interview respondent was a production employee of KLS PurePrint who has been working as a printer since 2000 (Appendix 4). This role implies him taking responsibility of a specific part of the production process. The employee has not changed position during his employment and has therefore not had any managerial positions within KLS PurePrint. The interviewee requested to fully conduct the interview in Danish, as he felt more secure with that language. Since speaking English would have limited his possibility to answer the questions, his request was agreed upon. The interview took place during a break down of a machine, which made it was possible to have an interview without being interrupted by any work.

The fifth interview respondent was the Chief Executive Director (CEO), who is further responsible for the Production Department of KLS PurePrint. He has been with KLS PurePrint since 1972 and the CEO since 2008 and is one of the sons of the founder (Appendix 5). He started in the company as an apprentice and has worked within different departments and advanced to top management. This allowed for further insight into the strategic change process. Moreover, the interview was conducted in Danish due to his level of English.

The sixth interview respondent was the Chairman of KLS PurePrint who has been in that position since 2006 (Appendix 6). He joined the Board of Directors after he finished an MBA at Henley Business School in London. The Chairman was not appointed as an initial interviewee but was a person who was referred to several times during the other interviews. Hence, his role was interpreted as important during the change process and he could therefore enrich the data with information for a top management perspective.

Data collection was completed due to two reasons. First, when further interviews where denied. This was the case with Board Member 2. She was contacted several times via phone and email and agreed to answer interview questions via email. Unfortunately, no answers where received. Secondly, point of saturation regarding data was reached when the comparison of new interview data did not generate any unexpected findings.

Secondary Data

Secondary data was collected in order to supplement the primary data. ´The secondary data consisted of both internal and external material. The internal data consisted of strategic documents, articles and YouTube-videos. This data was gathered in order to get a richer insight into KLS PurePrint and how they express themselves and their strategic change process towards circularity. The external data consisted of news articles, academic articles and consultancy documents. These were utilized in order to get a greater understanding of KLS PurePrint and the print industry in Denmark. Moreover, this external data created a more nuanced perspective of KLS PurePrint as external authors wrote them.

6.2.1.2 Data Analysis

To start the data analysis, the gathered data had to be coded, in order to explore the beliefs, values and behaviours of the interviewees. Saldaña (2013) refers to coding, as the process that allows researchers to firstly get individually familiarized with the data before diving deeper through a first and second coding cycle. The first cycle of coding is necessary to grasp the amount of data, whereas the second cycle of coding approaches the analysis of the data (Castleberry & Nolen, 2018a; Saldaña, 2013). This was facilitated by a thematical coding process including a five-step approach: *compiling, dissembling, reassembling, interpreting* and *concluding* (Castleberry & Nolen, 2018b). Within this type of coding, the compiling and dissembling process were seen as the primary coding stage, which

was pursued in a deductive matter driven by the theory. As secondary coding, the reassembling and interpreting, was inductively driven by the insights from the data. Thereby, the data analysis was an iterative process, including both inductive and deductive elements. The five steps will be elaborated in detail below as well as highlighted within the overview of the process in Figure 7. Further, more information and the pictures in Figure 7 can be found in the Appendix 11, were the entire coding is displayed.

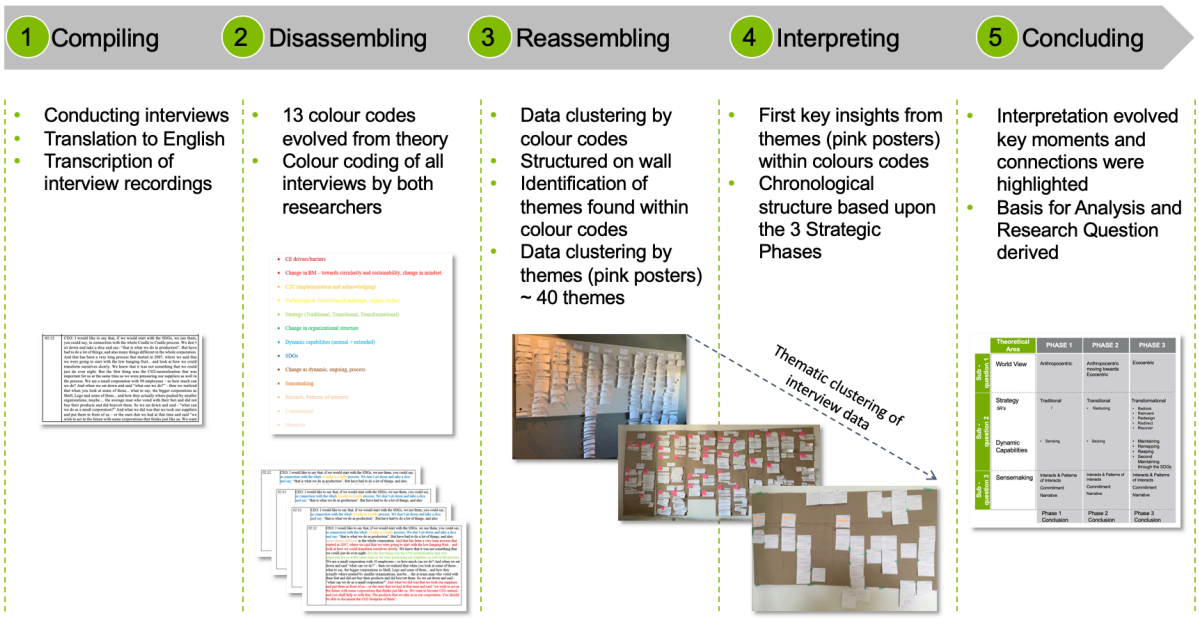

Figure 7: Coding Process Overview (Based on Castleberry & Nolen, 2018)

Firstly, the data was compiled (Castleberry & Nolen, 2018b). The conducted interviews were recorded and afterwards transcribed in order to allow an in-depth analysis. The interview with the Production Employee and the one with the CEO were conducted in Danish and therefore directly translated to English during the transcribing process, in order to be understood by both researchers. Through the process of transcription, a deeper understanding was received after having conducted the interviews, which created necessary insights for the following four steps of the coding.

As the next step, data was assessed for the first time, meaning that transcriptions were highlighted through thirteen different colour codes (Appendix 11). An example of how this is illustrated in Figure 8 below. Such thematical codes were mainly developed by the theoretical framework's key themes beforehand. This coding process was pursued by both researches, analysing the transcribed interviews after each other as the second step – the disassembling (Castleberry & Nolen, 2018b). The

disassembling process allowed the indication of valuable insights, similarities, differences and further focus areas throughout the data.

02:12	CEO: I would like to say that, if we would start with the SDGs, we use them, you could say, in connection with the whole Cradle to Cradle process. We don't sit down and take a dice and say: "that is what we do in production". But have had to do a lot of things, and also many things different in the whole corporation. And that has been a very long process that started in 2007, where we said that we were going to start with the low hanging fruit... and look at how we could transform ourselves slowly. We knew that it was not something that we could just do over night. But the first thing was the CO2-neutralization that was important for us at the same time as we were pressuring our suppliers as well in the process. We are a small corporation with 50 employees – so how much can we do? And when we sat down and said "what can we do?" - then we realized that when you look at some of those... what to say, the bigger corporations as Shell, Lego and some of them... and how they actually where pushed by smaller organizations, maybe.... the average man who voted with their feet and did not buy their products and did boycott them. So we sat down and said - "what can we do as a small corporation?" And what we did was that we took our suppliers and put them in front of us – or the ones that we had at that time and said "we wish to act in the future with some corporations that thinks just like us. We want to become CO2-netural and you shall help us with that. The products that we take in in our corporation. You should be able to document the CO2-footprint of them".

Figure 8: Example of a Coded Interview Passage (Appendix 5; 11)

Thirdly, the coded data was reassembled during a workshop, which included that all interviews were printed and cut into phrases distinguished by its colour codes (Castleberry & Nolen, 2018b). As a process of alignment between the researchers, such coloured quotes were discussed individually and then clustered by the codes on a wallpaper (Appendix 11). During this process, some coded unites were changed or excluded to align on its quality of the coded texts. Within such coloured codes, this procedure led to the development of clustered themes (Appendix 11) (Castleberry & Nolen, 2018). These themes were brought into context, which created higher-order codes, meaning a hierarchical order of the codes that enables a multi-level analysis (Castleberry & Nolen, 2018). This entire reassembling process allowed for greater themes to be identified, which created valuable connections between the interviews.

Fourthly, this process started data interpretations and analytical alignments between the themes, which Castleberry and Nolen (2018) define as interpreting stage. The analytical conclusions sat the basis for an analytical skeleton used during the analysis, as clusters of key insights were created as a point of departure (Appendix 11). This skeleton will be described below as well as in Table 4 in the beginning of the analysis.

The fifth and last step of the thematical coding process derived from the interpretation stage of identified themes into the next stage of concluding. Such conclusions are answering the research questions and addressing the research area.

6.2.1.3 Resulting Analysis Outline

As previously argued, the data analysis resulted in the greater themes to be identified. The main themes identified where three phases where different strategies were present in KLS PurePrint. These were named Phase 1, Phase 2 and Phase 3. Thereafter, they were utilized as the foundation for the analysis-skeleton shown in Table 4, which allowed the rest of the analysis following a chronological structure. The findings in the data could thereafter be placed out on this timeline where the three different sub-questions where placed under one of the three phases (Appendix 11).

6.2.2 Quality Criteria

Quality criteria have been utilized in order to support the research design. Yin (2003) has outlined tests to help researchers to review the quality of empirical social research such as case studies. The chosen tests for the specific case study of KLS PurePrint are *construct validity*, *external validity* and *reliability* (Yin, 2003). These quality criteria have been applied throughout the entire research process in order to achieve the highest possible quality.

Construct Validity

Construct validity is concerning "establishing correct operational measures for the concepts being studied" (Yin, 2003, p. 34). This quality criterion is of importance in order to make sure that the assessment regarding the strategic change process in KLS PurePrint has been done with an adequate operational set of measures, meaning that the data was aimed at being collected with an objective mind. In order to achieve this, interviews were conducted during data collection with multiple employees in order to generate "multiple sources of evidence" (Yin, 2003, p. 36). A timeline (Table 1) has been outlined after data collection in order to create a "chain of evidence" (Yin, 2003, p. 36), where the chronological order of events in KLS PurePrint has been described. At last, the CCO was asked for a follow-up interview and smaller questions via an email, to assure that some events and facts where validated. This can be argued to be a way of key informants to review the data during the case process (Yin, 2003).

External Validity

External validity is regarding the importance to establish "the domain to which a study's findings can be generalized" (Yin, 2003, p. 37). Knowledge that is generated from case studies is often being

criticized of realists that believe certain type of knowledge is not generalizable since it is assembled by only one particular case study (Flyvbjerg, 2004; Yin, 2003). However, Yin (2003) argues that case studies depend on analytical generalization, where the researchers shall aim for generalizing a specific part of the results to broader theory. In order find out if another context is applicable for generalizing the findings, the researcher needs to utilize replication logic (Eisenhardt, 1989; Yin, 2003). Replication logic implies that the researcher uses the initial theory and investigates if the findings can be replicated in other contexts. This underlines the importance for researchers to create a research design that is supported by theory to be able to use the replication logic and this is why the theoretical framework was outlined before gathering data (Yin, 2003).

Reliability

The quality criterion of reliability is concerned with "demonstrating that the operations of a study – such as the data collection procedures – can be repeated, with the same results" (Yin, 2003, p. 34). This criterion is developed in order to decrease errors and biases within the research process. This implies that if another researcher would conduct the same research process as this case study, he or she shall "arrive to the same findings and conclusion" (Yin, 2003, p. 37). This highlights the importance of documenting the case study process and to be transparent in order to enable other researches to follow them. Madill, Jordan and Shirley (2003) describe reliability within qualitative studies as "consistency of meaning" (p. 17) and put weight on the importance of being consistent when interpreting the gathered data. Both Yin's (2003) and Madill et al.'s (2003) views have been aimed for previously, where the process of choosing interviewees and data analysis have been outlined, which can be compared to what Yin (2003) define as a case study protocol.

6.3 Philosophy of Science and Foundations

This case study takes a social constructivist approach, in order to answer the research question. The objective within social constructivism is to investigate the way that thoughts, ways of talking and given life situations have been constructed and reconstructed (Egholm, 2014; Guba & Lincoln, 1994). Social constructivism does not see the individual human as the central actor to study but rather as the representative for a bigger collective, which is constantly being defined by social construction and discussions (Egholm, 2014). Therefore, the individual human's experiences and intentions are not of

interest, as they are not self-representative and do not have an essence by themselves. Rather, the experiences and intentions are seen as results of the overall social construction, which the individual cannot determine herself (Egholm, 2014; Smircich & Morgan, 1980).

Ontology

Ontology is described as the study of being and describes the basic assumptions how to views the studied phenomenon in the world (Crotty, 1998; Egholm, 2014). Within social constructivism, the ontological assumption is relativist, which implies that the reality is created locally and dependent of the specific context (Guba & Lincoln, 1994). Thereby, the phenomenon does not have an essence by themselves, but is rather being constructed in a specific context (Egholm, 2014). This ontological assumption describes the reality as a social construction and highlights that "the social world is a continuous process" (Smircich & Morgan, 1980, p. 494), and is a result of the everyday life as individuals project themselves on their world to create meaning of it, which aligns with Hernes et al.'s (2015) view on ongoing change processes. This implies that the same phenomenon can be described differently depending on when, where and by whom (Egholm, 2014). Thereby, a phenomenon can only be studied via the meaning that the one who studies it ascribes it, which generates attention to how conditions and assumptions are being created and appear to humans. This is the reason for that the theoretical framework was outlined beforehand, since it increased the possibility to create analytical generalizability around the gathered data and not via the personal opinion of us as researchers.

Through this view, language and labels become of importance, as they are a symbolic way of how humans can communicate the way that a phenomenon is being constructed (Egholm, 2014; Smircich & Morgan, 1980). This implies that cultural and historical events play a role in the meaning making of a phenomenon and that knowledge can be seen as contingent and temporary (Hernes et al., 2015), which means that the process of creating the knowledge constructions is of interest rather than the actual construction (Egholm, 2014). Further, it indicates that multiple shared realities might co-exist but that these are limited to the moment where they are created and sustained (Smircich & Morgan, 1980). Thereby, it is of interest to investigate how different individuals in KLS PurePrint interpreted the strategic change process towards circularity.

Epistemology

The epistemological assumption within philosophy of science creates the grounding for how to decide what knowledge is attainable and can therefore be described as "the nature of knowledge" (Crotty, 1998, p. 8). The epistemological assumption within social constructivism is subjective, which denotes that meaning is created by the subject who projects it onto the object (Crotty, 1998; Egholm, 2014). This implies that the object itself is not a part of the creating of knowledge and meaning (Crotty, 1998). The subjective meaning can be related to the quality criterion of external validity, where analytical generalizability has been aimed for by creating the theoretical framework. Thereby, the subjective meaning of us as researchers was strived to be minimized.

Within subjectivism, individuals ascribe meaning to objects (Crotty, 1998), which means that knowledge is influenced by time and place and that it is continuously changing, depending on the context (Egholm, 2014). The view of knowledge as an ongoing process is also emphasized by Hernes et al. (2015). This creates a focus for understanding how reality and knowledge is created in KLS PurePrint around the strategic change process towards circularity and therefore opens up for the possibility to investigate how the reality has been viewed differently at different time periods.

6.4 Limitations of the Case Study

The case study at hand has, as any other case study, its limitations. Firstly, the contact with the CCO, who has been argued to be both the entry point and gatekeeper, can be seen as a limitation. This is due to the fact, that the CCO can have influenced the research path of the case study in regards of whom he suggested as interviewees. In order to minimize this limitation, an initial plan of different hierarchical positions within KLS PurePrint that could be valuable to interview was outlined.

Secondly, limitations have also existed during the data collection. For example, the interview with the Production Employee was conducted in the production area surrounded by machines and the one with the Sales Manager was conducted in an open working space, where other colleagues were working. Both occasions were due to the wishes of the interviewees. These external factors could have affected the data collection. However, the interviews were conducted in their own setting, where employees felt comfortable and the data from these interviews have been coherent with the other data.

Thirdly, a limitation of this case study is the time perspective in two aspects. On the one hand, this case study is a short-term study and not a longitudinal one, because of the pre-set conditions of the Master Thesis. This creates the limitation of not being able to follow the interviewees of KLS PurePrint during a longer time period, where different nuances of their understanding of the strategic change process towards circularity could have appeared. On the other hand, as mentioned, the interview guides where developed in order to cover the change process from 2007 until today. This enhances the possibility of covering a longer time span where the interviewees had the possibility to elaborate on past events. However, this also implies the risk of the interviewees making sense of the past in a more positive manner than they would have if they were in the middle of the strategic change process. This is based on the retrospective nature of making sense, which implies the human's need to create justification of past events (Hernes et al. 2015). Thereby, the description of the past in the interviews could have been affected by the research approach.

7. Analysis

The following analysis will be outlined to explore the sensemaking during a strategic change process towards circularity in KLS PurePrint. This will be performed by following the chronological structure of the years of when new strategies where implemented, divided into Phase 1, Phase 2 and Phase 3. This will allow the analysis to follow in a time wise structure and portray the details of the change process that KLS PurePrint went through from before 2007 until 2019. It will further illustrate how KLS PurePrint has transformed from having a traditional strategy to a transitional arriving at a transformational one.

Each strategic change phase will include an analysis of how KLS PurePrint's management viewed sustainability, how strategies where developed based on the management's view of sustainability and how the management utilized dynamic capabilities in order to develop these strategies. This will be performed by utilizing Borland et al.'s (2016) theory on strategic management and ecological sustainability.

Moreover, each phase and its change process will be explored in depth by identifying key actors and actions that helped the utilization of sensemaking throughout KLS PurePrint. This will be done by applying Hernes et al.'s (2015) theory on change processes and sensemaking. According to Hernes et al. (2015), sensemaking results from the sequence of individual's patterns that evolved into binding behavioural commitment, thereby continuously creating a narrative of the company's actions. Thereby, the sensemaking cannot be seen situational, but rather floating, as it has no start nor ending. Therefore, the analysis will follow the same outlined activities through a whole phase.

As a result, the three strategic change phases are divided into the three theoretical subparts parts of world view, strategy/dynamic capabilities and sensemaking. Each strategic phase will be ended with the integration of the three sub-questions within a conclusion. Hence, the outline of the analysis will follow as illustrated in Table 4 on next page.

	Theoretical Area	PHASE 1	PHASE 2	PHASE 3
Sub - question 1	World View	Anthropocentric	Anthropocentric moving towards Ecocentric	Ecocentric
Sub - question 2	Strategy *5R's*	Traditional /	Transitional • Reducing	Transformational • Rethink • Reinvent • Redesign • Redirect • Recover
	Dynamic Capabilities	• Sensing	• Seizing	• Maintaining • Remapping • Reaping • Second Maintaining through the SDGs
Sub - question 3	Sensemaking	Interacts & Patterns of Interacts Commitment Narrative	Interacts & Patterns of Interacts Commitment Narrative	Interacts & Patterns of Interacts Commitment Narrative
		Phase 1 Conclusion	Phase 2 Conclusion	Phase 3 Conclusion

Table 4: Outline of Analysis

7.1 Phase 1 - Before 2007

In this part of the analysis, the world view of the managers in KLS PurePrint, the resulting strategy and the utilized dynamic capabilities will be explored. Afterwards, the sensemaking of this phase will be analysed. This corresponds to Phase 1 in Table 4.

7.1.1 World View

In the following, the world view of KLS PurePrint's management in Phase 1 will be explored to create an understanding for how they viewed sustainability at this point in time. This will be achieved by applying Borland et al. (2016).

In the years before 2007, KLS PurePrint was one of the 10 biggest print houses in Denmark, but the one performing the poorest (Appendix 1). They were under great financial pressure and struggled to stay profitable in a digitalizing world where classical printed products were not requested by customers at the same level as before (Appendix 6). Therefore, the changing market situation demanded KLS PurePrint to find a way to survive financially (Appendix 1). At this point in time, investments in new facilities and new machines were made to progress and to stay financially sustainable (Appendix 1). Thereby, the management of KLS PurePrint, saw nature as something that generates opportunities in order for them to develop and make progression, and is highlighted by Borland et al. (2016) as the anthropocentric world view.

Further, Borland et al. (2016) argue how the anthropocentric world view sees land that is not being utilized as a misuse of opportunities. Due to the management's view on sustainability, KLS PurePrint took these opportunities to grow when moving from Søborg to Glostrup and then finally to their current facilities in Hvidovre (Appendix 1, KLS PurePrint 1, n.d.). Moreover, in Phase 1, KLS PurePrint's production process included environmentally harmful chemicals, which were questioned in the company (Appendix 5). This implies how KLS PurePrint in the years before 2007 did not feel responsible for how they affected nature based on their production processes and products. These are also characteristics of the anthropocentric world view (Borland et al., 2016). KLS PurePrint did not examine their utilization of non-renewable natural resources, due to the fact that they had no resource strategy (Appendix 1; 6). KLS PurePrint therefore contributed to natural resource exploitation that is emphasized by Borland et al. (2016). This implies how the management of KLS PurePrint saw themselves as hierarchically above other species on the planet, where sustainable development focuses on human development by becoming financially sustainable (Borland et al., 2016).

The CCO of KLS PurePrint described that he believed that it is common for companies to operate by doing "business as usual" (Appendix 1, p. 21), which is argued above to be following the anthropocentric view on sustainability (Borland et al., 2016). Further, the statement can exemplify how Borland et al. (2016) argue that the anthropocentric view on sustainability is a common way for how companies in the Western world run their businesses. They therefore define it as a social dominant paradigm, or as Geels (2002) would call it, a regime. This implies that KLS PurePrint could be defined as a traditional printer house, as they were following the anthropocentric view on sustainability Phase 1.

7.1.2 Strategy

In the following, it will be investigated how the CO2-strategy in Phase 1 was developed based on the management's world view. This will be achieved by applying Borland et al. (2016).

As expressed in the Case Description 2.1, KLS PurePrint lacked a clear strategic direction and a shared vision before the year of 2007. The CCO emphasized how the organizational structure in KLS PurePrint before 2007 consisted of a family ownership structure with only family members as shareholders (Appendix 1; 9). The CCO emphasize how this type of organizational structure lead to "poor management, lack of focus, too many internal discussions with strategy" (Appendix 1, p. 3), which resulted in the financial situation that was present in the years before 2007. Before 2007, strategy was seen in terms of "opportunities" (Appendix 6, p. 11), where KLS PurePrint for example invested in new machines, which provided them with new production possibilities (Appendix 1; 6).

It was not until the CCO joined in 2001, at that time as a CFO, that a greater business mind got integrated into the management of KLS PurePrint (Appendix 6). The CEO mentioned that the decision of promoting the CFO to become the CCO in 2006 generated that KLS PurePrint became "a professional company" (Appendix 5, p. 6). This professionalization also included the election of the first external Board Member, who became the Chairman in 2006 (Appendix 6). Short time after, the external Board Member 1 was additionally brought in (Appendix 1; 6). The Chairman indicated himself as an important actor in the following professionalization process of KLS PurePrint: "based on my knowledge for strategy, based on my key competencies that is doing concepts" (Appendix 6, p. 3). The Chairman believed in working with concepts that establish a foundation for a strategic direction and thereby further investments: "[…] we have a concept; we need this machine. And we have these customers and they're willing to buy and then we make the investment" (Appendix 6, p. 11). This further entails how the Chairman had a more professionalized approach.

The strategy of KLS PurePrint at this point in time can be defined as a traditional strategy (Borland et al., 2016). This is a result of how KLS PurePrint utilized a conventional strategy. Borland et al. (2016) argue that a traditional strategy defines companies as their own entity that does not affect the environment, which further follow Figure 2 of input-output without the environment (Pearce & Turner, 1990). Therefore, KLS PurePrint did not embrace ecological sustainability through their traditional strategy at that time. This is a fact as they did not include the environment in terms of environmental commodities and waste discharge to the environment (Pearce & Turner, 1990). KLS

PurePrint's traditional strategic approach can be interpreted as a linear process, where the product follows a cradle-to-grave system (Borland et al., 2016; Pearce & Turner, 1990). In this linear process, the waste resulting from both the product itself and its production process can end up as pollution in nature as some components are not biodegradable (Borland et al., 2016; Pearce & Turner, 1990). This can be exemplified by the toxics included in the ink that KLS PurePrint used during that time period (Appendix 5).

Thereby, the management of KLS PurePrint's anthropocentric world view in the years before 2007 led to a traditional strategy. This type of strategy assumes that the company and nature operate in separate systems where they do not interact, which describes KLS PurePrint's product processes as a linear system (Borland et al., 2016). As mentioned in the Literature Positioning 3.1, Pearce & Turner (1990) also highlight this type of economic process. They describe them as a linear economics where nature is ignored, which creates an issue regarding the waste that companies and their consumers generate.

7.1.2.1 Dynamic Capabilities

In the following it will be investigated how the management of KLS PurePrint utilized the dynamic capability of sensing in order to achieve the CO2-strategy. This will be performed by utilizing Borland et al. (2016).

Sensing

The inclusion of external actors laid the foundation for a "professional external board for the first time" (Appendix 1, p. 3). Teece (2007) highlights how "investments in research activity" (p. 1322) is necessary in order to be able to utilize the dynamic capability of sensing. This type of investment can be seen by the inclusion of the external actors as Board Member 1 and the Chairman in the Board of Directors (Appendix 1; 6). This enabled the management of KLS PurePrint both to see the financial threat towards their business, due to other competitors, and the larger one towards the entire print industry. Further, the management of KLS PurePrint sensed the opportunity of including external knowledge into the Board of Directors and managed to shape new a foundation for the management of KLS PurePrint. Both the sensing and shaping activities helped the management of KLS PurePrint to handle the threats that were present in the competitive arena, where they had to take action in order

to survive. Thereby, the dynamic capability that was dominant during the years before 2007 was sensing.

7.1.3 Sensemaking

The analysis of sensemaking, following Hernes et al.'s (2015), will be achieved through exploring the element of interacts and the resulting patterns of interacts. Afterwards, the evolved commitment and the created narrative will be described. Throughout these three elements, the exploration of sensemaking will follow the same activities and it will be subsumed within the Phase 1 Conclusion, in 7.1.4.

7.1.3.1 Interacts and Patterns of Interacts

Interacts and the following resulting patterns of interacts will be explored by investigating the drivers of change within Phase 1. The two main drives that created actions between the employees of KLS PurePrint, were the strategy and the family ownership structure during the time leading to 2007.

Strategy Phase 1

As previously described in the Strategy 7.1.2, the strategy within KLS PurePrint in Phase 1 was mainly opportunity driven via investments in new machines and facilities (Appendix 1; 6). The timeline outlined in the Case Description 2. reveals the same result as it highlights the investments of five new machines and technologies while relocating the production facilities four times as key events during the first years 60 years (Table 1). The investments themselves display the dimension one of contingencies of change, as they are creating the baseline for the next actions to be taken (Hernes et al., 2015). As investments bind resources, they also bind interacts with the investments for the time being used, which resulted in the creation of patterns. Further, this reoccurrence of investments based upon the same strategy additionally followed the dimension of temporalities of change, as such decisions are always made towards the future (Hernes et al., 2015).

Another example that follows the same dimensions is the introduction of standards into KLS PurePrint from 1995 onwards (KLS PurePrint 1, n.d.). Firstly, the ISO 9001 was implemented as a quality standard and secondly the Nordic Swan Eco label followed as an environmental standard (KLS PurePrint 1, n.d.). This implementation started the creation of interacts around the standards, which resulted in patterns of interacts created by the employees being introduced to them in their daily work (Appendix 1). Both the ISO 9001 as well as the Nordic Swan Eco label represent standards

that require compliance as well as financial commitment. Therefore, they indicate explicit and irrevocable acts, mentioned by Weick 1995 (mentioned in Hernes et al., 2015). These investments represent a statement made by the management of KLS PurePrint, which cannot be undone. Furthermore, the investment in standards represents the dimension of contingency of change, as it will further affect future investments to be made by the management. Moreover, this indicates habitual behaviour of the management as it bind resources to create opportunities (Hernes et al., 2015).

Family Ownership Structure

The fact that the company was founded in 1946 by Preben Larsen and his father and later was taken over by his three children in 1982 indicates a connection to the Larsen family. In 2006, the CCO joined KLS PurePrint as the fourth generation (Appendix 1). The act of family members taking over management positions follows the coherence of actions of continuing as a family owned company. This highlights the dimensions of temporality described by Hernes et al. (2015), as the act of employing family members brings previous generations into the sensemaking of the following years. Further, the Chairman, CEO and CCO emphasized, that the strategic process before 2007 was unstructured and unprofessional (Appendix 1; 2; 6). More specifically, the CEO described it as: "[…] to run a family-owned company with a family-board makes that you don't always make the right decisions. […] We were good at making decisions but not the right ones" (Appendix 5, p. 6). The CCO also described the phase as: "For all the things we actually had done so far, there was really no real strategy. Buying a machine is not a strategy" (Appendix 1, p. 20). Both quotes from the employed family members within the management of the KLS PurePrint imply criticism towards Phase 1. The criticism also emphasis a retrospective view, where the patterns of interacts changed to become professional through integrating an external board. Hereby, patterns of interact arose around the strategy in Phase 1 as well as the family ownership structure.

7.1.3.2 Commitment

The following part of the analysis mirror the same drivers that have been described above in the section of interacts and patterns of interacts. This will be completed by applying Hernes et al. (2015).

Strategy Phase 1

The opportunity driven strategy during Phase 1 created interpretive commitment within KLS PurePrint. This is argued based on how the management committed monetary resources to new machines, as well as to education for employees learn how use them (Appendix 1). This signals how the patterns of interacts within KLS PurePrint in Phase 1 were created around the expectations on employees to adapt to the new purchased machines and facilities as the key strategy. Accordingly to Hernes et al.'s (2015) dimension of heterogeneity of factors, it can be argued that the resulting commitment evolved around these investments by binding resources to new non-human actors that created progression.

Family Ownership Structure

Commitment evolved further by the ownership structure consisting of the family Larsen. Even though the management of KLS PurePrint changed, it was always based on members of the Larsen family (Appendix 1; 5). This created an impression of coherence throughout KLS PurePrint, as positions were continuously filled by the next generation of family members. Thereby, the promotion of the CCO led to the creation of social commitment, as he is a family member. Hernes et al. (2015) mention that social commitment is of great importance leading to sensemaking of actions and meaning within social contexts. This was shown in KLS PurePrint as it drove the understanding of the strategic investments that took place in Phase 1. Thereby, his initiative to include external Board Members and thereby moving towards becoming professionalized was not questioned by the employees of KLS PurePrint. This is an example of how interpretive and social commitment became interwoven within the management of KLS PurePrint. Hernes et al. (2015) describe this as a process a difficult to disentangle and as leading to the creation of an internal narrative. This will be analysed in the following part of Narrative 7.1.3.3.

7.1.3.3 Narrative

In the following, the narrative of Phase will be analysed via the key drivers of strategy and the family ownership structure. This will be accomplished by utilizing Hernes et al. (2015).

Strategy Phase 1

The narrative of KLS PurePrint in Phase 1 evolved from the previously explored steps of the sensemaking processes, namely interacts, patterns of interacts and commitment. Thereby, the narrative followed the same path of new investments and new family members joining the management of KLS PurePrint. This emphasizes how the narrative was mainly driven by the coherence and temporality throughout the years, mentioned by Hernes et al. (2015). Therefore, the narrative highlighted an opportunity-driven strategy, which was mentioned by the CCO and CEO (Appendix 1; 5). Based on the dynamic capability of seizing, new opportunities were approached by repeating investments in machines and facilities. This follows the process of "constructing new narratives that tie together interpretations of the past, present and future" (Kaplan & Orlikowski, 2014, p. 25).

Family Ownership Structure

The past narrative and the strong bond to the history that was referring to the previous generations of the Larsen's, was emphasised during the visits at KLS PurePrint. This is exemplified by how the CCO pointed to the wall, while speaking about the strategies, during both the initial meeting and the first interview. The mentioned wall is covered in a wallpaper picturing Knud Larsen together with his child, the CCO's grandfather, walking together on the beach (Figure 9).

Figure 9: Wallpaper in Meeting Room at KLS PurePrint

The CCO say explained that he is “the fourth generation in the company” (Appendix 1, p. 1), while being asked about if he can elaborate on his position in KLS PurePrint. Thereby, it entails how he connects his role in KLS PurePrint to him working for his family's company.

7.1.4 Phase 1 Conclusion

The following conclusion answers the three sub-questions according to Phase 1.

Firstly, part 7.1.1 of the analysis showed that the management of KLS PurePrint had an anthropocentric worldview before 2007. This is argued as their strategic approach in this phase was focused around investments in new print machines and new facilities. This emphasizes that KLS PurePrint saw nature as a resource to make progress. Furthermore, during this time, KLS PurePrint had chemicals in their product, which implied that they did not feel a responsibility for how their company affected the nature around it.

Secondly, part 7.1.2 of the analysis showed how the anthropocentric world view resulted in KLS PurePrint having a traditional strategy during this time. This is argued due to that the strategy before 2007 emphasized a linear process as cradle-to-grave. This process contained toxics and resulted in waste material that was not taken into account in KLS PurePrint’s product process. Furthermore, this part of the analysis showed how the dynamic capability that was utilized in Phase 1 was sensing. This was shown by the investments made in a new Board of Directors, including external members. This investment enabled KLS PurePrint to include external knowledge and skills into their company, which allowed them to sense opportunities and handled threats by deciding to approach sustainability.

Thirdly, part 7.1.3 of the analysis showed that sensemaking during these years was mainly driven by two aspects. The past of KLS PurePrint influenced the management to base their strategic focus around opportunistic machine and facility investments. Those acts mainly created their narrative, which required changes in patterns of interacts by the involved employees. Further the sensemaking was connected to the family ownership structure of the company to the Larsen family. Over the years, the changes in family members, especially the new CCO in 2006, indicated family’s commitment to the company that created the sensemaking around the strategies.

7.2 Phase 2 - 2007 and Onwards

In this part of the analysis, the world view of the managers in KLS PurePrint, the resulting strategy and the utilized dynamic capabilities will be explored. Afterwards, the sensemaking of this phase will be outlined. This corresponds to Phase 2, which is illustrated in Table 4.

7.2.1 World View

In the following, the world view of KLS PurePrint's management in Phase 2 will be examined, which will create an insight in how they viewed sustainability. This will be achieved by applying Borland et al. (2016).

A company does not have to position itself at one of the extreme ends of the scale of having either an anthropocentric perspective or an ecocentric one (Borland et al., 2016). This is exemplified by the process that KLS PurePrint went through from 2007 until 2013, when they initiated the strategic change. During this time KLS PurePrint started to move away from the anthropocentric world view but still did not fully embrace the ecocentric one.

The creation of the CO2-reduction strategy was the moment when KLS PurePrint started to move towards the ecocentric world view. This is shown through the centralized role of humans being replaced by emphasizing the role of the nature's ecosystem via the CO2-strategy instead (Borland et al., 2016). But since the CO2-strategy does not fully emphasize an alignment between human's operations and the nature's ecosystems, but rather a reducing affect only, it cannot be argued that KLS PurePrint at this given time was being fully ecocentric. Therefore, examples of how KLS PurePrint acknowledged both world views during the years between 2007 and 2013 will be outlined in the following.

Through the CO2-strategy, the management of KLS PurePrint began to acknowledge the problem of climate change by implementing different initiatives. Firstly, KLS PurePrint changed their strategic primary focus in 2007 by creating the new vision of becoming "the greenest print house in Scandinavia" (Appendix 1, p. 3). This is an example of how the strategic primary focus moved from being purely profit focused to trying to reach profitability via sustainability, which is a characteristic of the ecocentric perspective (Borland et al., 2016). Secondly, as mentioned in the Case Description 2.2, KLS PurePrint invested in a CO2-reducing white roof in 2012 (Appendix 1). This is an example of how the management of KLS PurePrint recognized how ecosystems create an important value and

wanted protect earth by mitigating climate change. Thereby, this initiative highlights how the management started to believe, that KLS PurePrint needed to take responsibility for their actions and how they affected the constraints of nature. These activities can therefore be argued to be examples of how KLS PurePrint started to move further towards an ecocentric perspective (Borland et al., 2016).

However, as argued, the full change towards a company system that is aligned with the ecosystems, thus emphasizing the ecocentric perspective, was not fully present in Phase 2 (Borland et al., 2016). This is due to how KLS PurePrint was only trying to limit their effect on the ecosystems, by reducing the emission of CO2, and not completely align their production processes with the ecosystems. This implies that the management of KLS PurePrint did still see themselves as dominant to other species on the planet and was not fully including ecological sustainability in their view on sustainability. Thus, the management of KLS PurePrint still had strains of an anthropocentric world view in their perception of sustainability, which highlights a paradigm (Borland et al., 2016).

7.2.2 Strategy

In the following, it will be explored how the strategy in Phase 2 was established based on KLS PurePrint management's view on sustainability. Furthermore, it will be investigated how the management utilized the transitional R of reducing to perform the CO2-strategy. In order to achieve this, Borland et al. (2016) will be utilized.

In 2007, the creation of a Board of Directors that consisted of both internal and external actors took place (Appendix 1; 6). As mentioned in Case Description 2.2, an initial activity to embrace the professionalization was when the management team went on a strategy weekend. The objective with the weekend was to create a vision and strategy to implement throughout the company (Appendix 1; 2; 4; 6). The outcome from the strategy weekend was the vision of becoming "the greenest print house of Scandinavia" (Appendix 1, p. 3). Hereafter, the CO2-strategy evolved to make that vision become reality (Appendix 1). The CO2-strategy is an example of what Borland et al. (2016) define as a transitional strategy as goal of the strategy was to decrease the CO2-emission from their operations. This is a reductionist approach that is not fully embracing a circular system where the company is aligned with the ecosystems of nature (Borland et al., 2016; Braungart et al., 2007). Therefore, the transitional CO2-reducing strategy still emphasised a linear system but with the belief that the eco-efficiency should be aimed for (Braungart et al., 2007).

7.2.2.1 Transitional 5Rs

The objective of decreasing KLS PurePrint's CO2-emission is emphasising one of the five transitional add-on options, reducing, mentioned by Borland et al. (2016). KLS PurePrint made this add-on option possible due to their supplier impact mapping that was created in 2008 (Appendix 1; 4). It further made it possible for KLS PurePrint to present an eco-efficient option to their customers, which helped them to lower their own CO2-emission. However, Braungart et al. (2007) would only refer to this option as "less bad" (p. 1338). Borland et al. (2016) agree, as they highlight that reducing is a reductionist approach does not radically change how KLS PurePrint carried out their processes. This is rooted in the attempt to exclusively reduce the harm that their production made on nature's ecosystem through the CO2-strategy.

Companies that operate with transitional strategies are still not paying full attention to how their business processes affect the environment (Borland et al., 2016). As a result, the products and product processes at KLS PurePrint still consisted of materials that were harmful to the environment, as for example toxic chemicals (Appendix 1). These eco-efficient strategies do "not address the need for fundamental redesign of industrial material flows" but are rather "a strategy for damage management and guilt reduction" (Braungart et al., 2007, p. 1340). The reason for this is that the transformational R of reduction focuses on reducing the amount of material, as for example carbon, spent in a production process (Borland et al., 2016). The Production Employee of KLS PurePrint also emphasized the lack of redesign of material flows, as he pointed out that when the CO2-reduction strategy was implemented, the only change was the material they used, but the production process was the same (Appendix 4).

Hart and Dowell (2011, mentioned in Borland et al., 2016) argue that transitional strategies might not be adequate for companies in the long run. This is a result of the increased demands on companies in society and how reducing a company's negative impact on the environment is therefore not enough. Hart and Dowell (2011) call out for the need for "breakthrough strategies that actually resolve social and environmental problems" (cited in Borland et al., 2016, p. 299). This calls for the next type of sustainability strategy that is outlined by Borland et al. (2016), namely the transformational strategies that will be analysed in 7.3.2.1.

The remaining transitional R's mentioned by Borland et al. (2016) are reuse, repair, recycle and regulate. These actions were not found in the gathered data within Phase 2 and are therefore not analysed.

7.2.2.2 Dynamic Capabilities

In the next paragraph, it will be outlined how the management utilized the dynamic capability of seizing in order to develop the CO2-strategy. This will be performed by applying Borland et al. (2016).

Seizing

Borland et al. (2016) highlight the importance of a company to be able to seize opportunities in order to compete with other companies they are surrounded by. As described before in the Analysis 7.1, KLS PurePrint was under great financial pressure and needed to take action in order to survive at this time (Appendix 1; 6). The management team of KLS PurePrint therefore used their dynamic capability of seizing, when they decided to create an overview of the market before the strategy weekend in 2007: "we had looked into the market, and then saw that there was a hole about the […] environmental agenda" (Appendix 1, p. 2). The market overview that the management of KLS PurePrint had created can be exemplified as an action to seize opportunities (Borland et al., 2016). This is argued as they were trying to find a location on the competitive market that gave them a unique capability to act further with.

After creating an overview of their competitors at the Danish print market, the management took time and discussed different approaches for KLS PurePrint to survive: "I think we were 10, 11, 12 people at that strategy weekend, discussing all kinds of different strategies during Saturday and most of the night. And then on Sunday we decided on sustainability" (Appendix 1, p. 3). This highlights how seizing the opportunity to approach sustainability demanded the management to get together and brainstorm "[...] new creative and innovative processes, products structures, and systems" (Borland et al., 2016, p. 304).

Furthermore, Borland et al. (2016) emphasize how the dynamic capability of seizing might require companies to either collaborate with other companies or invest in technology. Both can be seen in KLS PurePrint, as the management invested in electrical cars in 2010 in order to decrease their CO2-emission, which was the competitive advantage that they seized through sustainability (Appendix 1). Later on, the collaboration characteristic of seizing can be seen as when the management of KLS PurePrint started to have a dialogue with their suppliers in order to assure that both were striving towards the same vision. In Phase 2 this was sometimes difficult: "They did really not understand what this was about" (Appendix 5, p. 2). As a result, KLS PurePrint decided to change its paper

supplier. Hereafter, KLS PurePrint put emphasis on their vision when looking for new suppliers. The CEO highlighted this:

> "Again, it is the question about why we do things. We do it because if we want to make a difference [...]. They do not have to be fully there but at least have thought about it! On their way! And then you had those who didn't care at all. We don't want to play with them! They sail in their own lake and drown in their own shit!" (Appendix 5, p. 15)

The decision to approach a sustainability strategy through the CO2-reduction implies how KLS PurePrint captured a competitive advantage, due to the lack of other print houses in Denmark doing the same. But, according to Teece (2007), a competitive advantage is only temporary, as the competitive arena of businesses is fast-paced. Therefore, this competitive advantage needed to be properly cultivated in order to turn into a sustainable advantage, meaning that is "difficult-to-replicate" (Teece, 2007, p. 1319). Thereby, it is important that competitive advantages are constantly being updated and protected in order to stay unique in the future. This can be seen as a reason for KLS PurePrint to enter Phase 3 and approaching a transformational strategy by moving from the CO2-strategy to the cradle-to-cradle strategy. This will be further analysed in 7.3.

7.2.3 Sensemaking

The analysis of sensemaking, following Hernes et al.'s (2015), will be achieved through exploring the interacts and resulting patterns throughout the years of the CO2-strategy. Afterwards, the commitment that evolved from the new patterns will be evaluated and finally the new narrative of KLS PurePrint will be examined. By exploring these three elements, the sensemaking of Phase 2 will be subsumed in the Conclusion Phase 2 in 7.2.4. However, the results from Phase 1 cannot be neglected, as sensemaking represents the ongoing flow resulting from the past (Hernes et al., 2015).

7.2.3.1 Interacts and Patterns of Interacts

Interacts and the resulting patterns of interacts will be investigated by exploring the drivers within the transformation of Phase 2. The main drivers that created interacts between the employees of KLS PurePrint were the strategy and supplier impact mapping. In the following, those drivers will be analysed via Hernes et al. (2015).

Strategy Phase 2

As mentioned previously in 7.1.2, KLS PurePrint had initiated a professionalization driven by the new CCO through the integration of Board Member 1 and the Chairman. The CO2-strategy was created to minimize product CO2-emissions by 20 % within KLS PurePrint's operations, with the goal of becoming carbon neutral in 2010 (Appendix 1). The CO2-strategy and its related vision represent verbal interacts since they bond the employees together internally. This resulted in related patterns of interacts following Hernes et al. (2015). These verbal acts further represent the dimension of forces at work, as they activated and drove the change process within KLS PurePrint (Hernes et al., 2015).

The new corporate vision of becoming "the greenest print house in Scandinavia" (Appendix 1, p. 3) was presented during an employee meeting to align all the employees and make them familiar with the new strategy (Appendix 1; 6). During the event, the sustainability message of the new strategy was supported through serving green cakes. This act of a green-coloured cakes indicated the change of the management's patterns of interacts highlighted by Hernes et al. (2015). Both the event and the coloured cakes were non-human actors that also allowed for and activation of the change towards sustainability. Hence, this indicated the dimensions of heterogeneity of factors as well as the forces at work, as different non-human and human actors created momentum together towards the future (Hernes et al., 2015). As a result, the institutional factor of an employee meeting created actions and interpretations around the new implementation of the CO2-strategy, while creating sustainable associations with the colour green.

By the employee event acting as verbal interacts, the CO2-strategy was further implemented by a series of quarterly employee meetings (Appendix 5; 6). This created a new pattern of binding actions as they were repeated to create internal meaning towards the employees (Hernes et al., 2015). Although KLS PurePrint had held annual employee meetings before the change in 2007, both the Chairman and the CEO acknowledge the new series of quarterly meetings after the implementation of the CO2-strategy during the interviews (Appendix 5; 6). This exemplifies an integrated process surrounding the quarterly meetings, indicating to the management and the employees of KLS PurePrint which obligations they have to reach the goal of the CO2-strategy. These obligations created binding interacts for the next quarterly meetings. This implies the fourth dimension of temporalities of change as obligations evolved from past experiences and the actions were directed towards the future (Hernes et al., 2015). This could imply that the other interviewees might not see

the quarterly meetings as something as important after 12 years. However, it does represent what Hernes et al. (2015) mentions as recognizable patterns.

Additionally, different non-verbal acts of investments that were aligned with the CO2-strategy were found in the gathered data. Firstly, the purchase of an electric car and a truck in 2010 was mentioned by many of the interviewees as an important factor that created interacts around the CO2-strategy (Appendix 1; 3; 5). In 2010, the company further joined the Hvidovre Wind Turbine Cooperative, which allowed the company to receive carbon neutral energy (KLS PurePrint 1, n.d.). A further investment was initiated in 2012, as mentioned in the Case Description 2.2, when the company renovated their facility and laid a white roof (Appendix 6). This was done in order to minimize the electricity consumption for cooling down the production machines. Such investments signal the implemented CO2-stratey and lead to a change in binding interacts between heterogenic factors emphasized by Hernes et al. (2015). Therefore, these new investments exemplify the importance of arbitrators that drove KLS PurePrint's change process.

Lastly, the CO2-strategy of KLS PurePrint was acknowledged through receiving various awards. While the Sales Director applied for the Climate Cup award in 2008 without a greater initial motive, the results had a strong impact as KLS PurePrint surprisingly received the award (KLS PurePrint 1, n.d.). In 2012, another acknowledgment followed, as the Municipality of Hvidovre rewarded them with their Environmental Award (KLS PurePrint 1, n.d.). The effects of the media acknowledgment that KLS PurePrint received for their strategic changes within sustainability, created new patterns of interacts as they included a new non-human actor acting as a change arbitrator. The awards further generated commitment, which will be analysed in 7.2.3.2.

Supplier Impact Mapping

In order to implement the newly defined CO2-strategy, KLS PurePrint had to create the process of the supplier impact mapping, mentioned in 7.2.2. This tool was assessing the different CO2-impacts of different paper qualities (Appendix 1). The CCO explains how "having that model made us [KLS Pureprint] stick out from the rest of the industry, by being able to talk to our customers on a completely other level" (Appendix 1, p. 18). The supplier impact mapping can be exemplified as a newly initiated pattern of interacts highlighted by Hernes et al. (2015), as it created a new process of assessing supplier CO2-emissions and paper qualities itself. As a result, both the Department of

Procurement and Sales were influenced in their way of working, by having to act according to such implemented guidelines.

The CCO further emphasized the Sales Department's interacts resulting from the supplier impact mapping: "We had a brochure and we had an annual report. Then we could calculate exactly the CO2-emission from that production and we could guide our customers to reduce carbon emissions by choosing another paper" (Appendix 1, p. 4). This indicates how the brochure, as a non-human actor, was brought into the change process. Further, it exemplifies how the supplier impact mapping engaged the employees via the heterogeneity of factors and how they created change together (Hernes et al., 2015). The brochure verbally framed the patterns of interacts, that the Sales Department used, which allowed customers to calculate their specific product CO2-impact. Hernes et al. (2015) emphasize such patterns as becoming habitual and can be seen throughout how the Sales Department conducted business with their customers in the new way. This was further emphasized by both the Sales Manager and the Sales Director, as they highlighted how they had to learn new arguments in order to interact with customers (Appendix 2; 3).

7.2.3.2 Commitment

The same structure of previously mentioned interacts and patterns of interacts in 7.2.3.1 will be used to analyse the evolving commitment. This will be performed by applying Hernes et al. (2015).

Strategy Phase 2

As the patterns of interacts around the CO2-strategy were analysed in 7.2.3.1, the sensemaking in KLS PurePrint before 2007 was mainly based on the history of a family owned business. However, the CEO emphasized how this often resulted in taking wrong decisions (Appendix 5) and the Chairman referred to it as "chaotic" (Appendix 6, p. 6). This changed with the employment of the CCO in 2006, as he initiated the inclusion of both external board members and acknowledged the need for the CO2-strategy. This resulted in new interacts to evolve around, as such overarching organizational changes had to be understood and accepted throughout KLS PurePrint. The CCO was asked about if he experienced any resistance in KLS PurePrint when initiating the CO2-strategy and answered: "[…] I think so but they accepted it, because we really struggled" (Appendix 1, p. 16). This implies the how the employees were initially critical towards the CO2-strategy but still accepted

it. The previously mentioned green cakes are one example how the management made use of non-human actors to visualize the new strategy and to drive commitment within KLS PurePrint. Furthermore, the CCO illustrated the importance of their strategic change by putting up posters from the UN's Climate Reports around the facilities of melting icebergs and how the earth would change according to rising temperatures (Appendix 5). Both the pictures and the green cakes followed the change dimension of heterogeneity of factors mentioned by Hernes et al. (2015). The reason for this is that these non-human actors are important arbitrators when making sense of a change processes. Therefore, highlighting their importance allowed commitment to evolve towards the change.

Moreover, although the CCO referred to resistance during the introduction of the new strategy (Appendix 1), the Production Employee referred to it as "I think it is a fantastic idea. I love the nature." (Appendix 4, p. 5). Further the Chairman emphasized how the culture of KLS PurePrint changed when the CO2-strategy was initiated:

> "I think people stick together, they try to help each other, try to focus on what's actually was planned. I think that got them proud. I think that the employees felt deeply in their heart that they were trying to make a difference." (Appendix 6, p. 10)

This quote indicates the evolvement of commitment while making sense of the strategic change of Phase 2. As mentioned previously, in 7.2.3.1, the mentioned patterns of interacts became habitual, resulting in employees starting to feel proud and thus committed towards the new strategy (Hernes et al., 2015). The family ownership structure further created an ongoing commitment, which was utilized when implementing the CO2-strategy in Phase 2. This was implied by how the Chairman emphasized how the employees stacked together through the change process (Appendix 6).

As time passed, the employees familiarised themselves with the CO2-strategy by binding their actions towards the change. During the interviews two unique examples were mentioned regarding how the change was internally integrated and performed via behavioural commitment. Firstly, the Sales Employee emphasized, that:

> "[…] A lot of funny small things happened when we started up. A little thing, which I often tell people, is that normally when people has gone to the toilet, they leave the light on. From the day we started this, they began to cut off the light when they left the toilet, and I've never seen such things before." (Appendix 2, p. 2)

Secondly, the CCO mentioned, how an employee ran through the facility looking for him, after she had seen an external gardening company removing weed in KLS PurePrint's yard using a liquid containing pesticides. This had shocked her, as it was not aligned with their new CO2-strategy (Appendix 1). This exemplifies the dimension of contingencies of change, as the commitment was ongoing and based on interpretations of the CO2-strategy made by the employee in KLS PurePrint (Hernes et al., 2015). Therefore, both examples imply how the changes in personal interacts such as turning off the lights created patterns throughout the employee's habits (Hernes et al., 2015). These habits show the creation of social as well as interpretive commitment to the new CO2-strategy.

The act of the Sales Director to apply for a strategy competition, one year after the implementation of the CO2-strategy implies his social commitment to the change process (Appendix 3). This act indicates his personal drive and belief towards the new strategy (Hernes et al., 2015). However, the success of actually winning the competition was unforeseen, as the CCO had not thought that KLS PurePrint's CO2-strategy "had a chance" (Appendix 1, p. 18). However, the CCO mentioned the importance of the victory: "[...] I think it was perfect timing because we were beginning to doubt a little bit if actually somebody noticed what we had done. So, this little pet on the shoulders was very good for us at that time." (Appendix 1, p. 18). The external recognition and approval of the strategic change, by an external jury, allowed KLS PurePrint to believe in their own change. Hernes et al. (2015) describe such momentums as important "events in the actual process of change that have a bearing on the unfolding of the process of change." (p. 121). Thereby, the internal commitment towards the strategic change process of KLS PurePrint was strengthened.

Supplier Impact Mapping

The next driver for commitment was the supplier impact mapping. The CCO indicated his commitment that evolved from the results that were derived from the supplier impact mapping: "That was one of the big steps I think from 2007 to 2013" (Appendix 1 p. 18). The supplier impact mapping that was used of through the customer brochures and the product CO2-calculations did not only represent a non-human actor within KLS PurePrint but also a competitive advantage. It further displayed the climate impact of KLS PurePrint's operations, which generated arguments that could be interpreted by the employees themselves. These arguments were especially utilized by the Sales Department while selling different products to customers and allowed them to offer different CO2-emission options (Appendix 2).

Thereby, that the Sales Department used the supplier impact mapping during customer engagements, integrated ongoing commitment of the employees to the change process (Hernes et al., 2015). Therefore, it exemplifies the considerate power that a non-human actor has in order to fuel the narrative by making the strategic change comprehensible for the employees through its calculations. This represents the dimension of heterogeneity of factors (Hernes et al., 2015).

7.2.3.3 Narrative

The following analysis of the narrative will mirror the structure of the Strategy Phase 2 and the supplier impact mapping, mentioned in Commitment 7.2.3.2. This will be accomplished by utilizing Hernes et al. (2015)

Strategy Phase 2

By first approaching the strategy within Phase 2, the narrative of KLS PurePrint evolved from the previously described family business narrative in 7.1.3.3, towards becoming more professional by the means of the CO2-strategy. The old narrative of a family-owned company was centred on investments to make printing more efficient, which is why the company's investment strategy focused on machines and technologies (Appendix 1; 5; 6). The new investments such as buying an electric car, installing the white roof and joining the windmill cooperative were acts of committing resources towards the CO2-strategy and were therefore arbitrators of the new narrative (Hernes et al., 2015). The reason for that the narrative of KLS PurePrint evolved from this follows dimension two of forces at work (Hernes et al., 2015). Since the dimension outline the process of a shared narrative is ongoing, KLS PurePrint co-created the new narrative as part of the internal sensemaking, through creating new patterns of interacts within their daily work. This series of reactions are evolving as "narratives in turn engender social and interpretive commitment to the change process while setting the stage for new interacts" (Hernes et al., 2015, p. 125). The previously mentioned events such as department meetings, quarterly meetings and the annual assembly allowed for the employees to co-create a new narrative through active participation (Appendix 1; 2; 4).

Another possibility for the employees to embrace the narrative of the CO2-strategy was when they received the award mentioned in 7.2.3.1. The Chairman further described this event: "I think if we look at the first five to six years […], it was really a matter of making it relevant to the people. Why are we doing this? Why are we changing this?" (Appendix 6, p. 6). Hernes et al. (2015) refer to a

narrative as interconnected labels that synthesize different minds of people to one consistent picture. This can be exemplified by the employee who ran for the CCO as "watch guard" (Appendix 1, p. 18) and thereby securing the CO2-strategy. The action of the CCO to even tell this example implies how he used it to make sense of the CO2-strategy and indicated the developed commitment throughout KLS PurePrint. Thereby, the actions of the CCO and the running employee, both exemplify the commitment that created the necessary social force for KLS PurePrint to embrace the narrative of becoming carbon neutral (Hernes et al., 2015).

The CEO further emphasised during the interviews that his personal perception of climate change was shaped through various external influences. An example of this external influence were both the non-human actors of the movie "*An Inconvenient Truth*" portrayed by Al Gore and the oil crisis in the 70's (Appendix 5). The posters of climate change, mentioned previously, show how these external narratives were brought internally into KLS PurePrint. This action can be seen as an external narrative becoming included in KLS PurePrint's common narrative. However, this narrative process is not mentioned by Hernes et al (2015). This discovery will be further outlined and discussed in the Discussion in 8.2.1.

Supplier Impact Mapping

The creation of the supplier impact mapping created insight into the CO2-emission resulting from the resource of paper (Appendix 1). Even though the mapping appears to be a general tool to analyse their products, it also gave KLS PurePrint a tool to understand and to visualize their CO2-emissions. Thereby, it represents the dimension of contingencies of change as it further generated actions towards both customers via selling as well as employees through internal sensemaking (Hernes et al., 2015). The resulting momentum created from the actions allowed for the narrative to become the "greenest print house in Scandinavia" (Appendix 1, p. 3) to grow and build on the original narrative of just being a print house for producing print products.

7.2.4 Phase 2 Conclusion

The following conclusion answers the three sub-questions according to Phase 2.

Firstly, part 7.2.1 of the analysis showed how the management of KLS PurePrint's anthropocentric world view started to move towards becoming ecocentric after the year of 2007. This was rooted in

the implementation of the CO2-strategy, which was a tool to reduce the CO2-emission made by KLS PurePrint. This showed how the management of KLS PurePrint started to acknowledge nature's ecosystems and KLS PurePrint's impact on it. Furthermore, KLS PurePrint's new vision of becoming "the greenest print house in Scandinavia" (Appendix 1, p. 3) and the investment in a CO2-reducing roof indicated the same. However, as KLS PurePrint only utilized a reductionists approach, they were not fully embracing an ecocentric world view in Phase 2.

Secondly, part 7.2.2 of the analysis showed how the perspective on nature's ecosystems led to a transitional strategy (Borland et al., 2016). This is based on the new CO2-strategy and their vision. The CO2-strategy allowed KLS PurePrint to utilize one of the transitional 5Rs, namely reducing, which enabled KLS PurePrint to decrease their CO2-emission. However, it did not enable KLS PurePrint to remove all harmful chemicals, which results in that KLS PurePrint's operations were still emphasizing a cradle-to-grave process. Furthermore, this part of the analysis showed that the dynamic capability utilized by the management of KLS PurePrint in Phase 2 was seizing. This was enabled by the market overview created in Phase 1, which allowed KLS PurePrint to seize the area of sustainability and transform it into a competitive advantage. This further allowed KLS PurePrint's management to make investments that were aligned with this new market strategy and create a supplier dialogue around their new vision.

Thirdly, part 7.2.3 of the analysis showed how the change process in KLS PurePrint was supported by sensemaking. As KLS PurePrint introduced the CO2-strategy, it led to changes within interacts related to the goal of CO2-reduction. Employees had to internalize the new strategy, which resulted in activities such as creating the supplier impact mapping of portraying the CO2-emissions of their products. This created new patterns of interacts that evolved around the integration of the new strategy, which was strengthened through multiple non-human actors, such as the posters and the green cakes. Furthermore, KLS PurePrint received recognition as they won awards, which created commitment towards the new strategy and allowed the new narrative to evolve. Financial investments strengthened this commitment by new underlying principles, such as the white roof and the electric vehicles. The new vision of becoming "the greenest print house in Scandinavia" (Appendix 1, p. 3) became the new coherent narrative based on the previous history of KLS PurePrint, while focusing on the future of climate change.

7.3 Phase 3: 2013 and Onwards

In the following part of the analysis, the world view of the managers in KLS PurePrint, the resulting strategy and the utilized dynamic capabilities will be explored. Afterwards, sensemaking within this phase will be outlined. This corresponds to Phase 3 in Table 4.

7.3.1 World View

In the following, the world view of the management of KLS PurePrint in Phase 3 will be analysed to create an understanding for how they viewed sustainability during this time period. This will be done by applying Borland et al. (2016).

In 2013, KLS PurePrint initiated the idea of a strategic shift towards creating biodegradable products (Appendix 1). This shows how KLS PurePrint during Phase 3 started to view their company as a part of a closed loop with nature's ecosystem, and thereby emphasizing an ecocentric view (Borland et al., 2016). Furthermore, it demonstrates how the management of KLS PurePrint started to acknowledge how natures' ecosystems provide an important value and the importance of keeping it stable to cultivate life on earth (Pearce & Turner, 1990). This is as the ecocentric perspective highlights a cradle-to-cradle process, which implies that KLS PurePrint's systems, were able to operate in alignment with the natures' ecosystems without harming them (Borland et al., 2016). This emphasises how the management of KLS PurePrint did not see a hierarchy between themselves as humans and other species on the planet at this point in time anymore. Thereby, KLS PurePrint started to acknowledge Figure 3 of input-output with the environment (Pearce & Turner, 1990). This is therefore argued to be the beginning of when KLS PurePrint started to embrace ecocentrism (Borland et al., 2016; Pearce & Turner, 1990).

Moreover, due to the cradle-to-cradle strategy, the management of KLS PurePrint had to fully focus on the products and their individual processes, to be able to trace the entire process and what implications they had on nature. Thereby, the cradle-to-cradle strategy enabled KLS PurePrint to recognize a more holistic view of the ecosystem, where humans' roles are more decentralized, than in the anthropocentric perspective (Borland et al., 2016). Therefore, it is argued that the ecocentric view on sustainability was enhanced, where ecological sustainability was the objective, as it provides support to the existence of humans (Borland et al., 2016).

However, it can still be contested where KLS PurePrint is placed on the scale between the anthropocentric and ecocentric perspective today after the implementation of the cradle-to-cradle strategy. This is due to the fact that not all KLS PurePrint's products are cradle-to-cradle-certified (Appendix 5). But the CEO underlined that "it is rarely that we [KLS PurePrint] make a product that cannot be made into it" (Appendix 5, p. 14). This implies that the processes for being able to be ecocentric are most often present but that it is sometimes not achievable due to the complexity of the product. This results in that some products that KLS PurePrint produce still have an anthropocentric background and thereby creates an interruption and disturbance with the closed loop system of natures' ecosystems (Borland et al., 2016; Pearce & Turner, 1990).

7.3.2 Strategy

In the following, it will be explored how the strategy in Phase 3 was developed based on the managers in KLS PurePrint viewed sustainability. Further, it will be examined how the management utilized the 5 transformational Rs to perform the strategy. Both will be accomplished by using Borland et al. (2016).

In 2013, Board Member 1 was exchanged for a new one, namely Board Member 2. Board Member 1 has had a larger focus on sales and digital solutions, which were the skills that KLS PurePrint had valued him for in 2007 when he was elected. But due to the new strategic direction the CCO stated that: "I think he felt that it was difficult for him to give us more. And I think we had a little bit the same feelings" (Appendix 1, p. 4). The newly elected Board Member 2, who had a background in environmental science, was also the one who encouraged the management of KLS PurePrint to start fully emphasizing the actual product (Appendix 1). The CCO refers to her: "And she said: 'well it is fine with electric cars, windmill, all that, but you need to look into the product. You need to develop a biodegradable product, completely free of harmful chemicals'" (Appendix 1, p. 4). This highlights how the Board Member 2 thought that the strategy should be developed based on ecocentric assumptions, where ecological sustainability is taken into consideration. Thereby, the cradle-to-cradle strategy is defined as a transformational strategy and an eco-effective one (Borland et al., 2016; Braungart et al., 2007). The previous CO2-strategy from Phase 2, as argued in 7.2.2, had an eco-efficient approach by being a CO2-reduction strategy (Braungart et al., 2007). The Sales Director highlights how KLS PurePrint moved from focusing on being efficient to become effective:

> "[…] KLS [PurePrint] was actually on a point where we needed to do something different. […] How can we do it more effective? [...] But at that time in 2007, there was another thing we needed to do and not just follow the world on the same train making it [the products to a] lower price all the time. Because then we could see that there was no space for us, we cannot survive at those prices." (Appendix 3, p. 3)

The move from having a transitional strategy to having a transformational strategy can thereby be exemplified by the implementation of the cradle-to-cradle certification, which is a circular approach (Borland et al., 2016).

7.3.2.1 Transformational 5Rs

In order to achieve eco-effectiveness and following a transformational strategy, KLS PurePrint utilized the transformational 5Rs of rethink, reinvent, redesign, redirect and recover (Braungart et al., 2007). These transitional 5Rs will later on be connected to the ecocentric dynamic capabilities in 7.3.2.3, following Borland et al. (2016).

Rethinking of the printing products is shown by how the management of KLS PurePrint both have engaged into the food industry by attaining a food certification and creating the Treatbox (Appendix 1; 4). This is rethinking the traditional way for KLS PurePrint to conduct business and displays a new mean for them to fill a function that is better for the environment (Borland et al., 2016).

Reinventing can be exemplified by the way that KLS PurePrint in the years between 2014 and 2017 tried out a new product idea of printing reusable banners with metallic stands for companies to rent (Appendix 5; 9). The rentable banners were printed and sent together with the stands to the costumers in a package that could be returned when the companies where done with using them. Further, KLS PurePrint offered to keep the banners archived if they were going to be used again, otherwise they would be recycled. Unfortunately, the product idea was not profitable enough compared to competitors who offered single use roll-ups that were produced cheaper (Appendix 5; 9). However, this product idea was an innovative product idea of KLS PurePrint, where they came up with a new circular business concept (Borland et al., 2016).

Redesigning can be exemplified by how KLS PurePrint redesigned their value chain and their production processes in order align it with ecological sustainability (Borland et al., 2016). This can

be illustrated by how KLS PurePrint had to utilize external stakeholders to produce biodegradable ink-colours:

> "We could not produce paper, printer colours and a lot of ingredients that we put on the paper as spray powder, glue and such things. We, as a small company could not do that and be the best at it. But we got other people to help us. And there, we have been collaborating on a European level." (Appendix 5, p. 2)

The redesigning of KLS PurePrint's value chain thereby included an expansion of the company's knowledge and skills via external stakeholder to find solutions to achieve the transformational strategy.

Redirection highlighted by Borland et al. (2016) can be seen as partly taken care of in KLS PurePrint due to the cradle-to-cradle certification, as the products are biodegradable. Thereby, they do not include any technical toxics that need to be redirected into the technical cycle (Ellen MacArthur Foundation et al., 2015; Webster, 2017). Therefore, the management of KLS PurePrint has kept the technical cycle out of their strategy and did not need to focus on keeping it separated from the biodegradable cycle. If the products had included technical toxics, this separation would have been crucial for the circular flow to function (Borland et al., 2016; Braungart et al., 2007; Webster, 2017).

Recovering, mentioned by Borland et al. (2016), has only partly been found in the gathered data. As mentioned within reinventing above, KLS PurePrint tried out a business idea of renting out roll-ups between 2014 and 2017 (Appendix 5). This implies an attempt to fully close the circle by taking back the products they sell and reuse them for new products, which is the objective of recovering (Borland et al., 2016). Other than that, the interviewees have not mentioned how they take responsibility for that customers follow the circular system by for example composting PurePrint products. Therefore, there is a risk that the cradle-to-cradle produced products are not being reused in a new production and thereby not kept at their highest value (Borland et al., 2016; Webster, 2017). This will further be highlighted in the Findings 8.1.

7.3.2.2 An Ecocentric Vision

To have an ecocentric vision is of great importance in order to fully embrace ecological sustainability and to create a transformational strategy (Borland et al., 2016). This ecocentric vision can be found in KLS PurePrint as the CCO mentions:

> "[…] We need some more ambitious goals and that was when Gitte [Board Member 2] said: 'well, look into the product.' I think we were missing some more ambitious targets at that time. And that was when we switched it [the vision] to the greenest print house in the world." (Appendix 1, p. 6)

The updated and enlarged vision, from approaching not only Scandinavia but also the entire world, created a grander sustainable vision to strive towards (Appendix 1). The implementation of this updated vision indicates a sign from the management's side of how they also felt the need to update their managerial mindset, in order to embrace ecological sustainability on a higher level. Furthermore, Borland et al. (2016) emphasize the importance of a long-term mindset. This mindset was expressed by CCO:

> "It was difficult for us to even look three months ahead and actually see if we would be in the market three months ahead. So it was kind of funny, [we were] really having problems to be three months ahead and then [we were] discussing: 'where should we be in three years?' Because to be honest, I really didn't think we would survive the three months." (Appendix 1, p. 11)

The quote indicates KLS PurePrint's bold vision towards the future, although they were struggling to stay in business. Moreover, the developed managerial mindset towards ecological sustainability can also be demonstrated by how KLS PurePrint looked for strategic collaborators in order to receive support in their work towards circularity. This resulted in the collaborations with both Gugler, starting in 2015, and then Vögeli joining in 2016 (Appendix 1; 7). These two European print houses were also approaching circularity through the cradle-to-cradle certification (Appendix 1). Borland et al. (2016) argue how collaborations support the creation of ecological sustainability visions. The CEO of KLS PurePrint underlined this further when talking about Gugler and Vögeli: "We help each other! We are not competitors! We are together in this! And it is an amazing way of thinking" (Appendix 5, p. 14). Hereby, the ecocentric vision mentioned by Borland et al. (2016) is exemplified as an important driver for KLS PurePrint's collaborations.

7.3.2.3 Ecocentric Dynamic Capabilities

In the following, it will be outlined how the management utilized the ecocentric dynamic capabilities of maintaining, remapping and reaping in order to create the cradle-to-cradle strategy. Further, the

ecocentric dynamic capabilities will be reconnected to the transformational 5Rs outlined previously in 7.3.2.1. This will be performed by applying Borland et al. (2016).

Maintaining

The cradle-to-cradle strategy entailed a way for KLS PurePrint's managers to take action to keep their competitive advantage of embracing sustainability strategically. Thereby, this action can be seen as a way of the management to reconfigure the company's resources, hence the third dynamic capability of maintaining (Borland et al., 2016; Teece, 2007). For this dynamic capability to function, and for the cradle-to-cradle strategy to be carried out, KLS PurePrint engaged in collaborations. This was done to ease the technically heavy process of adapting a circular process, based on its high costs:

> "They [Gugler] were further than us in some areas […] We divided the costs and helped each other to keep on going. We got Vögeli in […] a couple of years later and they paid their way in" (Appendix 5, p. 13)

This example of strategic collaborations also highlights how the overall characteristic of professionalization within KLS PurePrint, was changed after the implementation of the cradle-to-cradle strategy. Instead, a new characteristic of being collaborative had become more salient, which is a common characteristic for circular companies (Borland et al., 2016; Braungart et al., 2007; Webster, 2017). Hereby, the transitional R of redesigning can be mapped on to the dynamic capability of maintaining (Borland et al., 2016). This is since KLS PurePrint expanded their knowledge and skills by including new collaborations with Gugler and Vögeli and thus redesigning their value chain.

Remapping

The dynamic capability of remapping is one of the additional ecocentric dynamic capabilities that are necessary to create circular processes (Borland et al., 2016). Remapping includes that the management creates an understanding of all the materials that are part of their products and product processes (Borland et al., 2016). Therefore, the remapping process that was needed in order to implement the cradle-to-cradle strategy will described by 5-step process of moving from eco-efficiency to eco-effectiveness (Braungart et al., 2007). The 5-step process was of great importance for KLS PurePrint since the management at that time was not sure about what chemicals were included in the materials that they received from their suppliers:

> "In 2013 we just said: 'We don't know if it's actually already compostable without harmful chemicals. We are Svanemærket [have the Swan Eco label] in the Nordic Eco label. We have had this since 1997. […] We had help from some consultants and found out that we needed to develop and look into all our materials, completely from scratch." (Appendix 1, p. 4)

An investigation of this 5-step process follows in the next paragraph. Moreover, following Borland et al. (2016), the transformational R of redirection, analysed in 7.3.2.1, can be applied to the ecocentric dynamic capability of remapping. The reason for this is that KLS PurePrint made their products biodegradable. However, as mentioned, KLS PurePrint did not utilize the technical cycle of the value circle (Webster, 2017).

5-Step Process

Due to the help from external consultants, KLS PurePrint managed to go through the 5-step process outlined by Braungart et al. (2007). This activity increased the knowledge that KLS PurePrint had around their product as they had to map out what type of materials to include and exclude in order to keep the end-product biodegradable (Appendix 1). These two steps are defined as free off and personal preferences (Braungart et al., 2007). Further, KLS PurePrint emphasized how normal paper only can be recycled to 75% of the total volume, which implies that 25% of the volume goes to waste in the process (Appendix 8; KLS PurePrint 3, n.d.). This issue is caused by ink and filler materials. In order to make all paper fully recyclable, KLS PurePrint chose to make their products biodegradable and was thereby not utilizing any technical materials (KLS PurePrint 1, n.d.). As mentioned previously, KLS PurePrint is therefore not utilizing the full value circle, as the technical cycle is not included in the product process (Ellen MacArthur Foundation et al., 2015; Webster, 2017). This implies that KLS PurePrint did not have to create the third step of passive positive list, as the management did not have to differentiate between any technical or biological materials (Braungart et al., 2007). This further excluded the fourth step of the active positive list, where the product's final ingredients are being defined as either technical or biological material (Braungart et al., 2007). The fifth step of reinvention can be seen as when KLS PurePrint offers the service of purchasing an environmentally friendly cradle-to-cradle option to their customers compared to their normal product (Appendix 3). This way of exemplifying reinvention does not completely align with Braungart et al.'s (2007) 5-step process. This is as they suggest that the product shall stay owned by the company and

only be used by the customers. Thereby, the end-product that is described by Braungart et al. (2007) rather emphasizes a service than a consumption product. The reusable roll-ups, mentioned in the Transformational 5 R's in 7.3.2.1, can therefore be seen as a more aligned example with this type of service, if they were still one of KLS PurePrint's business concepts.

The 5-step process, described above, was creating a foundation for what later turned out as the Roadmap. The Roadmap is as an external document that is given by the consultant that certifies cradle-to-cradle companies (Appendix 1). Further, it is a tool that helped KLS PurePrint to keep on overview of their processes towards getting a higher cradle-to-cradle certification (Appendix 1). The reason for this is that the Roadmap outlines what improvements that are needed for the different areas of material health, material reutilization, renewable energy, water stewardship and social fairness, which are the five quality criteria of the cradle-to-cradle strategy (Cradle to Cradle 2, n.d.).

Reaping

The dynamic capability of reaping is the second additional ecocentric dynamic capability (Borland et al., 2016). It can be exemplified within KLS PurePrint in terms of the recognition the management have received throughout the years, but especially since the implementation of the cradle-to-cradle certification. This is due to the fact that KLS PurePrint won Hvidovre Municipalities Climate Award in 2013 and became the Enterprise of the Year in Hvidovre in 2016 (KLS PurePrint 1, n.d.). These rewards can be characterized as non-monetary profit that is emphasized by Borland et al. (2016), as they are both strengthening KLS PurePrint's reputation and status.

The PurePrint label that KLS PurePrint co-created with Gugler further represents the ecocentric dynamic capability of reaping (Borland et al., 2016). The label is open for other companies to join via investments since the intention with the label is to spread knowledge around circularity (Appendix 5). The label creates recognition, which increased the chance of creating further collaborations with other print houses. Moreover, this type of concept is an innovative solution that Webster (2017) refers to in the meaning of holistic systems that create long-term advantages. Further, Webster (2017) highlights the collaborative approach as essential in order to create circular business models, due to high costs of innovation and research. The CCO of KLS PurePrint emphasized this as they co-created the label with Gugler in 2015: "[…] [KLS PurePrint] could actually share the costs, since it was extremely expensive. We had already at that time some materials […] and they had some. Then we decided to join." (Appendix 1, p. 7). Thereby, the collaborative approach eased the high costs that

represented a barrier for KLS PurePrint to enter the world of circularity (Appendix 1; 5). The CEO further underlined this restraint that many companies experience when approaching circularity:

> "If companies want to start from scratch, it is huge work! And I think there are a lot of my colleagues here in Denmark that have thought about doing the same. And then they asked about what was needed and said: 'ohh, is that what is needed?' And then backed out, because it is a big deal" (Appendix 5, p. 13)

Thereby, the sharing of both knowledge and costs can be viewed as lowering the barrier to embrace circularity and thereby KLS PurePrint performing the ecocentric dynamic capability of reaping (Borland et al., 2016).

One important event, which generated knowledge and a foundation for the ecocentric dynamic capabilities of reaping to take place, was when Board Member 2 entered the Board of Directors. This was due to her academic and professional background in business and biology (Center for Cirkulær Øknonomi, n.d.). Her knowledge contributed to the decision of changing the transitional strategy into a transformational one. By doing this, the management of KLS PurePrint was able to create a strategy that emphasized ecological sustainability and thereby utilize the two ecocentric dynamic capabilities, remapping and reaping (Borland et al., 2016). Moreover, the Chairman underlined the importance of KLS PurePrint moving from a traditional to a transitional and finally to a transformational strategy:

> "I think that […] the ability to understand and combine sustainability, production and business into concepts [is of importance] because if we haven't been able…If we have just been sustainable, we could have risked getting into green washing. So only something we said, not something we did. But I think that one of the success factors was that we were telling the same story, coherent. I think that is something that has really made it to a success." (Appendix 6, p. 10)

Hereby, the Chairman highlights the importance of fully embracing ecological sustainability, and thereby circularity, rather than solely sustainability, as in the transitional and traditional world view. Borland et al. (2016) state that "with a transformational strategy, firms can claim genuine sustainability status for their products rather than green washing" (p. 300).

At last, the transformational R of recovering is troublesome to apply to the ecocentric dynamic capability of reaping as suggested by Borland et al. (2016). This is due to how KLS PurePrint has not taken the full responsibility for their circular approach and integrated it towards their customers down

their value chain. Thereby, the direct connection between recovering and reaping is not found in KLS PurePrint. This will further be touched upon in various ways in the Discussion 8.

Second Maintaining Through the SDGs

After the management of KLS PurePrint had integrated the cradle-to-cradle strategy within their company's processes, they decided to further implement the SDGs, which were published by the UN in 2015. The management of KLS PurePrint integrated them in 2017 since they saw them as a "great way to communicate, and then having the same framework to communicate with our [their] customers companies and public organizations" (Appendix 1, p. 8). However, they also saw them as a tool to use internally to "tell our [their] employees that we [they] are not just producing print or packaging. We [they] are tapping into climate change, plastic problems, chemical problems. And that's what we do with the three targets [SDGs]" (Appendix 1, p. 9). Since the SDGs were initiated by the UN, they became an important framework for companies to apply in order to stay updated and competitive (Gerard et al., 2016). Therefore, the implementation within KLS PurePrint can be seen as the management using the dynamic capability of maintaining (Borland et al., 2016). This is since they used their capacity "to maintain competitiveness" (Borland et al., 2016, p. 303) by reconfiguring their business model again. The reconfiguring process is argued to be important for ecocentric strategies since it allows and demands companies to transform themselves to stay ecological sustainable (Borland et al., 2016).

The management of KLS PurePrint implemented the SDGs into their business model in different ways. They saw them, as mentioned above, as a tool to use internally with the employees and as an external communication and sales tool towards customers (Appendix 1). The Chairman mentions how he saw the implementation of the SDGs as "maybe the last change going on top of the cradle-to-cradle [certification]. Making this even suit into an international take on strategy" (Appendix 6, p. 13). Thereby, he highlighted how the SDGs created an opportunity for KLS PurePrint's management to create a strategic improvement, which helped them to maintain a future competitive advantage following Borland et al. (2016). Moreover, KLS PurePrint saw the SDGs as a product opportunity and developed cardboard cubes for other companies to buy (Appendix 6). However, the Chairman was doubtful if KLS PurePrint utilized their SDG products as well as the framework itself to the best possible extent:

> "Many places where I go for meetings, for networks, whatever, they are having their cubes standing everywhere. Not much on them is saying KLS PurePrint unless you look on the bottom of them. Is that good or bad? Is KLS PurePrint driving a development, which they are not utilizing fully for their own benefit? One thing is the management using more time preaching [about them] than running the company." (Appendix 6, p. 13)

It can thereby be argued that the management of KLS PurePrint and the Board of Directors viewed the utilization of the SDGs in different ways, which created misalignment. Therefore, it can be questioned if the managers in KLS PurePrint are handled the dynamic capability of maintaining in connection to the SDGs in the most beneficial way. It further puts light on the ability to generate trust and to develop a culture in companies so that can embrace these new initiatives that move further than the dominant social paradigm that is the norm in companies and society (Borland et al., 2016; Geels, 2002). The processes around trust and commitment to the SDGs will be analysed more detailed in 7.3.3.2.

At last, the transformational R of redesigning can be applied to second maintaining (Borland et al., 2016). This is due to how the SDGs "embrace ecological requirements" (Borland et al., 2016, p. 304) defined by the UN and thereby support ongoing definition of sustainability.

7.3.3 Sensemaking

The analysis of sensemaking, following Hernes et al. (2015), will be achieved through exploring interacts, resulting patterns of interacts and the evolved commitment. Hereafter the created narrative will be investigated. The resulted sensemaking will be subsumed within the conclusion of Phase 3. This corresponds to Phase 3 indicated in Table 4.

7.3.3.1 Interacts and Patterns of Interacts

Interacts and the resulting patterns of interacts will be explored by investigating the drivers within the strategic change process of Phase 3. The main drivers that created interacts between the employees of KLS PurePrint were the strategy, the supplier impact mapping, the collaborations and the integration of the SDGs. In the following, these drivers will be analysed in depth.

Strategy Phase 3

Phase 3 started similar to Phase 2 in the year of 2007 and was therefore making use of the previous implemented patterns of interacts. One pattern that reoccurred in 2013 was when the Board of Directors decided to exchange Board Member 1 after six years and brought in Board Member 2 (Appendix 1; 6). As mentioned in 7.3.2, Board Member 2 did not only bring new ideas, but also knowledge within business and biology (Center for Cirkulær Øknonomi, n.d.). The pattern of updating the setup of the Board of Directors, by including external knowledge, therefore became a pattern of interacts within KLS PurePrint (Hernes et al., 2015). Moreover, the implementation of a new strategy had become habitual from Phase 2. Therefore, the repetition of the change process, following the contingencies of change dimension, laid the foundation to develop a new strategy in Phase 3. This highlights additionally the dimension of temporalities of change, as the learning from Phase 2 were brought into the present by repeating the process during the change of Phase 3 (Hernes et al., 2015).

However, the implementation of the cradle-to-cradle strategy also created a new set of interacts within KLS PurePrint. The reason for this was that KLS PurePrint was obliged to take action on the assessment criteria of the Roadmap mentioned in 7.3.2.3, which created new patterns of interact throughout the company (Hernes et al., 2015). The Sales Manager highlights his patterns of interact with the Roadmap:

> "We had to know all the criteria for cradle-to-cradle: the bronze, the silver and the gold. We knew a lot about it, because otherwise, we could not help customers to understand what we were talking about. […] we had a lot to learn a lot" (Appendix 2 p. 4)

This knowledge of the cradle-to-cradle strategy, which further could help the Sales Department to create new sales arguments, was facilitated by courses and presentations by Board Member 2 (Appendix 3). Further, the Production Employee pointed out that: "we use the pyramid. We are drilled with it" (Appendix 4, p. 6). The pyramid he refers to, is a visualization of how KLS PurePrint's different strategic key implementations are connected, which can be seen in Figure 10 below (Appendix 7).

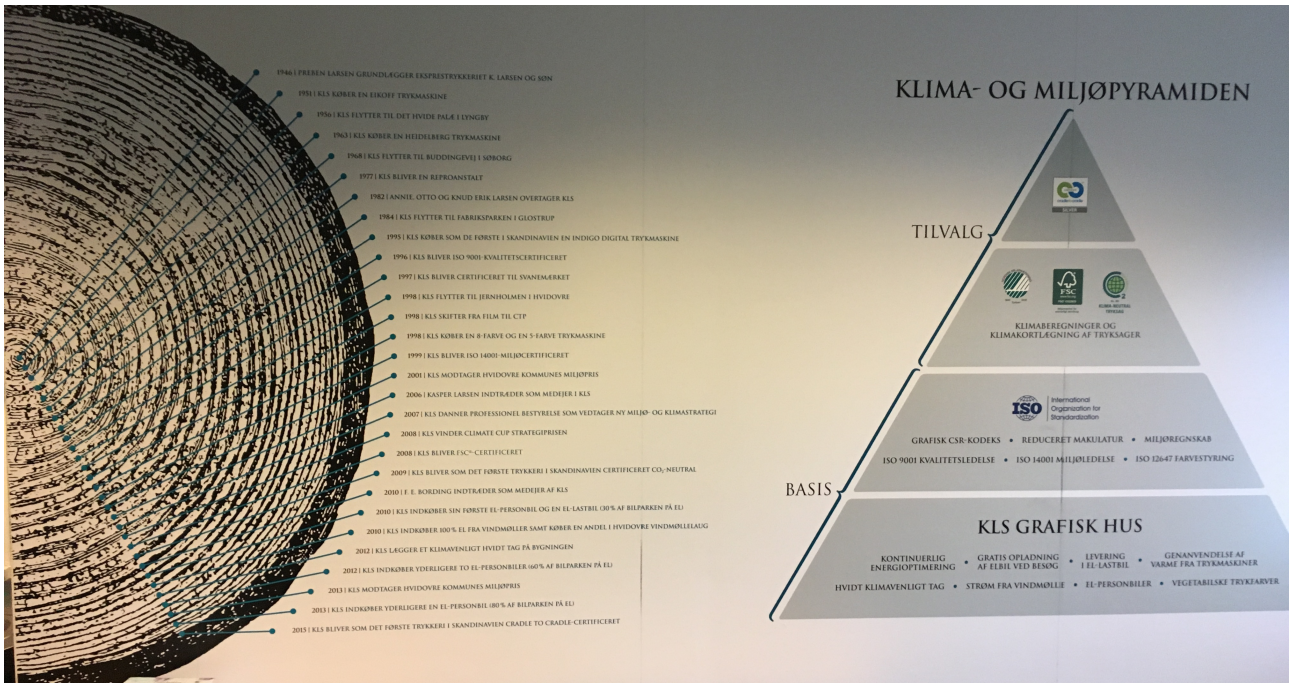

Figure 10: Climate and Environmental Pyramid

The pyramid presents a non-human actor that visualizes the change process towards circularity for employees and thereby emphasizes the dimension of heterogeneity of factors (Hernes et al., 2015). Moreover, it creates patterns of interacts by connecting it to past events and thereby creating commitment (Hernes et al., 2015). The CCO emphasized how the action of putting the cradle-to-cradle on the top of the pyramid underlines "[…] the hierarchy between them [the strategic key implementations]" (Appendix 7, p. 5). Since the cradle-to-cradle logo is placed on the top of the pyramid to be seen by employees and customers, its importance is highlighted and thereby driving acts towards familiarising with them.

Supplier Impact Mapping

The second repetition of patterns occurred around the supplier impact mapping as part of the beginning of the cradle-to-cradle certification process. The patterns of interacts that evolved during strategy Phase 2 mentioned in 7.2.3.1, were repeated during the Phase 3 mapping. However, the criterion changed from only including the CO2-impact to the five cradle-to-cradle quality criteria

(Cradle to Cradle 2, n.d.). The employees were therefore able to use their created patterns of interacts and to apply them to the new circular criteria (Hernes et al., 2015). The succeeded carbon neutrality from their changes towards wind energy gave them a direct high score within the criterion of 'Renewable Energy and Carbon Management' (Appendix 1). Nevertheless, the next supplier impact mapping indicated lack of work within the areas of 'Material Health' and 'Material Reutilization' (Appendix 1). This required KLS PurePrint to perform an in-depth assessment of the sourced materials with help from external consultants, which created new interacts (Hernes et al., 2015).

During the certification process, other independent organisations, trained by the Cradle-to-Cradle Institute, assessed KLS PurePrint and their product processes (Appendix 1). Those independent organisations evaluated KLS PurePrint based on their actions upon the five quality criteria resulting in the overall product scoring bronze (Figure 11).

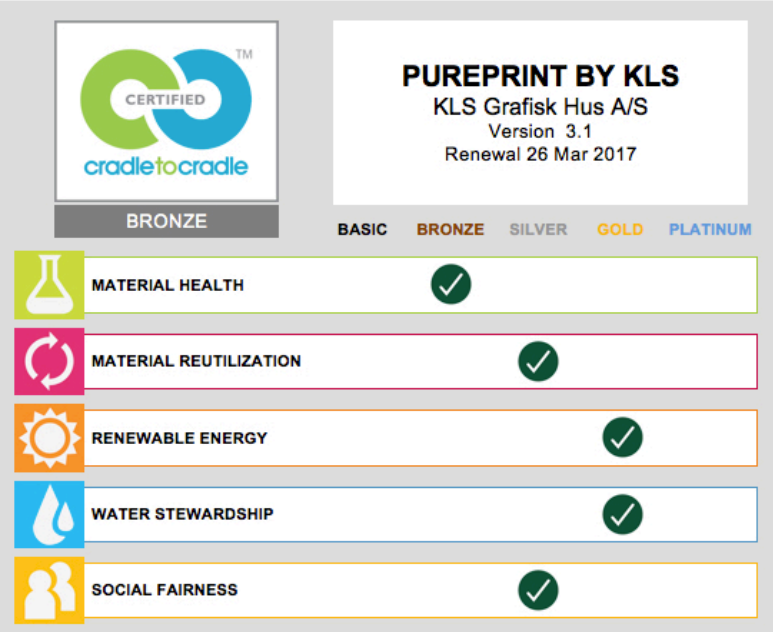

Figure 11: First Product Scorecard of KLS PurePrint 2015 (KLS PurePrint)

The consultants did not only help to evaluate the KLS PurePrint actions, but further generated the Roadmap, mentioned previously in 7.3.2.3 which guided KLS PurePrint to achieve the next level of certification (Appendix 12). In order for KLS PurePrint to follow the Roadmap, new patterns of interacts were created, since it required new actions performed by the employees. During the second evaluation regarding the product scoring in 2017, KLS PurePrint improved and reached the second

mark and became silver (Figure 12), which created a new Roadmap for the third assessment cycle coming in 2020 (Appendix 1; 12).

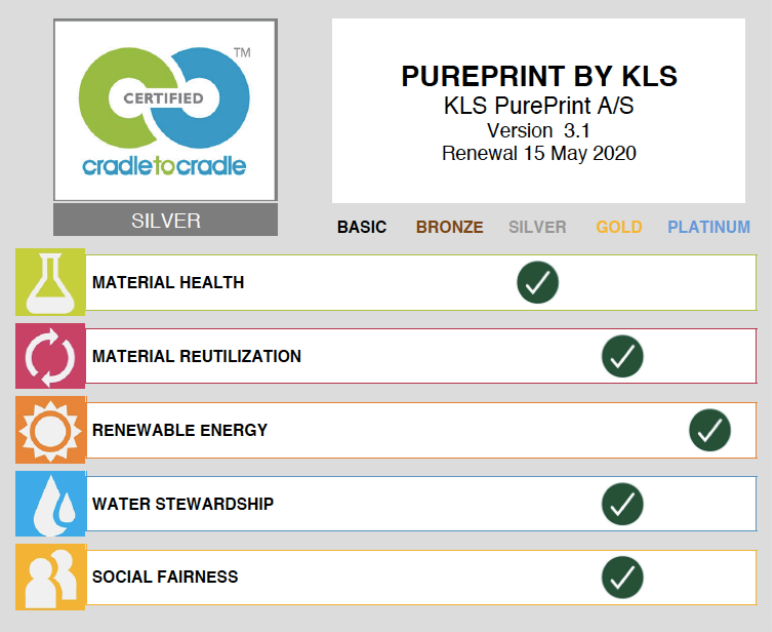

Figure 12: Second Product Scorecard of KLS PurePrint 2018 (KLS PurePrint)

Thereby, it is shown how the integrated patterns of interacts around the cradle-to-cradle certification led to improvements across the five quality criteria.

Collaborations

Three new interacts and resulting long-term patterns appeared within Phase 3 through various collaborations. Firstly, around the development of new processes of toxic free materials together with suppliers, secondly a collaboration with other print houses and thirdly by changing industry federation.

During the second supplier impact mapping, KLS PurePrint realized that the creation of especially biodegradable ink was troublesome (Appendix 1; 5). Therefore, the management contacted their suppliers with the aim to create a collaboration for product development (Appendix 1; 5). This involvement with their suppliers created issues as the CEO indicated that KLS PurePrint was not taken seriously by suppliers when suggesting the co-development of the cradle-to-cradle certified ink

(Appendix 5). However, a Dutch company was interested in taking on the challenge and a collaboration was established (Appendix 5). This created new social interacts that was connected to the cradle-to-cradle criteria.

Furthermore, KLS PurePrint screened the European market for cradle-to-cradle certified print houses and found the Austrian print house Gugler (Appendix 1). The interaction between the two companies evolved through a visit in Austria, which established interacts of a further valuable collaboration for knowledge and cost sharing (Appendix 1). Thereby, the collaboration developed into obligations towards each other's change process on the path of creating circular print solutions, following the cradle-to-cradle certification. This indicates how the ambiguity of knowledge led to a collaboration and thereby to new actions, which describes the contingencies of change as one situation lead to the other (Hernes et al., 2015). Further, KLS PurePrint used the ongoing activity of the collaboration as an arbitrator to drive their internal change (Hernes et al., 2015). This was further verified when Vögeli joined the collaboration after Gugler in 2016.

Lastly, the management of KLS PurePrint took the decision to change from the graphic industry federation called Grakom to the Danish Industry Federation, Dansk Industri, in 2018 (Appendix 1; 7). The CCO explained the underlying reason for changing federation: "We don't want to talk to our competitors, because I think a lot of them is going the same way as they have always, always done" (Appendix 1, p. 23). The change of federation implied a new creation of interacts, not only with Danish print houses, but further with companies from different industries. This follows the coherence of integrating new knowledge and insights, as KLS PurePrint had done before with external Board Members, as well as collaborations. Furthermore, the Sales Director and the CCO implied during their interviews, that KLS PurePrint vision is not only to provide print, but also to solve the problems of tomorrow (Appendix 1; 3). The CCO stated:

> "We [KLS PurePrint] are trying to contribute to the climate agenda. We are trying to solve some plastic problems in the world. We are trying to solve chemical problems in the world." (Appendix 1, p. 8).

This entails how the CCO embraced a larger sustainable vision that includes more than solely the print industry.

SDG Integration

As mentioned in the Case Description 2.3, KLS PurePrint started to integrate the SDGs within their company in 2017, after the UN created the goals in 2015 (Appendix 1). During the visits to KLS PurePrint, it was made clear how big of an impression the SDGs have made on them as a company. This was further entailed by how the management has created possibilities for KLS PurePrint's customers and employees to interact with the SDGs through non-human actors such as the SDG cubes (Hernes et al., 2015). Figure 13 below indicates various examples, such as SDG cubes and window decoration, of the visualization of the SDG throughout the facilities of KLS PurePrint. This underlines how the management has applied the framework created by the UN to the agenda of KLS PurePrint (Figure 13).

Figure 13: Utilization of the SDGs at KLS PurePrint

Nevertheless, all employees, apart from management, were not able to answer the interview questions regarding the SDGs (Appendix 2; 3; 4). However, the CCO elaborated on them and highlighted the implementation process of an employee workshop (Appendix 1; 2; 4). This lack of employee knowledge indicates how interacts with the SDGs were not sufficient enough to create knowledge throughout the different organizational levels of KLS PurePrint. For example, the Production Employee answered: "I probably know about them but I don't know how I would define them." (Appendix 4, p. 3) when asked about his knowledge around the SDGs, while the CEO answered: "It is mostly Kasper [CCO] that [works with them]" (Appendix 5, p. 7). The reference by the CEO regarding the CCO, as the main person interacting with the SDGs, also represents the knowledge distribution across the interviews. Only the CCO elaborated on the SDGs and their integration process that took place with the Sales Department and rest of the management. This implies the interpretive

commitment that he has towards the SDGs and indicates his personal patterns of interacts around them as he can elaborate on the process of using it (Hernes et al., 2015). The CCO's patterns of interacts can also be explained by his multiple external presentations via the UN Global Compact in Denmark (Appendix 1). Further, he described that the integration process was consisting of finding SDGs that already fit the Phase 3 strategy of being cradle-to-cradle certified. This was as the cradle-to-cradle strategy was already settled when the UN launched the SDGs (Appendix 1; 7).

Moreover, the Sales Director brought cards representing the SDGs to the interview to show and talk about, which implies how he also had created patterns of interacts (Hernes et al., 2015). However, all sales related employees that were interviewed referred to the SDGs as tool for communication, which the CCO highlighted by: "[…] I think it is a framework for communication for us that we are in these SDGs together with our suppliers and customers." (Appendix 7, p. 3). Therefore, the patterns of interacts that evolved throughout KLS PurePrint were concerning external utilization in regard to highlight their cradle-to-cradle strategy, rather than internal strategy creation (Appendix 7). These examples indicate how there has been a lack of interacts, and thereby patterns of interacts, around the implementation and utilization of the SDGs in KLS PurePrint. Following Hernes et al. (2015), this implies a lack of created commitment, which will be further explored in the SDG Integration 7.3.3.2.

7.3.3.2 Commitment

The commitment towards the new strategy within Phase 3 evolved around the newly created patterns of interacts mentioned above such as the Strategy Phase 3, the supplier impact mapping, collaborations and the SDG Integration. Therefore, the exploration of the created commitment follows the same sequence by utilizing Hernes et al. (2015).

Strategy Phase 3

Firstly, the commitment evolved through the implementation process of the cradle-to-cradle strategy itself. As mentioned above, the patterns of interacts reoccurred, therefore making it easier for employees to follow. The Sales Manager describes this process:

> "The cradle-to-cradle was just a part of that coming naturally. Because when you want to be green, it is a natural way to go. So, I didn't think there were any difference in it. It just got more specific when we came to the cradle-to-cradle instead of just talking strategy." (Appendix 2, p. 5)

The coherence between the previous CO2-straregy and new cradle-to-cradle strategy, as the natural sequential step to follow, indicated by the statement, implies how the Sales Manager felt connected to the strategic change process through its consistency. The ongoing process throughout the three phases of adding the strategies flowingly, allowed the employees fluently to adapt and commit socially and interpretively (Hernes et al., 2015). Moreover, the cradle-to-cradle certification itself gave KLS PurePrint specific targets to measure their own performance against. This created internal commitment to meet the expectations of the Roadmap. The resulting recognizable patterns of interact of fulfilling the requirements of the Roadmap, within the five quality criteria, created the interpretive commitment of the employees towards the cradle-to-cradle certification. The Sales Manager explains the commitment:

> "I think that the easiest way to explain it is that we, by doing this [cradle-to-cradle printing we] suddenly got some other priorities we could sell to the customers when we want to sell and it has been very positive." (Appendix 2, p. 3).

While the employees indicated their commitment towards receiving the certification, the CCO mentions, how the previous strategy in Phase 2 had helped KLS PurePrint to succeed within quality criteria of 'Renewable Energy and Carbon Management', mentioned in 7.2.3.2. Additionally, while the cradle-to-cradle integration of biodegradable and chemical-free products is highly technical and specific, the employees did not see it as difficult as cited above (Appendix 2). Moreover, the financial commitment by the management to invest in the development of chemical-free products, that do not harm nature and humans, aligns with the internal justifications of actions (Hernes et al., 2015). To bind financial resources to the new strategic vision of creating cradle-to-cradle certified products states binding actions, which results in commitment (Hernes et al., 2015). This change was further highlighted as KLS PurePrint changed their corporate name and logo from "*KLS Grafisk Hus*" to "*KLS PurePrint*" as indicated in Figure 14 below.

Figure 14: Change of Corporate Name and Logo (Klock, n.d.; KLS PurePrint 1, n.d.)

The integration of the created print method PurePrint within the corporate name, indicates the explicit, public and irrevocable commitment towards the change (Weick, 1995, mentioned in Hernes et al., 2015). Both the colour, logo and name change highlighted the corporate commitment to KLS PurePrint's future direction of becoming a green print house that identified itself as pure and connected to nature via the leaf (Figure 14). As a corporate logo and name represent a highly irrevocable act, this change created interpretive commitment towards the vision in KLS PurePrint (Hernes et al., 2015).

Supplier Impact Mapping

The supplier impact mapping had already created habitual interactions, as the Sales Department indicated their new sales arguments during the strategic Phase 2 in 7.2.3.1. The second supplier impact mapping for the cradle-to-cradle certification step such as 'Material Health', built upon the habitual interactions, which led to interpretive commitment (Hernes et al., 2015). While employees had to learn new arguments, as elaborated upon previously, courses from the Board Member 2 made the commitment unquestioned (Appendix 2; 3). Again, following the argument of the sequential addition of the previous CO2-strategy, the commitment and changes were not questioned, as they were towards the common sense of doing 'good'. Moreover, during the interview with the CEO, he elaborated extensively on the process of the supplier impact mapping in both in Phase 2, as well as Phase 3 (Appendix 5). His through knowledge and detailed way of describing the different steps indicated his personal commitment towards the changes by using the same process repetitively in Phase 3. Following Hernes et al. (2015), the CEO's personal commitment towards the supplier impact mapping, indicated the strong interpretive commitment of making sense of the past changes as they influenced the future.

Collaborations

The previously mentioned collaboration with Gugler and Vögeli was further a driver for the creation of commitment in KLS PurePrint. All four interviewees on managerial level mentioned the crucial role of the co-creation of the PurePrint production technology and the label (Appendix 1; 3; 5; 6). The CEO emphasised this collaboration by stating: "We help each other!" (Appendix 5, p. 14). This statement exemplifies how the collaboration drove commitment by the feeling of creating something together with the collaborators. Thereby, the sharing of knowledge and development costs drove the creation of interpretive commitment towards the idea of eliminating chemicals together.

Additionally, the change of industry federation from Grakom to the Danish Industry Federation, Dansk Industri, implied interpretive commitment. This follows their commitment to change from being solely printers into approaching global environmental issues. Moreover, the creation of the food box called Treatbox in 2017, represented one innovation that was driven by the new commitment of global environmental change agents, since it targeted the issue of food waste. At last, the fact that KLS PurePrint is currently working on receiving a food certification, in order to produce food packaging, also emphasizes interpretive commitment (Hernes et al., 2015).

SDG Integration

The previous exploration of interacts around the SDGs within KLS PurePrint in 7.3.3.1 has indicated a lack of interacts across the employment levels. Thereby, the employees did not feel familiar with the 17 goals and have therefore not created interpretive commitment towards them. Following Hernes et al. (2015), commitment evolves from interacts and patterns of interacts. Due to that the patterns of interacts around the SDGs were missing, the resulted commitment has not evolved. For example, the Sales Manager mentioned: "I know we have seven [SDGs]. [...] But I don't know what we're doing, actually with them." (Appendix 2 p. 1). This highlights his limited commitment based on his lack of interacts, which results in him only knowing the seven goals that is utilized for customers meetings. Further both the Sales Manager and Production Employee were not able to indicate knowledge about KLS PurePrint process around the SDGs (Appendix 2; 4). This indicated a missing pattern of actions and thereby no interpretive commitment. However, the CCO indicated personal commitment to the 17 SDGs, as he represents KLS PurePrint in the UN Global Compact Network of Denmark. Thereby, he became the main driver of the SDG implementation. Further, he emphasised: "I am on the advisory board of the SDG Accelerator Program in the UN", which indicated his personal commitment and knowledge to being on the advisory board (Appendix 7, p 3).

Thereby, the interpretive commitment towards the SDGs did exist for some managers, however not throughout the whole company. This resulted in that the lower position within the corporate hierarchy the interviewee had, the less knowledge and therefore less commitment were recognizable during the interviews.

7.3.3.3 Narrative

The following analysis of the narrative within Phase 3 will follow the same structure outlined in interacts and the patterns of interacts. The narrative of Phase 3 is based upon the previous years through the dimension of temporality, which is recognized by the coherent and ongoing shift from the previous phases (Hernes et al., 2015).

Strategy Phase 3

The narrative within Phase 3 evolved around the strategy of the cradle-to-cradle certification. The change was initiated by the Board Member 2 joining and most interviewees mentioned her, when they were asked about the reason for implementing the cradle-to-cradle certification (Appendix 1; 2; 3; 6). Board Member 2 created a micro stability within the change process as her knowledge and experience created time and space for KLS PurePrint to adapt their narrative to the new circular process (Hernes et al., 2015).

Furthermore, to the products biodegradable, followed their previous narrative of preserving the environment for future generations as a caring company. The CEO highlights this:

> "We could not make it differently! […] We cannot keep on filling our products with chemicals and people get sick: we get allergies and we get cancer, we get sick, we are destroying ourselves. We need to stop – it is crazy what we do!" (Appendix 5, p. 7)

The statement indicates that the temporal view of the change process was inevitable as KLS PurePrint built their new strategies upon their previous narratives and actions (Kaplan and Orlikowski, 2013, mentioned in Hernes et al., 2015). In 2016, the company introduced the pyramid (Figure 10), mentioned previously in 7.3.3.1, in order to create new patterns of interacts within KLS PurePrint. Such a non-human actor was also made use of to indicate the multiple changes that had been introduced in KLS PurePrint over Phase 2 and Phase 3 into one interrelated frame. The CEO elaborated on this:

> "I think it was to try to answer: 'How does the electric cars fit into cradle-to-cradle?' [...] we had a lot of questions about how does it fit together? Is there some kind of, overlap between some of it, and how do we see the hierarchy between them?" (Appendix 7, p. 5).

In order to make use of the forgoing changes and connected narratives, the non-human actor of the pyramid was placed within the facility next to the timeline. The Production Employee emphasized

the use of the pyramid (Appendix 4), which entails how it facilitates the strategic integration of cradle-to-cradle within a narrative. Placing the pyramid that illustrates KLS PurePrints's various strategies, next to the company timeline, visualized by a tree's annual rings, connects the changes to the company history (Figure 10). The annual rings further referred to the companies most important resource paper based upon wood. Hence, this creates a coherent connection between KLS PurePrint's strategies and the environment.

According to Kaplan and Orlikowski (2014) managers need to engage in the ongoing temporality when creating compelling strategic narratives, which are coherent, plausible and acceptable to most key stakeholders. The use of non-human actors such as the wallpaper (Figure 9), the green cakes and the pyramid (Figure 10) within the strategic Phase 2 as well as in the strategic Phase 3, underpin the new strategic narrative of KLS PurePrint. Furthermore, non-human actors such as the wallpaper (Figure 15) in the production room, supported the act of framing the narrative of a pure nature that KLS PurePrint is working towards (Hernes et al., 2015). As mentioned previously, the importance of using non-human actors follows the dimension of heterogeneity of factors, as it activates the change process. Moreover, the dimension of forces at work, as they are necessary in order to create the momentum for the narrative to unfold (Hernes et al., 2015).

Figure 15: Wallpaper within the Production Facilities

The shift from the narrative to becoming “the greenest print house in the world” (Appendix 1, p. 6) within Phase 3 followed sequentially as a top-up to the previous vision of becoming “the greenest print house in Scandinavia” (Appendix 1, p. 3). By building on temporality mentioned by Kaplan and Orlikowski (2014), KLS PurePrint utilised the created momentum in the previous change Phase 2 to create their vision of mitigating climate change. Saving the environment and mitigating climate change, with their new global strategy was therefore visualized by the non-human actor of the rainforest wallpaper (Figure 15). Further, the Production Employee described the transition towards the cradle-to-cradle strategy as: “I am very pleased with it. That is actually something that I am a part of that and maybe your children will have a better world. Because if we continue as we have done, then we will not survive.” (Appendix 4, p. 7). This statement underlines of how he felt a purpose within his profession of producing print products, while working towards a global change.

As mentioned previously in 7.3.2.1, the cradle-to-cradle strategy did not only allow the company to integrate the development of new products within their strategy, but also provided specific targets. As a result, KLS PurePrint changed their narrative to solve global issues. The innovation of the Treatbox, as mentioned in 7.3.2.3., is one example of how KLS PurePrint want to solve the single-use plastic issue (Appendix 1, 3; 4; 5; 6). The Production Employee expresses at the end of his interview: “What we are doing here now is the completely right thing! If there were more companies doing the same thing as we, then the world would be a better place.” (Appendix 4, p. 6). This implied, how the strategic change process has made him interpreted the position of KLS PurePrint’s strategy as a tool to make sense of the global climate change.

Supplier Impact Mapping

The supplier impact mapping supported the creation of a narrative. The supplier impact mapping process in Phase 3 was similar to the one in Phase 2, where it was created for the CO2-strategy. This emphasizes how the supplier impact mapping includes a temporal view of a past event that has constructed the present. Kaplan and Orlikowski (2014) emphasize how this build the basis for reimagining the future of companies. Thereby, the second use of the supplier impact mapping shall not only be seen as a tool to outline their materials but also a tool for KLS PurePrint to make sense of the cradle-to-cradle strategy. This understanding further created the possibility for KLS PurePrint to update their narrative from emphasizing Denmark towards becoming “the greenest print house in the world” (Appendix 1, p. 6).

Collaborations

Further, the new narrative within Phase 3 evolved around the collaboration with the other cradle-to-cradle print houses. The mentioned collaboration with Gugler and Vögeli in 7.3.2, created not only the external support of internalizing external knowledge, but also trust and commitment to a shared product, as the PurePrint label. All the three companies created a marketing video, that explains the circular degradability of paper within a cradle-to-cradle flow (Gugler 1, n.d.; KLS PurePrint 2, n.d.; Vögeli 1, n.d.). The comparison (Figure 16) below indicates the identical video with the slight exchange of three collaborators corporate logos, which implies their co-creation of a narrative to create micro stability while committing to their collaboration (Hernes et al., 2014).

Figure 16: Narrative Comparison of YouTube Videos (Gugler 1, n.d.; KLS PurePrint 2, n.d.; Vögeli 1, n.d.)

All the three videos utilize the same manuscript, only in different languages. The manuscript illustrates the cradle-to-cradle process by the example of a cherry tree:

> "Once the cherry blossom season is over the petals fall to the ground, where they do not form rubbish heaps, but flow back as nutrient into the cycle of nature, all resources remain intact, and can be used again and again." (Appendix 8, p. 1)

This co-created narrative allowed the employees of the three collaborating companies to make sense of their change processes. This aligns with Søderberg's (2006, mentioned in Hernes et al., 2015) notion of collective narratives as a tool that enables people to create sense through events and actors during the process of change. The video itself therefore combines the commitment towards the

PurePrint label as well as visually elaborating on the reasons for cradle-to-cradle printing as the solutions to mitigate climate change (Gugler 1, n.d.; KLS PurePrint 2, n.d.; Vögeli 1, n.d.).

The collaboration further highlights the PurePrint production process as a radical change for the print industry: "Let's make an end to the destruction of resources. Let's begin the next printing revolution together." (Appendix 8, p. 2). This statement stresses the creation of a new narrative of KLS PurePrint as a part of a movement of becoming change actors within the print industry. Thereby, the video both facilitates the co-creation between the collaborators, as well as it elaborates, in a simplified way, how the cradle-to-cradle process within the print industry functions. Therefore, the collaboration, as visualized by the videos, helps stakeholders to make sense of the narrative of KLS PurePrint.

SDG Integration

As mentioned previously, there was a great discrepancy regarding actions around the 17 SDGs in KLS PurePrint. While the CCO had brought the tool into a strategic setting, the processes created surrounding it, did not support the internal narrative through the entire company of KLS PurePrint. There is seemingly a gap between what KLS PurePrint's customers perceive when entering the production facility (Figure 13), to what knowledge that the employees actually have regarding them. As previously mentioned, the lack of commitment, both interpretive and social, therefore does not allow a narrative around the SDGs to evolve. By applying Hernes et al. (2015), this implies that no micro stability has been achieved around the SDGs, as the actions have not been connected to meaning throughout the entire company.

7.3.4 Phase 3 Conclusion

The following conclusion answers the three sub-questions according to Phase 3.

Firstly, part 7.3.1 of the analysis showed how the management of KLS PurePrint embraced the ecocentric world view by the cradle-to-cradle strategy. This is since the cradle-to-cradle certification allowed KLS PurePrint to apply a circular process. This illustrated how the management of KLS PurePrint saw their ecosystem in alignment with nature's ecosystem. However, this part of the Analysis also showed that it could be discussed to what degree KLS PurePrint actually is ecocentric as the company still offers products to their customers that are not cradle-to-cradle certified.

Secondly, part 7.3.2 of the analysis showed how the embracement of an ecocentric world view resulted in the implementation of a transformational strategy. This was argued due to the fact that the cradle-to-cradle strategy fully emphasizes a circular process, as the PurePrint products of KLS PurePrint are biodegradable. This also resulted in that KLS PurePrint in Phase 3 moved from embracing eco-efficiency to eco-effectiveness. Moreover, the ecocentric world view was enhanced by an ecocentric vision when KLS PurePrint updated their vision to including the world instead of only Scandinavia and initiated the collaboration with Gugler and Vögeli.

Furthermore, this part of the analysis showed how the dynamic capability of maintaining was carried out when collaborating with Gugler and Vögeli to maintain their competitive advantage by sharing development costs. Further, the ecocentric dynamic capability of remapping was exercised when going through the 5-step process of mapping out materials used in the production processes. This capability of remapping was facilitated via the Roadmap given by the cradle-to-cradle certification consultants, in order to keep track on the development stages. The ecocentric dynamic capability of reaping was activated via the received recognition KLS PurePrint has gotten due to awards and the PurePrint label. Moreover, to facilitate the ongoing activity of the dynamic capabilities, KLS PurePrint applied the SDGs to their business model. This resulted in a tool for external and internal communication but also a product opportunity for KLS PurePrint. However, the analysis showed that the individuals of KLS PurePrint viewed the utilization of the SDGs differently.

Thirdly, part 7.2.3 of the analysis implied how the change process towards circularity was supported by sensemaking. The implementation of the cradle-to-cradle strategy itself represented the sensemaking, consisting of the different patterns of interacts that resulted from the five quality criteria within the cradle-to-cradle certification. Such new patterns of interacts were integrated in both the repeated supplier impact mapping and the repeated implementation events. The cradle-to-cradle certification required further actions, that bond the actors' activities to the strategy, such as new investments and its external recognition. As a result, the creation of both interpretive commitment to the underlying idea of producing chemical-free products as well as the creation of social commitment to KLS PurePrint achievements was accomplished. This built upon the previous integration of CO2-reduction, as some steps had already been succeeded in the years prior to 2013.

Further, the collaboration with Gugler and Vögeli represented a momentum with external partners, were trust and commitment to their shared narrative 'PurePrint' was created. Consistently, the co-development of a production process labelled as 'pure', created social commitment among the actors

of KLS PurePrint towards the change. Moreover, the analysis showed that the SDG integration lacked interacts and thereby patterns of interacts. Since some interactions were initiated by the CCO, commitment was only partly established within the management of KLS PurePrint. Therefore, the commitment had not evolved around the SDGs, which hindered a narrative to be created. Hence, sensemaking regarding the SDGs only took part to a limited extent.

8. Discussion

In the following, the findings of the analysis will be outlined. Hereafter, theoretical implications will propose additional perspectives to the utilized theories and suggest areas for further research. Next, managerial implications will be outlined based on the findings, which highlight complexities met by managers undergoing a strategic change towards circularity. At last, strategic recommendations will be given to the management of KLS PurePrint.

8.1 Findings

The main finding of this case study is that the management of KLS PurePrint created an ongoing strategic change process towards circularity by cumulatively adapting their strategy. This cumulative process began as the management of KLS PurePrint first applied the CO2-strategy. This implied an internal change process, as the employees of KLS PurePrint became urged to engage themselves with sustainability by suggesting different means to reduce the overall CO2-emissions. These means where created by both top management and the employees, which thereby created commitment and the creation of a common narrative. This narrative was based on becoming the greenest print house in Scandinavia.

Later in 2013, in order to embrace circularity, KLS PurePrint implemented the cradle-to-cradle strategy. This was perceived as an incremental advancement, rather than a major change in strategy, as the employees were familiar with the ongoing CO2-strategy. This perception allowed the employees of KLS PurePrint to adapt both their processes and their commitment to the new strategy. By cumulatively adapting their strategies, the management of KLS PurePrint enabled the employees to acclimatize themselves to the new initiatives that the strategies implied. This main finding is illustrated in Figure 17 below.

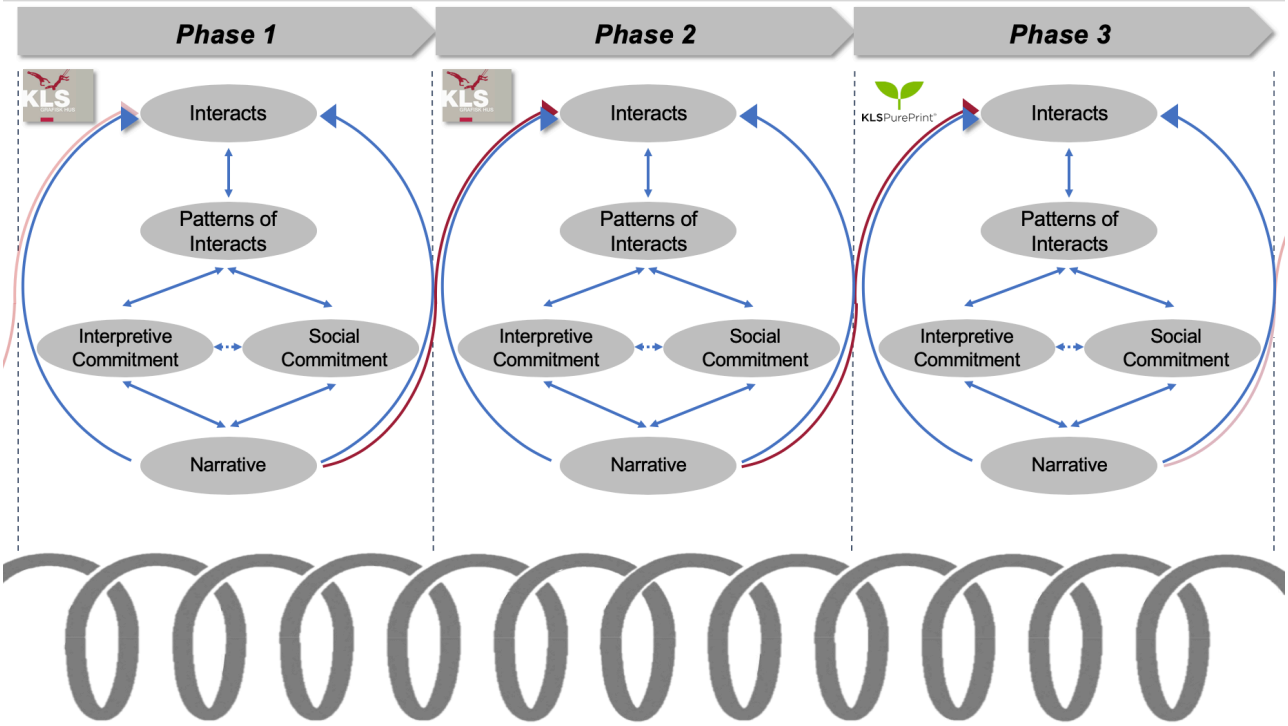

Figure 17: Cumulative Sensemaking During Strategic Change (Based on Hernes et al., 2015)

The figure above illustrates how time stretches on a continuum from the past towards the future. Further, it shows how change is an ongoing process without stabilized steps and how sensemaking is continuously developing, leading from one phase to the next. However, the traditional strategy (Phase 1), transitional strategy (Phase 2) and transformational strategy (Phase 3) emphasize how the management of KLS PurePrint broke down the change process. This allowed KLS PurePrint to utilize the narrative from Phase 1 when entering Phase 2, which enabled for interacts and patterns of interacts to generate commitment within KLS PurePrint towards the CO2-strategy. This resulted in a narrative that was brought to influence further interacts in Phase 2. These interact created new patterns of interacts, which generated further commitment and a new narrative going in to Phase 3. Thereby, the cumulative adaptions of the strategy allowed the management of KLS PurePrint to implement the strategies towards circularity via sensemaking.

The second finding concerns the narratives identified in KLS PurePrint. The analysis showed how the concept of narrative within the sensemaking process was influenced by different external settings. In the beginning of the Phase 2, the narrative was influenced by an external narrative regarding sustainability, as for example the movie "*An Inconvenient Truth*", or the UN's Climate Reports. Further ahead in Phase 2, the interviewees referred to how changes in internal behaviour of employees

at KLS PurePrint became visible. This was shown via new patterns of interacts, which further demonstrated a commitment to the implemented CO2-strategy. The analysis further showed how KLS PurePrint created an internal narrative as a result of this commitment, which was to become the greenest print house in Scandinavia. This finding is illustrated in Figure 18 below.

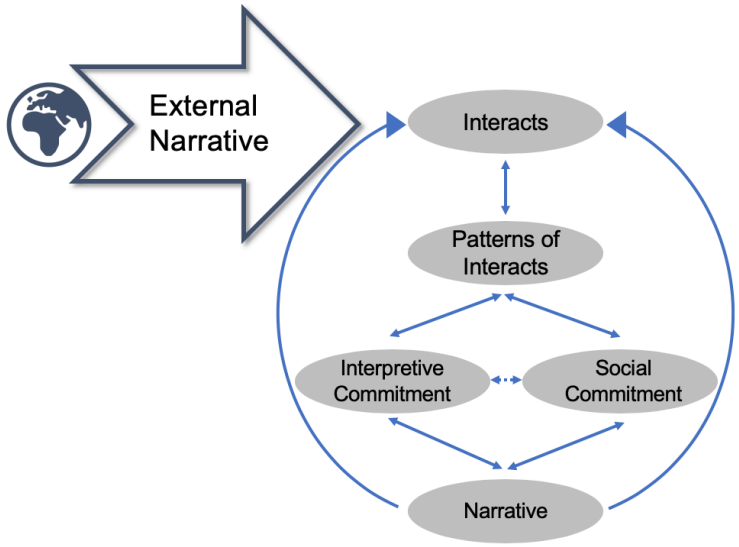

Figure 18: External Narratives Influencing Sensemaking (Based on Hernes et al., 2015)

The figure illustrates how an external narrative influences the interacts and thereby the patterns of interacts in KLS PurePrint in Phase 2. This ongoing narrative shall not be seen as strictly connected to the Phase 2 as outlined above, but rather as a flow that kept influencing KLS PurePrint's strategic change processes. This is a result of how the interviewees in the beginning of Phase 2, referred to themselves as a print house that wanted to engage in a more sustainable way of doing business. This narrative developed into KLS PurePrint referring to themselves as problem solvers where they were engaging in global climate issues in Phase 3. This was shown by how KLS PurePrint for example moved from the Graphic Federation Grakom to Danish Industry Federation as they aligned more with KLS PurePrint's current view on business. The change in narrative was further exemplified by how KLS PurePrint began to engage with the global issue of plastic, as they are involved in creating food packaging made my paper. This finding will be further developed in the Theoretical Implications, 8.2.

The third finding concerns the concept of cradle-to-cradle. It was found that KLS PurePrint was not focused on engaging customers and other actors down the value chain in continuing the circular approach. The reason for this is that KLS PurePrint did not make sure that the PurePrint products were put back into the value circle, or more precisely, the biological cycle. This finding emphasizes how circular processes need to be supported by holistic systems in order to maintain the value of products and their materials at the greatest value, which enables to generate long-term environmental benefits. The fact that KLS PurePrint lacked an external focus created a flaw in their circular system. This flaw implies that if KLS PurePrint's biodegradable products are being disposed as regular waste, they will end up being incinerated, which creates CO2-emissions. However, if KLS PurePrint's products were composted they would not create the same CO2-emissions. Thus, by not taking the other actors down the value chain in into consideration and creating a full circular system, KLS PurePrint is not fully embracing ecological sustainability.

The fourth finding regards the lack of commitment towards the integration of the SDGs. The analysis showed how the actors in KLS PurePrint both referred to and use the SDGs differently, which signalled an internal misalignment around them. This misalignment originated in how the management mostly referred to the SDGs in their external work towards customers and other industry actors. An internal process for using the SDGs was not implemented to the same extent as the processes regarding the CO2-reduction and the cradle-to-cradle certification, which created a lack of internal commitment. The management was further misaligned around their commitment towards the SDGs. On the one hand, the Chairman questioned if KLS PurePrint utilized the SDGs in the optimal way as the goals could support KLS PurePrint to create an internationalized strategy. This would allow for an international market expansion of KLS PurePrint. On the other hand, the CCO was found as the main driver in KLS PurePrint that actively worked with the SDGs on a regular basis via, for example, the UN Global Compact Academy. Here the CCO got the possibility to develop his knowledge around the SDGs. However, this gained knowledge has not been spread throughout the rest of KLS PurePrint.

The applicability of case studies has previously been argued for in 6.2.2 via the concept of external validity (Eisenhardt, 1989; Flyvbjerg, 2004; Yin, 2003). Thereby, it is important to investigate if another context is suitable for utilizing the findings from this case study before applying them. In order to explore whether the same findings can be found in the other context, the theoretical framework laying the basis for this case study shall first be applied. Furthermore, the management of KLS PurePrint has mentioned how they are interested in supporting other print houses to become

cradle-to-cradle certified and become a part of the PurePrint label. Therefore, the knowledge created from this case study can be utilized to guide those companies if the quality criterion of external validity has been confirmed.

8.2 Theoretical Implications

The theoretical framework developed for this case study has created an analytical frame, which generated the findings outlined above. However, the analytical frame has at times generated reflections regarding the individual theories. Therefore, these reflections will be outlined in the following. Moreover, two suggestions for future research that would enrich this case study will be laid out.

8.2.1 Theoretical Reflections

One theoretical reflection was made when utilizing the theory of Borland et al. (2016). The fact that their theory outlines only two world views on sustainability causes this theory at times to appear static. With static, it is meant that the two world views are described as two ends on a scale without mentioning other optional standpoints in between. However, Borland et al. (2016) do mention other views from their research, such as humanism and biocentrism, but do not include them in their framework. This reflection was made during the data collection as KLS PurePrint had the transitional CO2-strategy that emphasized both an anthropocentric and ecocentric view on ecological sustainability. Even though Borland et al. (2016) emphasize that a company can place themselves between these two ends, it can still seem overwhelming for a management to transform a company from having an anthropocentric worldview to an ecocentric one, as these world views have great distance apart. Therefore, more defined standpoints on that scale could improve the theory's utilization as it would make it more approachable to some managers.

A further theoretical reflection was also made during the research process in regards to Hernes et al. (2015). They describe two types of a narrative, namely the initial and the shared. They argue that the initial narrative is the narrative that is being portrayed on a company and that the shared narrative represents the narrative that is being taken in by the company. However, during the research process, the influences of external narratives were found, as described in the Findings 8.1. This showed a more nuanced transformation of narratives that implied a process of narratives moving from being external

to becoming internal via the process of sensemaking. This further generates an understanding for how narratives are also a part of a dynamic change process, which includes different actors, both human and non-human. This implies that external narratives and their impact on internal narratives could be of great importance for sensemaking in companies. This is a reflection made upon Hernes et al. (2015) as they are not are not mentioning this process of the narrative.

The previously outlined reflections only display a theoretical wonder that arose during the research process and are only based on the utilized theoretical framework within the specific area.

8.2.2 Future Research

The first recommendation for future research is based on the fourth finding regarding the lacking commitment to the SDGs. The initial research area of this case study was to approach the topic of how to integrate the SDGs into companies via circular business strategies. However, due to the discovery of the lack of utilization and commitment to the SDGs in KLS PurePrint, this could not serve as a sufficient focus. Moreover, the SDGs in connection to circular business models is still a novel area of research, as the SDGs were implemented only in 2015. This implies shortcomings of results from companies who have implemented them and thereby further shortcomings of researchers being able to study their affects. Nevertheless, this topic could be of great importance in the future as it entails that the SDGs would be more integrated in other companies and in KLS PurePrint. This type of study could thereby explore how the 17 SDGs are incorporated into circular business models, what value they possibly bring and how to capture it. It could further be explored if there are any specific SDGs that are more straightforward for circular business models and how they relate to each other. At last, due to the fact that the SDGs are a global framework, it could be of interest to explore how they could support companies to become more internationalized as mentioned in connection to KLS PurePrint. This would allow for the focus of a case study to evolve from KLS PurePrint's presence on the Danish market to embrace the international market that they partly are embracing today through their collaborations with Vögeli and Gugler.

The second recommendation for future research is based on the third finding and the fact that this case study takes an internal perspective of KLS PurePrint. As mentioned, they are not focusing on engaging costumers and other actors down the value chain to follow their circular process. This results in that the materials from their PurePrint product are possibly not composted and thereby kept at the highest attainable value in a closed system, which is against the objective of eco-effectiveness.

Therefore, the recommendation for further research is to include this external perspective of KLS PurePrint and thereby include a holistic view of their processes and the life cycles of their products. By taking this external view it could be explored how KLS PurePrint could fully integrate their external actors into their business strategy. This would lead to an investigation about how KLS PurePrint could be a part of creating a systemic change that could generate full eco-effectiveness. This would involve an investigation on how KLS PurePrint could generate collaborations further downstream of their value chain, with costumers. Research within this field could take advantage of Webster's (2017) and Braungart et al.'s (2007) view of how products shall move towards becoming flows of services. This would highlight how customers get their needs fulfilled by a service but how the companies still can stay responsible by keeping ownership of the product and its materials. Further, this type of research could benefit from Geels (2002) theory on technological transitions. It could thereby be investigated how circular processes, as cradle-to-cradle could become the regime. It would thereby be of value to explore which technological changes are needed in society, and also other functions as for example regulations, culture and industrial networks. This would create a greater understanding for how circular processes could achieve increased importance in today's society and what mechanisms that are needed for this to take place.

8.3 Managerial Implications

The following managerial implications are based on the overarching complexities that were found when studying the combination of strategic change towards circularity and sensemaking. The three managerial implications derived from the analysis are: The ongoing view on sustainability, the complexity of cradle-to-cradle integration and the challenges around the SDG implementation. These implications are proposed to managers who are facing an implementation of a strategic change process towards circularity.

8.3.1 Sustainability as an Ongoing Phenomenon

The first implication that managers need to take into account is the ongoing definition of sustainability. This is based on how the method of being a sustainable company has developed throughout the years and is still doing. This was highlighted based on how the management of KLS PurePrint has found different ways of embracing sustainability in the past by implementing the CO2-

strategy, the cradle-to-cradle-strategy and lastly the SDGs. Thereby, an implication for managers is to keep embracing the process of defining, being and staying sustainable as ongoing and as way to continuously improve their actions. By allowing the phenomenon of sustainability to stay ongoing, it is of importance for managers to utilize their capabilities and to allow them to be dynamic. Furthermore, sensemaking is of great importance for managers to deal with the complex phenomenon of sustainability in order to grasp how its definition is being portrayed towards employees in the company. This complexity shall be approached via creating a micro stability where the employees can commit themselves to the strategic change process. This will further allow a new narrative to emerge in order to lead the way of in this continuous process.

8.3.2 The Complexity of Cradle-to-Cradle

The second implication for managers is the need for them to be aware of the complexities of a cradle-to-cradle strategy. These complexities are represented by how a company, to some extent, loses control of how their product is being utilized and disposed of after it is being sold. Thereby, managers need to acknowledge this complexity by creating systems that can to some extent control sold products and how they are being disposed of at the end of their lives. The reason for this is that a circular approach, as a cradle-to-cradle strategy, depends on the interconnectedness of the involved actors within a company's value chain, both upstream as well as downstream. Therefore, the need for managers to create these holistic systems that emphasize such a systemic view of the company and their external actors are crucial in order to fully implement such a strategy. Creating strategic collaborations with the company's external actors, which would strengthen the holistic system of the cradle-to-cradle strategy, could close the loop.

8.3.3 The Characteristics of the SDGs

The third implication for managers to take into considerations is the characteristics of the SDGs. Their complex nature is primary based on their novelty as they were introduced as late as 2015 by the UN. This implies that the SDGS are a novel framework for companies to adapt to, which further increases complexity for managers. Further, as mentioned in the Theoretical Implications 8.2, research on the utilization of the SDGs is lacking, which further generates insecurities. Moreover, managers need to acknowledge that the SDGs are a managerial framework. This implies the importance of managers and their role in ensuring the adoption of the SDGs in the remaining

company. This creates the important insight of how managers need to take responsibility of implementing them in an understandable manner for the company. Moreover, the SDGs create further complexity for managers as they are not created as strategies but as guidelines. Therefore, managers must translate these guidelines in order to implement them into the corporate strategy. This translation process can also imply complexity for managers as the sub-targets of the SDGs also include governmental responsibilities, which is difficult for managers to approach.

8.4 Strategic Recommendations

The strategic recommendations are based on the analysis of sensemaking during the strategic change process towards circularity in KLS PurePrint from 2007 and onwards. The structure of the recommendations will follow the managerial implications above, by connecting the outlined complexity in relation to the specific case of KLS PurePrint. Thereby, the three recommendations concern to continuously update their sustainability strategy, downstream communication and strategic integration of the SDGs. These are directed towards the management of KLS PurePrint.

8.4.1 Continuous Update of the Sustainability Strategy

The first recommendation is to maintain the process within KLS PurePrint of creating new sustainability strategies continuously as this has shown to be valuable in the past. This will allow the management of KLS PurePrint to continue to strive towards ecological sustainability. This shall be done through continuing with the strategy weekends that have previously generated important strategic ideas. Furthermore, KLS PurePrint shall continue the process of regularly updating the members of the Board of Directors as it has contributed with new external knowledge and skills for KLS PurePrint to utilize both internally and externally.

By continuously creating new sustainability strategies, the management of KLS PurePrint could leverage their sustainability impact. This shall be done by developing a strategy that is embracing an international level, which is aligned with the current vision of becoming the world's greenest print house. This new international sustainability strategy should further support the management of KLS PurePrint to spread the PurePrint label. The current PurePrint collaboration with Gugler and Vögeli is built around the objective for other print houses to join the label in order to share knowledge and experience. Thereby, an international sustainability strategy would help to promote the PurePrint

label and the sustainability agenda throughout the print industry. This would increase the possibility of other print houses to be willing to collaborate and to become change agents in the print industry.

8.4.2 Downstream Communication to Manage Cradle-to-Cradle Complexity

The second recommendation is for the management of KLS PurePrint to initiate downstream communication towards their customers, following business-to-business. This would enable these actors to further emphasize a circular process in order to keep the materials at the highest possible quality. As mentioned, the cradle-to-cradle strategy requires all actors within a company's value chain to be included, especially downstream. Therefore, this implication is of great importance in order to enable a full systematic approach and to eliminate its current flaws. As this is not the current status, KLS PurePrint is not fully embracing a cradle-to-cradle strategy. This communication could be facilitated via workshops, where customers of KLS PurePrint are educated in both methods and the importance of product disposal. These workshops could be led by Board Member 2, who has strong knowledge in both biology and business.

8.4.3 A Strategic Integration of the SDGs

The third recommendation for the management of KLS PurePrint is to further integrate the SDGs into their corporate strategy. By integrating the SDGs properly, the management of KLS PurePrint will be able to further utilize them internally and increase the sensemaking around them that at this point in time is lacking. Furthermore, the strategic inclusion of the SDGs can be used as a catalysator for creating an external brand image for KLS PurePrint, which could then be used as a competitive advantage. In order for the management of KLS PurePrint to ingrate the SDGs into their corporate strategy, they are recommended to utilize designated tools, as for example the SDG Compass. The SDG Compass is a straightforward tool that is developed for companies to understand and prioritize which SDGs to approach. Further, it helps companies to integrate the SDGs and how to both report and communicate them. This type of tool creates a full integration of the SDGs and not only partial integration, which is the status of today.

9. Conclusion

Based on a qualitative research method, the case study at hand has allowed to explore the print company KLS PurePrint during a strategic change process towards circularity and how sensemaking was utilized throughout that process. This research approach enabled to investigate the intersection of strategic change management towards sustainability and internal sensemaking (Borland et al., 2016; Hernes et al., 2015). The transformation towards circularity was investigated by an in-depth assessment of three strategic phases within KLS PurePrint, which corresponded to the shift from a traditional, to a transitional and at last to a transformational strategy (Borland et al., 2016). The exploration of the sensemaking process within KLS PurePrint was therefore performed coherently (Hernes et al., 2015).

The analysis resulted in four findings. The main finding displayed the cumulative strategy development towards a circular strategy within KLS PurePrint. This was illustrated by how the three strategic phases were cumulatively constructed and thereby built on each other's past. This brought the created narrative to the next phase. The second finding displayed the impact that external narratives had on KLS PurePrint, such as climate change. This external narrative affected employees' behaviour, as well the creation of new patterns of interacts. This process resulted in sensemaking around the strategic change process. The third finding illustrated the implementation of the cradle-to-cradle strategy, revealing that KLS PurePrint had only created limited implications for customers to follow their circular process. Although the system approach of circularity is built upon the closing of the loop, this was not evident within the data. The last finding displayed the lack of internal commitment towards the implementation of the SDGs. The low commitment was the result of an inadequate implementation process.

Two theoretical implications were found during the research process. The first represented the two world views outlined by Borland et al. (2016). This was implied as their ecocentric and anthropocentric world views indicate two widespread perspectives for companies undergoing a shift towards a sustainable strategy. This transition can be overwhelming for managers at times, which could be eased by creating additional world views. The second theoretical implication emphasized how a focus on the impact of external narratives could enrich Hernes et al.'s (2015) sensemaking framework. This was implied as an ongoing process of narratives was found in KLS PurePrint.

Two suggestions for future research were made. The first implied a focus on the integration of the SDGs in KLS PurePrint. The SDG framework was initiated in 2015, hence only limited research on its integration has been published. Due to the lack of utilization of the SDGs within KLS PurePrint, future research was recommended to explore the incorporation of the SDGs within circular business models. Furthermore, future research could investigate possible downstream communications activities in order to enable KLS PurePrint to close the loop through engagement with customers.

The managerial implications showed how managers shall allow the phenomenon of sustainability to viewed as ongoing in order to adapt their strategies accordingly. This shall be done by managers embracing the dynamic capabilities. Furthermore, the school of cradle-to-cradle displayed a complex system, that requires a holistic understanding of the value chain, both upstream and downstream. At last, the third implication for managers to take into consideration are the characteristics of the SDGs due to their novelty and their wide scope.

At last, this case study outlined three strategic implications for the management of KLS PurePrint. Firstly, the management of KLS PurePrint was recommended to carry on the continuous strategic adaption, which allows them to follow their strategic pattern that was initiated in 2007. This will create the opportunity for KLS PurePrint's management to create an international strategy, based on their collaborations via the PurePrint label. Secondly, the management was recommended to integrate communication activities towards actors downstream the value chain. This will allow these actors to embrace the circular process created by KLS PurePrint. Thirdly, the management of KLS PurePrint was recommended to further integrate the SDGs into their strategy. This will enable them to utilize SDGs internally, and thereby decreasing the lacking commitment towards them.

In the end, the struggle of strategic transformations towards circularity reveals the power of sensemaking, which can be of interest for other academics to investigate. Thus, hopefully the findings of this study can inspire others to explore further ways to manage this complexity.

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