Bachelorôs Thesis

CIRCULAR ECONOMY:

Implications for the Swiss Fashion Retail Industry

ZHAW Zurich University of Applied Sciences
School of Management and Law

Johannes Scheibler, S12468203
Business Administration, General Management PiE
scheijoh@students.zhaw.ch
Muristrasse 86, 3006 Bern

Submitted to:
Dr. Katharina Hetze
Research Associate at the Center for Corporate Responsibility

Winterthur, 24 May 2017

MANAGEMENT SUMMARY

The concept of Circular Economy is much discussed among experts and in sustainably advanced business contexts such as the 2017 Sustainability Summit in London. Several multinational companies have already joined networks to accelerate the transition into future-proofed business practices. Startups, long-established companies and scientific research are devising groundbreaking solutions to work towards this new business imperative. At its core, the Circular Economy aims at replacing the traditional, linear way of extraction, production, consumption and disposal with a circular model, where waste is considered as a precious resource for new applications.

However, it seems that in the Swiss business environment the concept is rather unknown or ignored, even though it is highly relevant considering the current and forecasted macro-economic and environmental developments. ñAdapt or dieò is one of the more recent statements in the light of environmental pollution, the tightening of resource availability together with population growth and increasing consumption on a global level. Therefore, this Bachelorôs thesis aims to analyze the present status of and to provide guidance for the Swiss fashion retail industry.

By means of a multiple-case, embedded case study design, two Swiss fashion retailers are studied within their respective ecosystems. The two units of study were selected to approach a certain degree of external analytic validity, which is the reason why a large multinational and a smaller player with Swiss tradition were chosen. Qualitative and quantitative sources of primary and secondary data are adduced, whereas solely qualitative methods are applied. The assessments are then made inductively on the basis of the business model Recovery & Recycling. It is as such one of five Accenture-devised possibilities for enterprises to embark on a circular future.

It was found that successfully employing the Recovery & Recycling business model embraces decoupling in two different ways: decoupling from potentially harmful resources, the environmental perspective and, decoupling from increasingly scarce resources, the economic perspective. The Swiss fashion industry turned out to be rather advanced within the environmental perspective, yet there is room for improvement when it comes to closing the material loop from an economic perspective. Smaller players with limited means are well advised to draw on the many instruments or methods already available and to imitate larger, more advanced players. Finally, some advancements depend on breakthroughs in recycling technology and material sciences. Nevertheless, much can already be improved by efficient design of products and processes in a way that facilitates reuse and recycling.

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1 Introduction

Except sunlight, wind or maybe oceanic currents, this is a world with constrained resources. Considering that, world population is still on the rise (United Nations [UN], 2015), the conservation of limited resources and improving their efficiency must be a key concern for society as a whole. The concept of Circular Economy seeks to harmonize the fact of limited resources, with the prospective strains put on them due to changing consumption patterns and world population growth. Circular Economy comprises innovative ways and a new mindset about how a future economy could best handle this excess demand. The global middle class, for example, is projected to rise by 50 percent from 2020 to 2030 and to increase its spending by almost 60 percent (OECD Development Center and Kharas, 2010, 28). The challenge lies, therefore, in satisfying this increasing demand without running out of resources, which are limited. However, moving from linear business models towards circular ones is not only a question of existence or sustainability from both a business perspective and humanity as a whole. Circular Economy is also of enormous growth potential: According to a statement of Peter Lacy, an Accenture strategist, ñthe Circular Economy is a 4.5 trillion dollar global opportunityò (Lacy et al., 2016, 3ô15ôô). Lacy, Rutqvist & Accenture go even further in their recent publication. It is not only a growth opportunity but also a necessity if output is to be increased. In their research, the development of many economies during the past decades was analyzed with the insight that virtually no economy managed to decouple its gross domestic product from the use of natural resources (2015, 3-4). Thus, the more resources economies were able to extract and make use of, the more the economies grew. Consequently, without a change in how economies function and how they are evaluated, growth as known today ends simultaneously with the depletion of the worldôs resources.

In this field of tension, the concept Circular Economy becomes increasingly popular, as a query on Google Trends reveals for the ñtopicò Circular Economy. Choi & Varian describe Google Trends as ñ[é] a real-time [é] index of the volume of queries that users enter into Google.ò Furthermore, they state that while it is inadequate to predict the future with, it is a helpful tool for predicting the present (2012, 2). Figure 2 depicts the evolution of the ñtopicò from 2004 until today with an obvious boost starting around 2013. Especially the Netherlands and Belgium show a high interest in the topic whereas Switzerland is *not* shaded blue or mentioned in the list at all.

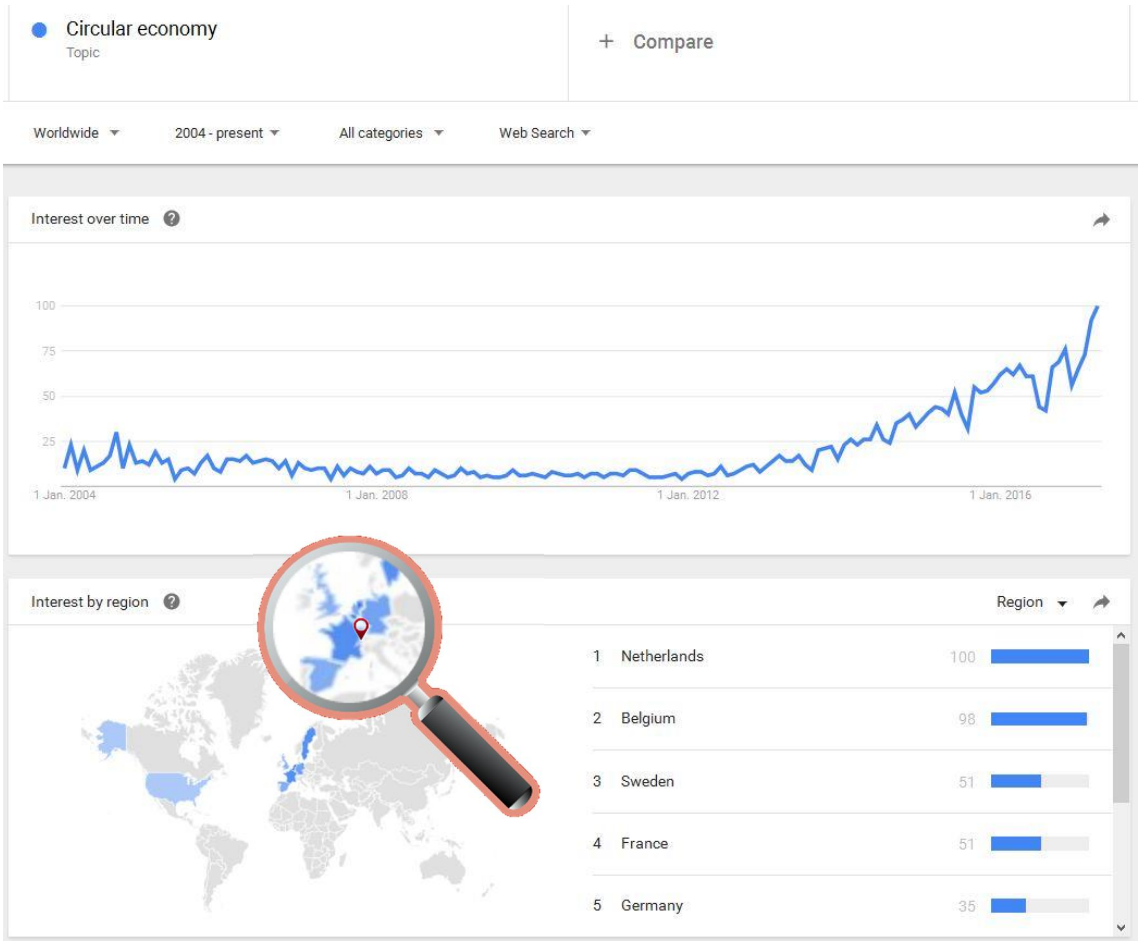

Figure 2: Trend topic Circular Economy (Retrieved from https://trends.google.com/trends/, April 7, 2017)

This observation can lead to the assumption that Swiss businesses are indifferent to the above-described developments, or that they are not trying to approach them with the concept of Circular Economy. However, the Conference Board ña global, independent business membership and research associationò lists Circular Economy as a key business issue for 2017 along with digital transformation, the future of innovation and more (n.d.). One could conclude that Swiss businesses, deliberately or not, are neglecting the business imperative to embark on a circular sourcing strategy. It is therefore assumed that a need for practical research exists for Swiss industries in general. The present Bachelorôs thesis builds upon this gap with the aim to raise awareness of Circular Economy and its consideration in the Swiss business environment, not least because, in an entrepreneurial sense, this concept will be of considerable importance for doing business sustainably and staying competitive and profitable in the long-term. Commodity prices, for example, have been consistently decreasing with the increase of world GDP, arguably due to industrial and technological advancements and economies of scale. Since the new millennium, however, this trend has come to a halt as an Accenture analysis shows. Prices now rise in parallel

to world GDP growth (Lacy et al., 2015, 11). Whether this trend will continue to increase prices of raw materials, or alternative resources or methods for growth can be found remains to be seen. In the meantime, it is key to start thinking about how a business can be decoupled from rising material prices of virgin resources, at least to a certain extent. Several possibilities for different business cases exist to embrace the concept of a Circular Economy. It is also important to mention that Circular Economy is not just another term for recycling waste and feeding it back to the beginning of the value creation process, as some believe. It is much more, and an innovative mindset is needed to rethink the ways in which economies and businesses can be organized in the future when moving from linear value chains to such with circular loops. The recent Accenture publication ñWaste to Wealth ï The Circular Economy Advantageò aims at helping businesses to take the route of circularity by proposing five circular business models, which are based on a study of dozens of business cases worldwide (Lacy et al., 2015, xxi). The deducted business models are the Circular Supply Chain, Recovery & Recycling, Product Life-Extension, Sharing Platform and Product as a Service (Lacy et al., 2015, xxvii).

When defining the scope of this thesis, the webpage of segmentas was consulted that lists the 500 largest Swiss businesses (segmentas, n.d.). Starting from here and the five above-mentioned business models, several business model-industry combinations were taken into account. There are four reasons for discarding several possible combinations and choosing instead the Swiss fashion retail industry together with the business model Recovery & Recycling. Firstly, according to Google Trends, the Swiss business environment does not seem particularly advanced in circular topics. Therefore, a rather straightforward business model was chosen. Secondly, Switzerland is considered to rank among the best in recycling (swissinfo, 2016) on the one hand and a champion in waste production on the other, outperformed only by the United States and Denmark (swissinfo, 2015). These facts add to the relevance of Recoyery & Recycling in the Swiss business environment. Thirdly, the availability of public information for the industry and the respective enterprises influenced the decision as well. Finally, it was a question of personal interest coupled with currency. That includes Philips, only recently advertising a closed-loop manufactured vacuum cleaner or Adidas, sewing sneakers with Ocean waste. More about these two examples in the course of this thesis.

With the chosen combination of the business model Recovery & Recycling with the Swiss fashion retail industry, the following research questions is to be answered to address the above stated need for practical research:

- What is the current situation in the fashion retail industry concerning
    1. decoupling supply from harmful resources (environmental perspective)
    2. decoupling supply from scarce resources (economic perspective)
- Where does potential for development exist for the industry.

The thesis begins in the second chapter by reviewing literature and movements in connection to the Circular Economy. Moreover, a collection of different definitions of Circular Economy is discussed. From these definitions, an own definition for Circular Economy is composed in connection with the research questions. This chapter ends by briefly explaining the four other Accenture business models.

Following the methodology section, the business model Recovery & Recycling is illustrated in the fourth chapter with the example of adidas America Inc. (hereinafter referred to as Adidas) pointing the way towards unconventional approaches in creating value from hazardous waste or, as stated on the webpage ñFrom Threat into Threadò (Adidas America Inc., n.d.). After this lead-in, the business model is explained including a content analysis of two specific forms of the model that consists of open and closed loop supply chains. Moreover, this chapter contains the core of this thesis: the case study featuring two Swiss fashion retailers including parts of their supply chain ecosystem.

- **H&M Hennes & Mauritz SA** (hereinafter referred to as H&M) ñone of the worldôs leading fashion companiesò (H&M Group, n.d.-a).
- **Charles Vögele Mode AG** (hereinafter referred to as Vögele) ñthe leading Swiss fashion companyò (Charles Vögele Switzerland, n.d.-a).

By means of an in-depth analysis of sustainability and company reports, corporate webpages, databases, and newsfeeds the two enterprises shall be examined.

In a last step, chapter five assesses the insight gained from the two units of study. The assessment is based on the framework of open- and closed loop supply chains and on the self-composed definition of Circular Economy. Chapter 5 also suggests how their approaches could be developed further. The thesis ends with a conclusion in chapter six.

2 The Concept of Circular Economy

Traditionally, resources were seen as plentifully available. If one reserve was depleted, the next was already there to be exploited. Technological advancement made it cheap and easy to access large amounts of resources and to process them in the most efficient ways. The impact extraction or usage of resources might have on people and planet was of little concern. This traditional system has led to a state where Swiss consumption exceeds biocapacity by 340 percent as of 2012 (Global Footprint Network, n.d.-a). Humanity has already crossed four out of nine planetary boundaries, possibly resulting in irreversible changes of ecosystems (Steffen et al., 2015, 736), and is therefore moving into the next geological era in the history of the planet: from the Holocene into the Antropocene (World Wildlife Fund [WWF], 2016, 10). The crossed boundaries are biosphere integrity (genetic diversity), climate change, land-system change and biochemical flows (nitrogen and phosphorus) (Steffen et al., 2015, 736), with the latter being described in section 4.3.4.4 of this thesis. Moreover, rising prices and increased volatility have put pressure on businesses and economies (see section 4.3.4.1). For these reasons, a future with the resource-unproductive linear system of take, make, and waste is hardly possible.

ñWe are no longer a small world on a big planet. We are now a big world on a small planet [é].ò says Johan Rockström, Executive director at the Stockholm Resilience Centre, as cited in WWF (2016, 4).

The linear mindset contrasts sharply with the new way of thinking about shaping economies sustainably at the macro level and of circular business models at the micro level. In a circular mindset, resources are potentially harmful to the environment and scarce (United Nations Environment Programme [UNEP], 2012, 7). Scarcity leads to strategic importance of having access to the required resources in a sufficient amount, which in turn makes them extremely valuable for the survival and thriving of businesses and economies. Klare coins this ñ[é] the race for whatôs left [é].ò, resulting in ruthless competition of nations and businesses likewise (2012, 215), knowing that reserves are disappearing fast and immediate action is needed to secure access to the remnants of the earthôs initial bounty (Klare, 2012, 14). Russia, for example, planted its titanium national flag below the North Pole on the ocean floor in 2007, symbolically claiming the presumably resource-abundant territory (Halpin, 2007, 1). Focusing on businesses, this leads to the question of how resources can be secured in sufficient amounts to reduce dependencies

and risk. The answer lies in decoupling. The UNEP writes that ñThe most promising strategy for ensuring future prosperity lies in decoupling future economic growth from the rising rates of natural resource use and the environmental impacts [é].ò (2012, 16). Accordingly, this comprises two aspects:

1. Resource decoupling ï Fewer resources per unit of economic output e.g. GDP
2. Impact decoupling ï Reduced negative impact on the environment
   (UNEP, 2012, 16)

Figure 3, retrieved from a sustainability report of an advanced company in terms of Circular Economy, illustrates this well: resource decoupling from population and economy growth by means of Circular Economy.

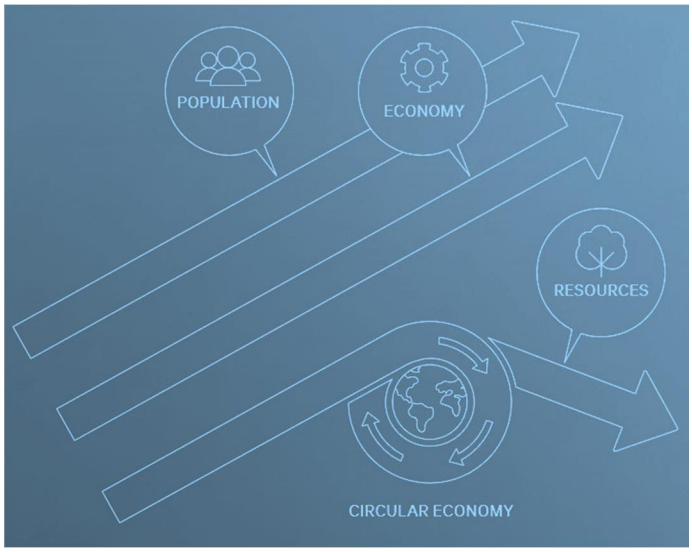

Figure 3: Resource decoupling from growing economies & world population (Retrieved from H&M, 2016, 36)

According to Lacy et al., Circular Economy is ñ[é] the decoupling of economic growth from the extraction and consumption of constrained natural resources, i.e., scarce resources with negative footprints, [é], where dependency creates a competitive disadvantage over time.ò (2015, xvii). An overview of options of how businesses can achieve decoupling is given in section 2.3. Apart from *new business models*, Circular Economy has further building blocks according to the Ellen MacArthur Foundation (introduced below). *Circular economy design*, for instance, facilitates product reuse and recycling. The third one, *reverse cycles*, includes improvements in supply chain logistics, effective sorting procedures and therefore reduction of the amount of material leaving the cycle. Finally, *enablers and favorable system conditions* support material reuse and recycling through the backing of policy makers, opinion leaders and beneficial market conditions

(Ellen MacArthur Foundation, n.d.-d). A Circular Economy rests, according to the Foundation, on three principles: First, preserve and enhance natural capital, second, optimize resource yields and third, foster system effectiveness (Ellen MacArthur Foundation, n.d.-e).

2.1 Schools of Thought: Circular Economy Refined

The Ellen MacArthur Foundation is a charity established in 2010. The declared mission is to promote the application of the Circular Economy concept and to accelerate the transition to it in academia, government and business. This is done by education and communication, providing valuable insights through analyses, accelerating circular innovation and initiating systemic initiatives (Ellen MacArthur Foundation, n.d.-a). The Foundation is arguably the strongest force in unifying similar or precursory ideas and thoughts and in pushing the concept forward. Several schools of thought have refined the generic content of Circular Economy (Ellen MacArthur Foundation, n.d.-c). In the following, these schools of thoughts are considered briefly.

Cradle to Cradle

The originators of this school of thought are William McDonough, an architect, and Michael Braungart, a chemist. After their publication ñCradle to Cradle: Remaking the Way We Make Thingsò in 2002 they have, a decade later, published ñThe Upcycle: Beyond Sustainability ï Designing for Abundanceò. These book titles given an indication of what their mindset is all about: ñHuman beings donôt have a pollution problem; they have a design problem.ò McDonough & Braungart write (2013, 7). Intelligent design results in plenitude and possibilities for reuse in biological or technical cycles (McDonough & Braungart, 2013, 15). This way of designing is guided by the nine Hannover Design Principles devised by McDonough & Braungart. Among these principles are relying on elemental design laws of nature itself, fashioning safe products of long-term value, acknowledging the fact of interdependence, acting responsibly considering that design has consequences for coexistence of humanity and nature, and including the experience of all stakeholders of a product or service into the design process (2013, 10). The framework is extended in their recent publication from products or service to the design of whole infrastructures such as homes, cities and workplaces (McDonough & Braungart, 2013, 11). A number of large companies and counting have already adopted Cradle to Cradle design principles (McDonough & Braungart, 2013, 20).

Performance Economy

Although McDonough and Braungart originated the previously described school of thought, Cradle to Cradle is a term coined by Walter Stahel, a Swiss architect and industrial analyst (Ellen MacArthur Foundation, n.d.-c). According to Stahel, the so-called Stone Age Economy and Industrial Economy are followed by the Performance Economy. Over these three periods, the value-per-weight ratios of various products manufactured in the respective economy ages have increased continuously (Stahel, 2010, 9). They have done so by companies starting to apply and embed smartness into products (Stahel, 2010, 13). The business imperative therefore lies in being value- instead of volume-driven, knowledge instead of energy & resource intensive and employing circular instead of linear systems (Stahel, 2010, 15). The objective of these focus shifts is to increase value-per-weight ratios, wealth and jobs, and in parallel to decrease resource consumption. Productivity in the sense of the Performance Economy is therefore, ñ[é] economic value achieved per unit of resource consumed [é].ò (Stahel, 2010, 84). Consequently, Stahel stresses a service economy. Selling performance instead of products internalizes the full costs of a productôs life cycle and incentivizes efficiency not only up to the point of sale but in the long run (2010, 86). Advantages are resource autarky and sufficiency on a macro- and microeconomic level (Stahel, 2010, 95). Stahel further differentiates between the Lake Economy and the Loop Economy. They are about ñ[é] two interlinked business models with different customers [é].ò (2010, 187). The Lake Economy optimizes ñ[é] the management of physical assetsò by continued ownership (Stahel, 2010, 201). The Loop Economy, however, ñ[é] is a grave-to-cradle approach starting at the end of a goodôs utilization.ò (Stahel, 2010, 223) by repair, remanufacture or recycle. Both of them intend to prevent waste. The former makes sound business sense because of the potential to save costs, the latter because dealing with waste is good business (Stahel, 2010, 188). Both of them have the potential to decrease material input significantly, yet at the expense of increased labor input to a much smaller extent. Bottom line, lowered costs and more jobs (Stahel, 2010, 200).

Natural Capitalism

According to the description on the webpage of the Ellen MacArthur Foundation, Natural Capitalism consists of four central strategies. Firstly, the productivity of natural resources has to increase drastically by designing, producing and employing technology more efficiently, thus, resulting in cost savings and reduced need for (especially natural) capital

and time. Secondly, waste is to be eliminated by changes in production processes and sustainable choice of materials following biological loops (Ellen MacArthur Foundation, n.d.-c). This is also known as Biomimicry, discussed in the subsequent paragraph. Thirdly, and in line with Stahelôs Performance Economy described above, economy is encouraged to provide value or services instead of products to incentivize resource productivity. Finally, natural capital should not only be used but also invested in, utilizing the savings made from employing the first principle (Ellen MacArthur Foundation, n.d.-c). In the book ñNatural Capitalism: The Next Industrial Revolutionò, the authors state that natural capital is apart from financial, physical and human capital the fourth capital base calling for reinvestment (Hawken, Lovins, A. B. & Lovins, L.H., 2010, 4). In giving natural capital the same status one creates ñ[é] a policy and business model for social and ecological restoration *and* economic prosperity.ò (Hawken et al., 2010, xi). Natural capital includes minerals, oil, forests, clean water, fresh air, soil, animals and their eco-systems. It embraces, according to the authors, the basis of the existence of humankind, which is now deteriorating rapidly (2010, 2), and thus creating scarcity of ñ[é] life-supporting services that have no substitutes and currently have no market value.ò (Hawken et al., 2010, 9). Hawken et al. argue that their four intertwined principles have the potential to reduce costs and enhance customer loyalty for any enterprise (2010, xii) and therefore make sound business sense. A. B. Lovins is chairman emeritus and chief scientist of the Rocky Mountain Institute RMI, an independent nonprofit organization. The RMI engages various stakeholders with the aim to adopt renewables cost-effectively through market-based concepts instead of fossil fuels (RMI, n.d.). Paul Hawken is an Executive Director on the board of the Biomimicry Institute. Biomimicry is the next school of thought shortly summarized.

Biomimicry

Biomimicry is not only an independent school of thought, but also part of Natural Capitalism as discussed above. Biomimicry is, considering its wording, when humans watch and learn from physical and chemical processes, reactions, and strategies nature employs, and then imitate those for their own purposes in design and production. Natureôs strategies base on a series of fundamental principles: ñNature runs on sunlight, uses only the energy it needs, fits form to function, recycles everything, rewards cooperation, banks on diversity, demands local expertise, curbs excesses from within and nature taps the power of limitsò (Benyus 2002, 7). Hawken et al. list several examples of natural processes being

superior to the ones humankind employs now. For example, the abalone, a marine animal, is reinforced with a shell tougher than the best ceramics produced by humans (2010, 16). On biomimicry.org, examples of how humans mimic natural concepts are given, for instance, an owlôs feather shape mimicked by turbine and fan engineers, or the architecture of a pomeloôs peel structure inspiring the design of safety applications. More than 1,800 further solutions to design challenges are freely available in the online library (Biomimicry Institute, n.d.-a). Janine Benyus, co-founder of this institute and biological science writer, might not have coined the term biomimicry, yet she contributed heavily to its popularization by publishing ñBiomimicry: Innovation Inspired by Natureò (Biomimicry Institute, n.d.-a). For Benyus, biomimicry is revolutionary not because of extracting from and ñdominatingò nature as with the industrial revolution, but because of learning from and imitating nature (2002, 2). Benyusô book features chapters of how to cultivate crops in synergy with and with the intelligence of nature, ñGrowing Food Like a Prairieò (2002, 11), how to harness solar energy more efficiently, ñGathering Energy Like a Leafò (2002, 59), how to manufacture more output with less (toxic) input, ñWeaving Fibers Like a Spiderò (2002, 95), how to make use of biologically active substances, ñFinding Cures Like a Chimpò, how to begin computing physically after years of binary code, ñComputing Like a Cellò (2002, 192), and how to react to increasingly scarce resources, ñRunning a Business Like a Redwood Forestò (2002, 238).

Industrial Ecology

The name of this school of thought has something inherently contradictory. Whereas the word ñindustryò can be reminiscent of chimneys emitting smoke, ecology evokes images of green fields. To begin with, a definition of industry might help to approach this school of thought. According to Graedel & Allenby, industry encompasses all human activity including extraction of resources, (crop) production, energy generation and consumption, transportation, as well as product or service use and disposal of waste (2003, 19). It is foreseeable that when trying to combine such a comprehensive idea of industry with ecology, a holistic, interdisciplinary (societal, biological, physical) approach is needed, with impacts on the practical design level but also at a corporate and systemic level (Graedel et al., 2003, 22). The essence of Industrial ecology is as follows:

> Industrial ecology is the means by which humanity can deliberately and rationally approach and maintain sustainability, given continued economic, cultural, and technological evolution. **The concept requires that an industrial system be viewed not in isolation from its surrounding systems, but in concert with them**

> [emphasis added]. It is a systems view in which one seeks to optimize the total materials cycle from virgin material, to finished materials, to component, to product, to obsolete product, and to ultimate disposal, Factors to be optimized include resources, energy, and capital. (Graedel et al., 2003, 18)

By viewing systems not isolated but in the larger context of their surrounding systems, the ecological aspect of Industrial Ecology is emphasized, taking biological systems as a role model. Industrial Ecology, therefore, is defined as ñ[é] the study of technological organisms, their use of resources, their potential environmental impacts, and the ways in which their interactions with the natural world could be restructured to enable global sustainability.ò (Graedel et al., 2003, 39). Consequently, and in line with the fundamental principles of nature listed in Biomimicry, Industrial Ecology takes a stance on rejecting waste as a concept, with the argument that in nature, no material is worthless (Graedel et al., 2003, 19). Therefore, a substantial part of the book is devoted to product and process design, material choice, energy-efficient design, considerations about design affecting product delivery and use as well as design for end-of-life. However, diving deeper into the matter goes beyond the scope of this thesis.

Blue Economy

The movement The Blue Ecomomy was initiated by Gunter Pauli, a Belgian businessperson. The idea lies in ñ[é] using the resources available in cascading systems, [é] the waste of one product becomes the input to create a new cash flowò as cited on the webpage of the Ellen MacArthur Foundation (Ellen MacArthur Foundation, n.d.-c). It advocates for local production systems and local consumption. Among the 21 principles constituting The Blue Economy are the following (The Blue Economy, n.d.-a):

- Solutions should mainly be based on local physical conditions such as pressure and temperature.
- Nature is a role model in which by-products or death of one organism is the source for the next one, efficiently consuming what is locally available.
- Gravity is the main source of energy, whereas water is the primary solvent.
- Finally, ñIn nature, negatives are converted into positives. Problems are opportunities.ò

Pauliôs wish is that The Blue Economy spreads as an inspiring open source community. The dozens of use cases employing the mindset of the Blue Economy are classified to be open source from the source (The Blue Economy, n.d.-b). Apart from the currently 112

cases in which solutions according to the 21 principles are presented for prevailing problems, Pauli has launched 200 projects including investments amounting to as much as 4 billion US dollars (The Blue Economy, n.d.-c). The Blue Economy is the active branch of ZERI, the Zero Emissions Research and Initiatives, ñ[é] a global network of creative minds seeking solutions to world challenges.ò (ZERI, n.d.). Also important to mention in the context of The Blue Economy is the Club of Rome since initially, the former began as a project of the latter to find solutions ñ[é] that could beneficially impact the economies of the world [é].ò (The Club of Rome, n.d.-a). The Club of Rome is based in Winterthur and is described as ñ[é] an organisation of individuals who share a common concern for the future of humanity and strive to make a difference.ò (The Club of Rome, n.d.-b).

Regenerative Design

In ñRegenerative Design for Sustainable Developmentò, published in 1994, the author Lyle already speaks about environmental degradation and resource depletion supporting it with statistical data from the World Resource Institute and the International Institute for Environment and Development (1994, 4). In 2017, over two decades later, the discussion agenda has apparently not changed that much. The 20th century with the industrialization has led to a disturbance of natureôs perpetual resource cycle, replacing it with one-way flows (1994, 4). Humankind has created efficient uniformity from pristine diversity, and thus shaped the landscape that shapes humankind in turn (Winston Churchill as paraphrased in Lyle, 1994, 25). However, Lyle states that it is not only the one-way flows of supply and demand being in disparity with the environment. The picture should be more holistic in considering design and architecture of landscapes and cities (1994, 7). Acknowledging the need for development considering the growing population and demand for materials and energy (1994, 19), Lyle stresses the importance of creating development in harmony with nature instead of focusing on mitigation strategies of human impacts, which he calls palliatives (1994, 8). Such sustainable development ñ[é] depends primarily on environmental design.ò, that is, regenerative design of systems (Lyle, 1994, 10) according to the role model of natural ecosystems (Lyle, 1994, 22) which disperse instead of concentrate and work decentralized instead of centralized (Lyle, 1994, 29). Therefore, regenerative design should orientate itself on five processes prevalent in nature: conversion, e.g. photosynthesis, distribution, e.g. by wind, water or animals, filtration, e.g. water flowing through soil and rock, assimilation, e.g. the decomposition

process and, storage, e.g. CO2 bonded in trees. The sixth process is human thought, which occurs everywhere where human development occurs (Lyle, 1994, 26-27). Even though regenerative design is sustainable, if processes are strained beyond absorption capacity, pollution, erosion and depletion occur (Lyle, 1994, 29). Lyle acknowledges that is is rather difficult and at the same time urgent to assess these capacities (1994, 30). He lists several strategies to design systems in a regenerative way according to natureôs role model. One example is employing predator species in agriculture instead of pesticides, and thereby making use of nature itself (1994, 38-39). Another idea is aggregating the various parts of a system so that they work in a self-sustaining way. Many more are mentioned, some of which are partly underway, such as the current digitalization of electricity distribution networks, using ñmultiple pathwaysò (Lyle, 1994, 42) to transport energy from and to consumers and providers through smart solutions. The John T. Lyle Center for Regenerative Studies at the Cal Poly Pomona University in California offers Masterôs programs and sees itself as a catalyst for pro-environmental development (Cal Poly Pomona, n.d.).

2.2 Discussion: Selected Definitions of Circular Economy

Peter Lacy, Accenture Strategist

ñEnough, for all, forever.ò is according to Lacy et al. at the very core of Circular Economy (2016, 5ô30ôô). Of course, this sounds promising and worth achieving. However, the way to get there is better described with the definition provided in Lacy et al.ôs publication Waste to Wealth as

> [é] the decoupling of economic growth from the extraction and consumption of constrained natural resources, i.e., scarce resources with negative footprints, like fossil fuels or hard-to-recycle metals and minerals, where dependency creates a competitive disadvantage over time. (Lacy et al., 2015, xvii)

Accenture as a global management consulting company understandably stresses the business perspective in this definition by referring to competitive (dis-)advantage. The flaw of this definition is the fact that scarce resources do not necessarily have a negative footprint. Moreover, it is odd to imply that some resources have a negative footprint and others not. If their usage can be compensated in some way, one could argue that no footprint existed at all. Looking at it the other way around, if fossil fuel has a footprint (CO_2), then everything else has a footprint as well. Using wood for heating emits CO_2 as well. Yet, a good point is made in mentioning the need for decoupling.

UNEP, United Nations Environment Programme

> A circular economy is an economy which balances economic development with environmental and resources protection. It puts emphasis on the most efficient use and recycling of resources, and environmental protection. A circular economy features low consumption of energy, low emission of pollutants and high efficiency. It involves applying Cleaner Production in companies, eco-industrial park development and integrated resource-based planning for development in industry, agriculture and urban areas. (UNEP, 2006, 1)

A comprehensive, policy-oriented definition demanding considerable change in industry and action from businesses. Questionable is the word ñbalancesò. If Circular Economy is to balance, then Circular Economy is not doing enough to prevent the destiny created by employing a traditional, linear model for decades, living on biocapacity credit since 1970 (Global Footprint Network, n.d.-b).

WRAP, Waste and Resource Action Programme

> A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. (WRAP, n.d.)

Many voices warn that Circular Economy should not be an alternative but an imperative if humanity is to survive, keep peace and be able to feed the world in the decades to come. Apart from that, this definition leaves unmentioned the environmental impact of certain resources such pesticides eradicating bees or substances that have led to the hole in the ozone layer. Moreover, ñextracting the maximum valueò is reminiscent of the greedy business models that were used in the past.

Ellen MacArthur Foundation, Catalyst of the Concept

> A circular economy is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times. The concept distinguishes between technical and biological cycles. (Ellen MacArthur Foundation, n.d.-e)

Particularly the aspect of regeneration can be positively highlighted in this definition. Regeneration is key from an environmental *and* economic perspective. That the concept distinguishes between two cycles is admittedly important, but can be considered as irrelevant to mention in a definition. The statement that a Circular Economy commences at the design stage is in line with the findings of this thesis.

Own Definition

> A Circular Economy is firstly regenerative by design. Then efficient by keeping resources at their highest utility and value for as long as possible to finally recover them for usage in new cycles. Circularity therefore decouples growth from an environmental and an economic perspective likewise.

This definition acknowledges that the capacity of products to be regenerated is defined already at the design stage. It opposes the throwaway mentality in stressing the value of resources. Most importantly, it combines the environmental and economic dimension of Circular Economy. It integrates the need for decoupling growth in every sense from limited or harmful resources. Moreover, it describes the circular process resources pass through. It is an attempt to use the essence of all the above given definitions.

2.3 Overview: Five Business Models as Proposed by Accenture

Circular Supply Chain

When a company produces from ñ[é] fully renewable, recyclable or biodegradable inputs [é].ò (Lacy et al., 2015, 35) either for its own operations or to supply the companyôs customers with it (Lacy et al., 2015, 37).

Product Life-Extension

This business model extends a productôs life cycle ñ[é] by generating revenue through longevity instead of volume.ò (Lacy et al., 2015, 70). It does so ñBy maintaining and improving products through repairs, upgrades, remanufacturing or remarketing [é].ò (Lacy et al., 2015, xxiii). Lacy et al. have identified six different primary activities applied by companies through which a productôs life can be extended: Build to last, Refurbish, ReCommerce, Upgrade, Refill and Repair (2015, 71).

Sharing Platform

The Sharing Platform basically capitalizes on idle assets and increases their usage either through co-use or exchange. The business model enables ñ[é] the renting, sharing, swapping, lending, gifting, or bartering of resources.ò Revenue is generated from charging a certain commission for the service provided to bring together supply and demand (Lacy et al., 2015, 85).

Product as a Service

It has some similarities with the Product Life-Extension model. Since the product remains in possession of the service provider, the company offers products that are built to last.

Longevity and reliability is key for being profitable with this business model (Lacy et al., 2015, xxiv) to keep service costs at a minimum. Lacy et al. differentiate between four forms: Pay for use, Leasing, Rental or Performance agreement (2015, 100).

The fifth business model Recovery & Recycling is considered in depth in the course of this thesis.

3 Methodology

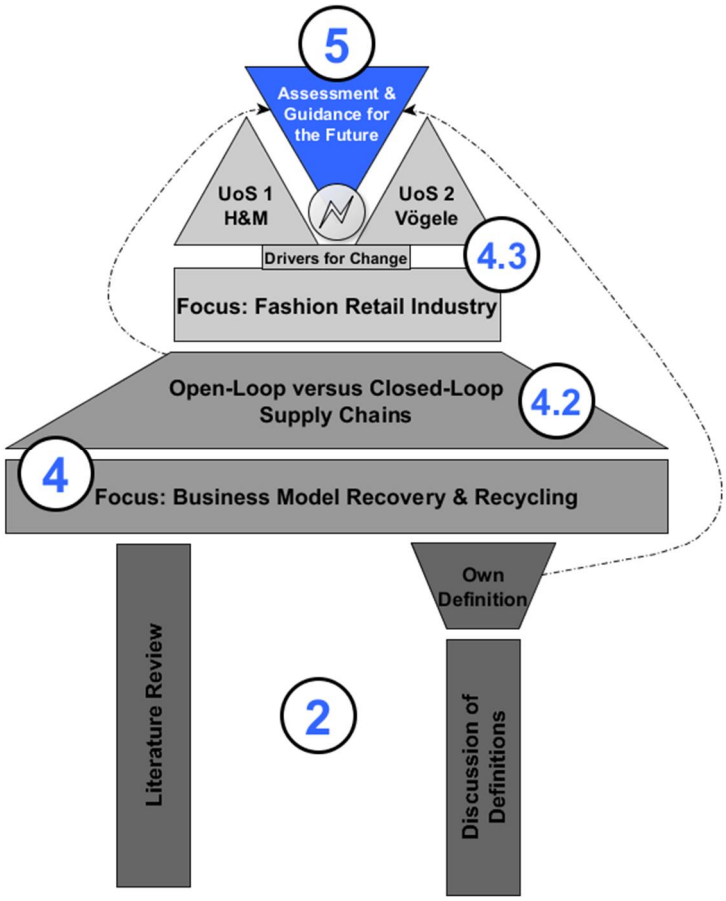

Figure 4: Methodology: graphical representation

In the following, the methodology underlying this Bachelorôs thesis is described according to the graphical representation depicted in Figure 4. It is numbered according to the table of contents. A qualitative research approach is applied throughout this thesis using qualitative and quantitative data from primary and secondary sources. Although the ñwhatò in the research question might lead to the readerôs assumption that a positivist epistemology underlies the present thesis, it is in fact an interpretivist one. That is, even

though the case study aims to uncover what the industryôs efforts in Circular matters are, the stress lies on exploring how it is done.

On the preceding pages, the pillars for this thesis have been elaborated by reviewing the topic Circular Economy including the various schools of thought associated with it, discussing current definitions and composing a definition to be the basis for this thesis.

In a second step, the focus now lies on Recovery & Recycling, which is one of five business models Lacy et al. have identified. Within Recovery & Recycling, the authors provide three special forms of the business model. Only two of them are relevant for the scope of this Bachelorôs thesis. The excluded form is about industrial production processes and how to operate on a zero waste basis. The two forms that are taken into consideration address the structure or the ecosystem of a supply chain that integrates end-of-life materials into value creation processes (Lacy et al., 2015, 54-55). The two forms are called open and closed loop supply chains. The framework of these two supply chain forms is approached on the basis of a content analysis supplemented with a discussion of benefits and challenges.

In a third step, a case study research strategy is followed within the Swiss fashion retail industry featuring two units of study. The case study approach was mainly chosen for two reasons:

1. The extent of circularity in H&Môs and Vögeleôs business based on a self-composed definition is hard to quantify. According to Mills, A. J., Durepos, G. & Wiebe, E. ñCase study research in business and management is often used to investigate issues that are difficult or impossible to study with quantitative research approaches.ò (2010, 94).
2. The topic Circular Economy is a rather current issue and the aim of this thesis is to study the application of it within the fashion retail industry. According to Yin this also provides the basis for a case study design: ñA case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, [é].ò (2009, 18).

The design of the case study follows an *embedded* (three units of analysis [UoA]), *multiple-case* (two units of study) design (Yin, 2009) with the type of case study aiming at being a representative one (Farquhar, 2012, 40).

	Single-case Design		Multiple-case Design			
Holistic Design (single UoA)	Context		Context			
	Case		Case 1	Case 2	Case 3	Case 4
Embedded Design (multiple UoA)	Context		Context			
	Case		Unit of Study 1		Unit of Study 2	
	UoA 1	UoA 2	UoA 1	UoA 2	UoA 3	

Table 1: Case Study Design Matrix (Adapted from Yin, 2009)

Why Multiple-case

Two companies are analyzed in a similar way, with H&M being the first unit of study and Vögele the second. The reason for employing two units of study is the fact that the Swiss fashion retail industry consists not only of multinational enterprises MNEs such as the Swedish H&M, the Spanish Zara or the Belgian C&A. Smaller retailers like Vögele or even local labels also have their market share in Switzerland. Therefore, in order to approach a representative picture of the Swiss fashion retail industry and thus supporting external analytic validity, the MNE H&M was chosen, since it is sales-wise the biggest player in Switzerland, along with Vögele, a smaller retailer with Swiss roots (Charles Vögele Switzerland, n.d.-b). Figure 5 shows the sales of the six leading Swiss fashion retailers over the past years.

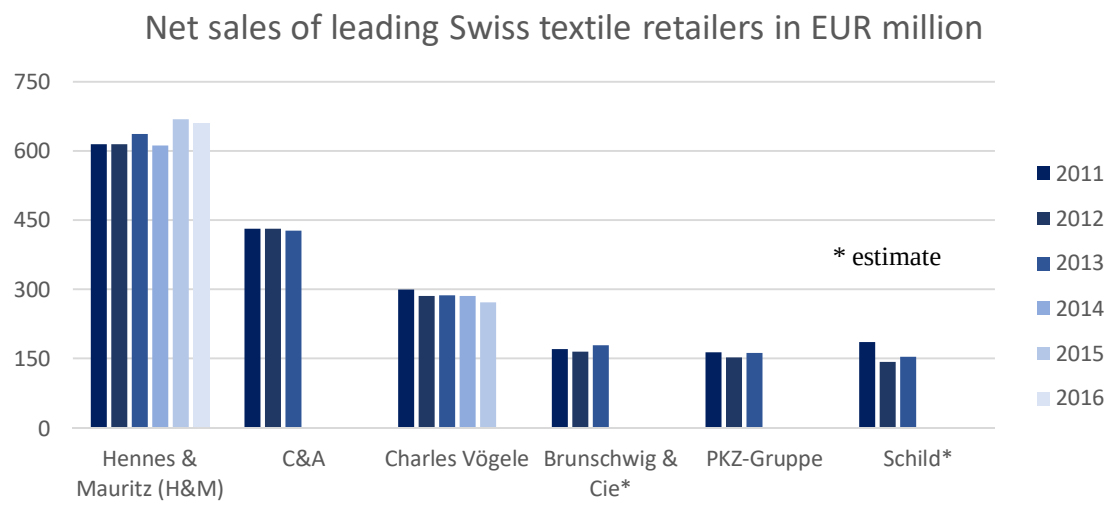

Figure 5: Sales of leading Swiss fashion retailers (Adapted from Statista, n.d. & supplemented with data from H&M Hennes & Mauritz AB, 2016, 4/ Charles Vögele Switzerland, 2015, 14/ Orbis, n.d.-d & n.d.-e)

Missing data due to unavailability. Supplemented data from 2014 onwards in US dollars, Swedish crowns or Swiss francs have been translated into Euro currency as of the exchange rate at the end of the respective years.

Why embedded

Three UoA are employed in an effort to gain a broader understanding of the respective companies, thereby, aiming at increased internal validity.

1. The first UoA analyzes the companies H&M and Vögele based on an overview of company information to get an impression of the size, performance and capabilities of the respective companies. This is mainly done through quantitative secondary data retrieved from the Orbis database.
2. The second UoA are the sustainability efforts by the two companies. Therefore, the companiesô sustainability reports were explored qualitatively and quantitatively. Considering the fact that sustainability typically embraces people, planet and profit, the focus is on planet and profit only, deliberately neglecting the sections dealing with the aspect people (and animal welfare). This scope is defined according to the economic and environmental dimension of the research question and the self-composed definition respectively. Moreover, the analysis works through the reports in chronological order. That is, information is cited from where it first appears unless more adequate or updated information is provided in more recent reports. The intention here is, that thereby the developments of the companyôs efforts can better be followed.

3. The third UoA are the service partners of H&M and Vögele. These are mainly analyzed on the basis of information retrieved from the respective company websites and with information from the Orbis database. Primary and secondary data sources of both qualitative and quantitative nature are explored.

In a fourth and last step, the two units of study are assessed inductively in order to answer the research questions. The assessment basis includes the drivers for change from section 4.3.4, the self-composed definition of Circular Economy and is based on the business model as proposed by Lacy et al. The two forms of Recovery & Recycling as discussed in sections 4.2.1 and 4.2.2 are applied to both units of study respectively, adapted and complemented to the environment of the companies under consideration. Finally, guidance for the future of the industry is provided.

4 Focus: Business Model Recovery & Recycling

4.1 A Lead-In: Recovery & Recycling at Adidas – From Ocean Plastic to Sportswear

According to Jambeck, J. R. et al., between 4.8 and 12.7 million metric tons of plastic have entered the ocean in 2010 alone. This number threatens to increase to a cumulative value of between 100 and 250 million metric tons by 2025 without improvement of waste management systems (2015). That is a huge problem because of the chemicals contained in the plastic, which is eaten by marine animals and moves all the way up the food chain until it reaches human food (Milman, 2014). In other words, people are eating and digesting their own waste. The consequences of this are still largely unknown. Research by the University of Exeter (2009), for instance, links water pollution to a rise in male infertility due to testosterone-blocking chemicals in rivers and consequently in wildlife. However, this floating pollution might not only be a threat: It could also be precious raw material ready to be collected and used. Adidas, together with PARLEY FOR THE OCEANS, a New York based organization, has taken action to recover plastic from the oceans and transform the ñthreat into threadò, as stated on adidas.com/us/parley (adidas America Inc., n.d.). With it, high-performance sportswear is produced and at the same time something good is done for the oceans. Adidas has committed itself to produce one million pairs of Ultraboost shoes out of 11 million plastic bottles by the end of 2017 (adidas, 2016). This professed goal is to be reached through a partnership with the aforementioned PARLEY FOR THE OCEANS. Their homepage, (which by the way has a domain name ending in

.tv for Tuvalu, an island state in the Pacific Ocean), contains disturbing material on the condition of the ocean and sea life (Parley, n.d.). Whether Adidas does this out of a true sense of responsibility or merely for marketing reasons with the aim to communicate a brand image of responsibility and sustainability is hard to judge. Nonetheless, Adidas might inspire others across industries, which would be without a doubt a very positive impact.

The reason why this example is a perfect lead-in for this Bachelorôs thesis is its irony: literally, this business idea is only viable with the ñoldò, linear model, where products were and are designed to ultimately find their end in landfills or ï in this example ï in the oceans. In other words, it is ironic to promote sustainability based on the havoc human-kind has already wreaked on the planet.

That, of course, does not lessen the value of Adidasô shining example. It can be said to point toward the beginning of a new era. Initially, through cleaning up the remnants of the industrial age and saving what can be saved and, subsequently, employing business models that are no longer in hostility but in unity with the planet.

4.2 The Business Model as Proposed by Accenture in Detail

The end goal of Recovery & Recycling is to make waste obsolete (Lacy et al., 2015, 52). Firstly, because of its potential value as a resource. The Ellen MacArthur Foundation states that, for instance, within the clothing sector of the UK ñ[é] a ton of collected and sorted clothing can generate [é] a gross profit of USD 1,295[é].ò (2013, 8). Secondly, because of its potential harm to the environment. Harmful either in itself, by being disposed of in landfills or as seen above in the oceans, or by pushing the usage of virgin materials and the extraction of it to the very limits of the earthôs capabilities. Many voices warn against the threat of resources running short, which is in line with an Accenture analysis that predicts a shortage of 30 billion metric tons of natural resources by 2050 if business continues as usual (Lacy et al., 2015, 15). With that said comes the third reason for eliminating waste in oneôs value chain: protecting the company from volatile and/or rising raw material prices.

In the past, many companiesô business models were based on calculated product life cycles, at the ends of which whose ends companies could sell newer versions of their products and therefore generate steady streams of revenue whilst competing mainly in product features, design and price and oftentimes not so much in long-term durability of

their products. This is also referred to as planned or built-in obsolescence (The Economist, 2009). However, with the forecasted shortages of raw materials and their rising prices in the near future, ñBusiness models that require high units of input or resources that exceed availability will not succeed in the future.ò, to use the words of Mathias Wackernagel, president of the Global Footprint Network as cited in Lacy et al. (2015, 16). It is therefore not by accident that many enterprises have joined forces to develop and refine circular business models together. The corporate directory of the Ellen MacArthur Foundationôs Circular Economy 100 (CE100), for instance, comprises C&A, H&M, IKEA, M&S, Bestseller, Kingfisher, The Renewal Workshop and Walmart, when filtering the list of participants for ñRetailò. The CE100 is a pre-competitive program to innovate faster through collaborating in Circular Economy affairs (Ellen MacArthur Foundation, n.d.). Companies participating in this program do so presumably with the aim to future-proof their businesses, starting to rethink their value propositions and how to capitalize, among else, on nothing less than waste as seen with the above example of Adidas. Future-proofing is essential because in the future, it might be of considerable importance to be capable of locking a companyôs resources in its own circular loop. That comprises at least two rather obvious changes. Firstly, reeducating customers to bring the product back to the point of sale. Secondly, designing a supply chain so that it is capable of moving goods in both ways and as efficiently as possible: new products downstream to the customer and end-of-life products upstream through the recycling processes and back to production facilities. How such business models can look in detail is suggested by different forms of the Recovery & Recycling model based on Lacy et al.ôs research:

1. Recover *any* end-of-life product to recapture value **(open loop)**.
2. Recover *your* end-of-life products to recapture value **(closed loop)**.
3. Recover waste materials and by-products from your own manufacturing process to recapture value (zero waste operations). (2015, 56)

In the following, only the first and the second form of the business model Recovery & Recycling are exemplified as stated in the precedent Methodology section. The third one is beyond the scope of this thesis since it comprises particularly the production processes and how to operate them on a zero waste basis to optimize raw material costs. The two forms under consideration, however, address the whole life cycle of a product, moving from creation of the product, to usage, to end-of-life recovery, to reprocessing of raw materials and finally, or initially, to the recreation process.

4.2.1 Analysis of Open Loop Supply Chains

As depicted in Figure 6, when an enterprise decides to recover products *indifferent of the brand* or manufacturing company, it employs, according to Lacy et al., an open loop supply chain. The aim is to retrieve the in the product embedded materials for recycling processes to finally create the same or a similar product again, a product of lower value (downcycling), a product of higher value (upcycling), or simply to generate energy through chemical processes such as combustion (Lacy et al., 2015, 57). A straightforward, maybe simplistic, example of open loop upcycling would be an artisan selling trinkets created from used coffee capsules.

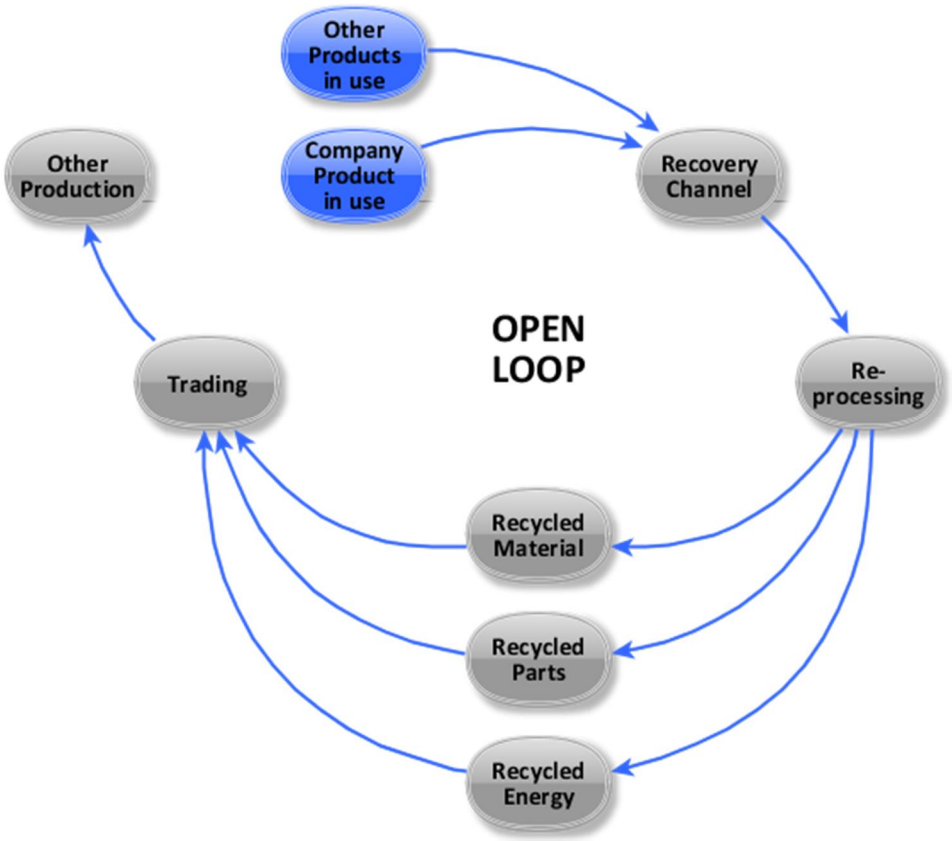

Figure 6: Stages in an open loop supply chain (Adapted from Lacy et al., 2015, 55)

According to an interview with Andrew Morlet, CEO of the Ellen MacArthur Foundation as cited in H&Môs sustainability report of 2014, open loop models are characterized by the fact that ñ[é] materials are brought back into the market pool.ò (p. 81) This is reflected quite precisely in the above model. By contrast, for closed loop models, as described below according to Lacy et al., Morletôs definition reads as follows: ñ[é] products, components or materials are being re-purposed into *either the same product or the same company*.ò (p. 81). Anticipating an example given below with Philips: this is as if

Philips were to recycle disposed Dyson vacuum cleaners into new Philips vacuum cleaners and it still would be considered a closed loop according to Morlet. That is interesting, since Lacy et al. do not make this distinction when considering Figure 3, but consider a loop as closed only when raw materials stay within the companyôs value creation process regardless of whether the same or another product is made.

4.2.2 Analysis of Closed Loop Supply Chains

When a company uses recycled material solely of its own brand, it employs a closed loop supply chain. This is depicted in Figure 7. One example of creating the same product anew is Caterpillar® with Reman. Reman is a program to recover end-of-life products and their components with sophisticated technology and giving customers the possibility of rebuying them at a lower price through Caterpillar®ôs Cat Dealer network, thus creating value for the company and its customers (Caterpillar, n.d.).

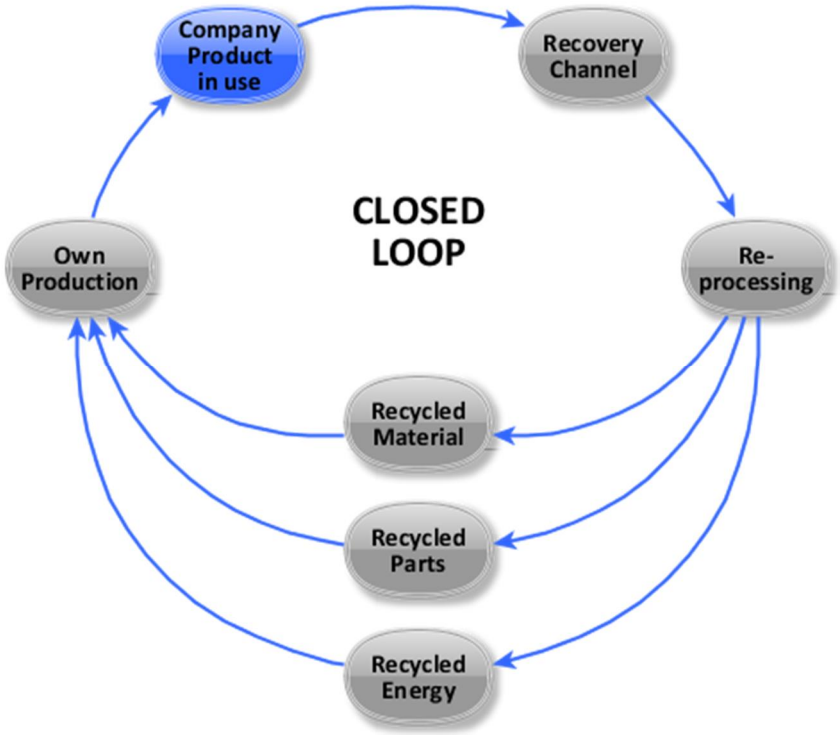

Figure 7: Stages in a closed loop supply chain (Adapted from Lacy et al., 2015, 54)

According to Lacy et al., closed loop supply chains are suitable primarily for companies that have already gained experience with the business model Recovery & Recycling, or which have matured from employing open loop to closed loop supply chains (2015, 60). It is not quite clear what is meant by ñcompanies that have maturedò, when considering the fact that oftentimes two or more companies participate in circular supply chains. With

other words, Lacy et al. fail to clarify that the stages of an open or closed loop supply chain are not necessarily fully integrated by one company, as it might seem when considering Figure 6 and Figure 7. In reality, the opposite seems to be true. Philips, a company doing business in healthcare, consumer lifestyle and lighting, one of the largest electronics companies in the world (Orbis, n.d.-a), recently launched a new vacuum cleaner, the Performer Ultimate. According to a Philips video advertisement from December 2016 on Philipsô YouTube Channel, the Performer Ultimate is ñmanufactured using a closed recycling loopò (Philips, 2016, 15ôô). The term ñclosed loopò is used because the proportion of recycled plastic used for the vacuum cleaner originates solely from disposed, Philips-branded vacuum cleaners. The whole reprocessing aspect of this closed loop supply chain is carried out by a specialist called Coolrec (Philips, 2016, 25ôô). Only vacuum cleaners that carry the name Philips are dismantled (Philips, 2016, 46ôô). Furthermore, Philip relies on another specialist, Veolia Polymers NL B.V., to have the plastic grind mix, generated by Coolrec, further refined (Philips, 2016, 1ô8ôô) which then is used to, eventually, manufacture a new Philips vacuum cleaner, the Performer Ultimate.

At this point, it seems important to know whether the specialists Coolrec and Veolia are hidden somewhere within the corporate structure of Philips, or somehow owned, to prove or discard the assertion that even a large player is not able or willing to fully integrate a circular loop. Therefore, a brief query was made in Orbis, a large database for corporate information. The insight is that both companies, Coolrec (it could not be determined whether it is Coolrec Belgium, Coolrec Nederland B.V., Coolrec B.V., Coolrec France or Coolrec Deutschland) and Veolia are *not* owned by Philips. Coolrec is owned by Renewi PLC, a UK based parent company via two subsidiaries (Orbis, n.d.-b) and Veolia Polymers NL B.V. is via Veolia Recycling Nederland B.V. owned by Veolia Environment, a French parent company (Orbis, n.d.-c). This example indicates how companies such as Philips currently depend on other specialized companies or conglomerates to close their material loops. In the Swiss fashion retail industry, which is the content of the subsequent pages, it looks much the same. Here, even the stage recovery channel is outsourced to specialists, as discussed further down.

Considering again Figure 6 and Figure 7, another significant difference between the two forms is apparent. Again, Lacy et al. (2015) do not clearly elaborate this difference in their work. The open loop supply chain is not only open because of accepting products of all brands into its cycle, but also because recycled materials, parts and energy leave the

cycle via trading to other production facilities of other companies. A closed loop supply chain, however, keeps the raw materials in the possession of the company, and that seems to be an important aspect in ensuring a competitive advantage for the future (Lacy et al., 2015, xvii). Put another way, a company is only able to really decouple its growth from increasingly scarce or harmful resources by closing its material loop. The UoS are explored in the following bearing this in mind.

4.2.3 Discussion: Deploying Open- / Closed Loop Supply Chains

A number of benefits are to be reaped when employing these forms of Recovery & Recycling. Lacy et al. list several such benefits (2015, 53-54). Albeit, these benefits are of rather apparent nature. Three of them concern the above-described two forms of Recovery & Recycling, and furthermore match the industry under consideration in this Bachelorôs thesis. They are described in the following.

Firstly, the possibility to reduce the companyôs environmental impact due to reprocessing end-of-life products and reintegrating them repeatedly into oneôs value creation process can be leveraged. Consequently, one might profit through lower usage of virgin resources and the energy required to produce these. A further benefit are the emerging possibilities for customers to dispose of no longer used or wanted products. This creates new interaction points between companies and customers resulting in increased foot traffic for brick-and-mortar stores. Exchanging end-of-life products for vouchers creates incentives for further purchases of the same brand and tries to reeducate customers to dispose of their no longer used products where they originally bought them. For the Swiss fashion retailer Schild, this scheme is not only about sustainability, but also about customer retention as cited in sda (2016). The third benefit is a challenge at the same time: when starting to replace virgin with secondary resources, the costs of goods sold can be reduced. However, costs of secondary materials are in all likelihood only lower if quality or performance have suffered through the recycling process. That, of course, is an economic contradiction since, when embarking on such a business model, one wants to simultaneously lower costs and have secondary materials of as high a quality as possible. The key lies in keeping the materials in the companyôs own value creation cycle. That follows from logical reasoning. Therefore, it seems that only through integrating the recovery and reprocessing channels a company might obtain secondary resources of high quality at a lower price compared with buying virgin resources. That, however, brings about another economic

problem. To integrate recovery and recycling processes one must first possess the necessary technological knowledge at command, and second, be able to generate sufficient economies of scale so that the business model remains economically viable. Or, as Lacy et al. puts it: ñIt ôs critical for companies to handle returning and reprocessing efficiently to preserve the cost advantage. If these processes cost more than what a company would spend to extract virgin resources, then the model becomes [é] unusable.ò (2015, 62). For these reasons, decoupling might necessitate not only aiming at closing the loop, but also controlling as many stages of the loop as possible.

4.3 Recovery & Recycling of Textiles in Switzerland Featuring Two Units of Study

4.3.1 An Industry Overview: Textile Recovery & Recycling in Switzerland

Figure 8 illustrates what happens when clothes are discarded by their owners. The figure is adapted from Magali An Berthon, a textile researcher and designer, and adapted to the Swiss market conditions with information found on the webpages of a Swiss charity (Texaid, n.d.-a) and of the Federal Office for the Environment ([FOEN], 2016).

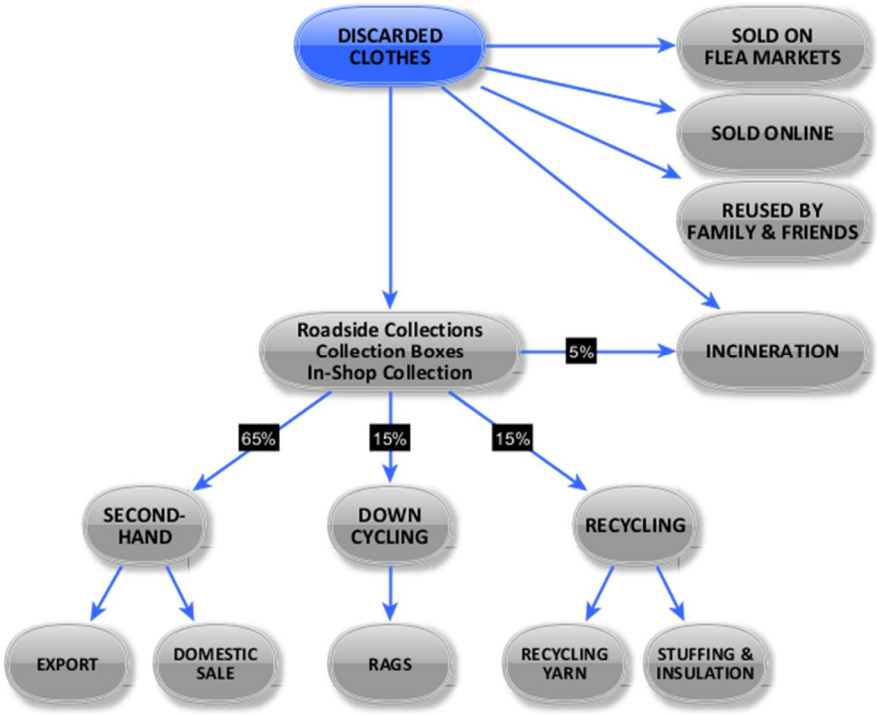

Figure 8: The ways discarded clothes go (Adapted from Berthon, 2016 & supplemented with data from Texaid, n.d.-f)

Once no longer wanted, clothes are sold on unofficial flea markets for clothing or online. The trading platform ricardo.ch for instance offers 35,038 pieces of used clothing as of 29 March 2017. Some other pieces are reused by family members or friends and even

others are simply thrown away. Yet, six kilograms of clothes per capita and year are collected in Switzerland, writes the FOEN (2016). The two players Tell-Tex GmbH (hereinafter referred to as Tell-Tex) and TEXAID Textilverwertungs-AG (hereinafter referred to as Texaid) currently share the market for the collection of used clothing in Switzerland (Textilkoordination, n.d.). The latter clearly dominates the market, with annual collections of 80,000 metric tons according to the numbers on its webpage (Texaid, n.d.-a), whereas the former contributes only around 17,000 metric tons as of the year 2015 and stated in its annual report (Tell-Tex GmbH, n.d.). These numbers are confusing since the FOEN estimates the amount of collected clothing and shoes at a total of 50,000 metric tons, which is only half of the amount claimed to be collected by Texaid and Tell-Tex together. The FOEN writes further that the collection is traditionally effected with roadside collections or collection boxes at selected locations all over Switzerland (2016). Newer are in-shop collections. An article in the Tagesanzeiger of 7 October 2013 reads that I-Collect AG (hereinafter referred to as I:CO) entered the market for the collection of used clothing as a third player with the mentioned in-shop collection approach (2013, 3). In the same month, Texaid integrated the same collection strategy with its first partners modissa and Schild according to its online newsroom (Texaid, 2013a).

One thing becomes quite clear when considering the above stated current market condition of the recovery channel of the Swiss fashion retail industry: Swiss fashion retailers rely heavily on specialists collecting the material initially sold by the retailers, with all the consequences described in the previous section 4.2.3. They presumably do so because, according to Lacy et al.ôs words, ñItôs better to collaborate with others to sync [...] customer engagement, and reverse logistics [é].ò (2015, 150). Moreover, Lacy et al. suggest getting enablers on board should the company lack the capability and/ or scale or scope needed and they ñhelp companies to reduce time, cost, complexity, and risk [é].ò (2015, 122). How such partnerships can look is examined in somewhat more detail in the following sections based on two units of study.

4.3.2 Unit of Study 1: H&M with I:CO

4.3.2.1 H&M in facts & figures

The first unit of study focuses on an international player headquartered in Sweden. H&M arguably plays a major role in the Swiss fashion retail industry, even though it is not possible to find current numbers or statistics on H&Môs market share in Switzerland.

H&M is operating in 51 countries directly and in 14 through franchising as of February 2017. Customers can choose between six H&M owned fashion brands, yet, not every brand is available in every country (H&M Group, n.d.-b). It is active in design, production and retail of all kinds of clothing, cosmetic products, accessories and footwear. The five biggest markets for H&M are Germany, the United States, the United Kingdom, France and the Peoples Republic of China. They cumulatively contribute, in descending order, almost 50 percent to total sales (Appendix 1), which are over 20 billion US dollars. Switzerland is in the ninth position sales-wise after Sweden, Italy and Spain. These are numbers as of the end of 2015 (Orbis, n.d.-d). H&M runs 4,393 stores worldwide as of February 2017, and counting. Ninety-nine of them are apportioned to Switzerland (H&M Group, n.d.-b). Operating such a network of stores around the globe requires an impressive workforce of 161,000 employees to date and worldwide (H&M Group, n.d.-a). When considering pertinent key figures, H&M seems to be a thriving enterprise worth investing in. Over the last 10 years, market price, earnings, cash flow and dividends per share have approximately doubled. With an average price/earnings ratio of 23.2 as of the end of 2015 the H&M stock also does not seem to be under- or overvalued. A gearing (ratio of debt and equity) of only 8.32 percent adverts to a healthy capital structure and a ROCE (return on capital employed) of 43.34 percent to an economic employment of capital (Orbis, n.d.-d).

4.3.2.2 Sustainability and circularity of H&M's business model

All sustainability efforts of H&M are until and including 2015 consolidated under the program ñH&M Consciousò and encompass the economic, the social and environmental circumstance of the company (H&M, 2011, 4) or, put simply, people, planet, profit. The breadth and depth of H&Môs efforts are considerable. This is proven by the various awards received and by rankings in pertinent indexes such as the Dow Jones Sustainability Europe/ World Indexes (H&M, 2015, 12). Basis for analyzing H&Môs efforts were the six most recent sustainability reports. The 2011 report is the first one taken into account since it is the first time the collaboration with I:CO is mentioned. Unlike the reports 2011 to 2015, the 2016 report follows a newly developed strategy and heralds H&Môs new vision and strategy based on ñ[é] an inclusive and science-based process.ò (H&M, 2016, 14). According to the strategy of the analysis described in the methodology section, the focus lies on H&Môs Conscious commitments ñBe climate smartò, ñReduce, reuse, recycleò and ñUse natural resources responsiblyò.

In their 2011 Sustainability Report H&M acknowledges the urgency of action in the light of resource scarcity and its effect on rising costs (H&M, 2011, 71). H&M learned this the hard way when struck by soaring cotton prices in 2011, seriously affecting its bottom line (Ward, A, 2011). H&M further states that in order to stay competitive in the industry, ways must be found to increase resource efficiency on all levels, namely water, electricity, agricultural land and oil (H&M, 2011, 71). This makes sense considering the fact that one cotton t-shirt equals seven kilograms of potatoes on the resource level (H&M, 2012, 13). H&M is determined to use its size and scale to ñ[é] bring about systemic change in the industry [é]ò (H&M, 2012, 7) and to lead this change ñ[é] towards fully circular and truly sustainable fashion.ò, to use the words of Anna Gedda, Head of Sustainability at H&M (H&M, 2015, 6). The challenge for H&M lies in the nature of its value chain. Substantial parts of it are not or only partially controlled by the company. The simplified value creation process depicted in Figure 9 shows for each stage the degree of H&Môs influence (bars) and its climate and water impact in percent (H&M, 2014, 9-10).

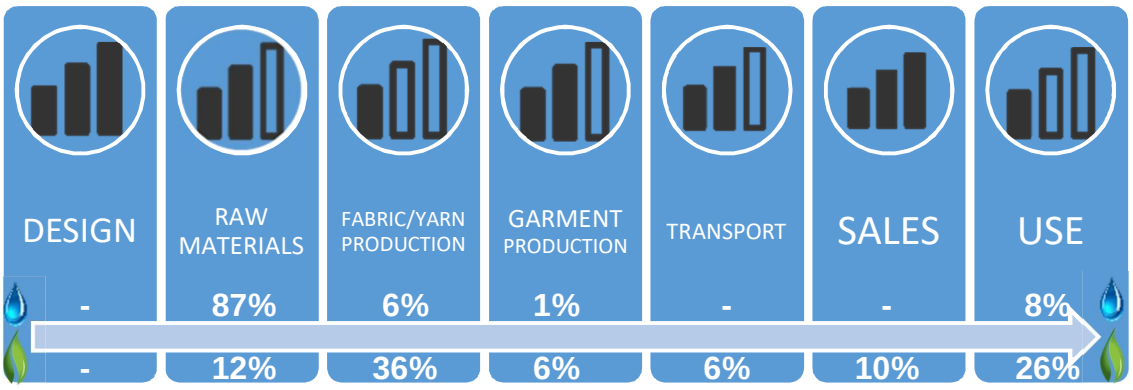

Figure 9: H&M's simplified value chain (Adapted from H&M, 2014, 9-10)

Initially, the influence the company could take on both raw materials and fabric/ yarn production was low (H&M; 2011, 6). H&M was, however, able to increase influence for these two stages over the years from low to medium control through integrating more and more indirect suppliers into its compliance framework (H&M, 2016, 20). However, H&M sources from a variety of around 850 suppliers who themselves have subcontractors reaching up to 1,926 in number (H&M, 2014, 27). As of 2016, the company still procures from many indirect suppliers for which no direct business relationships exist. Forty-four percent of fabric mills are not yet under H&Môs supplier assessment systems (H&M, 2016, 51). A similar problem exists for the production of conventional cotton that is sometimes difficult to trace (H&M, 2016, 20). The company sources from a multitude of

EMEA countries, the Far East and South Asia (H&M, 2011, 44), adding to complexity in employing common safety, environmental and social standards. Influence exists, however, in the form of a multitude of guidelines, restrictions, a code of conduct, audits, supplier ratings, incentives, trainings (H&M, 2013, 22) and continuous participation in coalitions working together with NGOs and academia with the aim to set industry standards (H&M, 2013, 20). H&M is, as mentioned above, active in a broad variety of endeavors to support their sustainability strategy. In the following, the attempt was made to list some these endeavors in the order of the above depicted value creation process (Figure 9).

It is important to realize that circularity starts at the **design** phase (see own definition of Circular Economy on page 45). H&M promoted for example a fashionable patchwork dress out of differently colored pieces of recycled fabric sewn together (H&M, 2011, 67). In 2012, H&M designed the clevercare label in collaboration with Ginetex, owner of the global care label standard. The label, as depicted in Figure 10, is sewn-in in garments to help customers reduce the current 36 percent after-sale environmental impact when clothes are washes and tumble-dried (H&M, 2012, 24). It took until 2014 to implement the labelling in all H&M brands (H&M, 2014, 24).

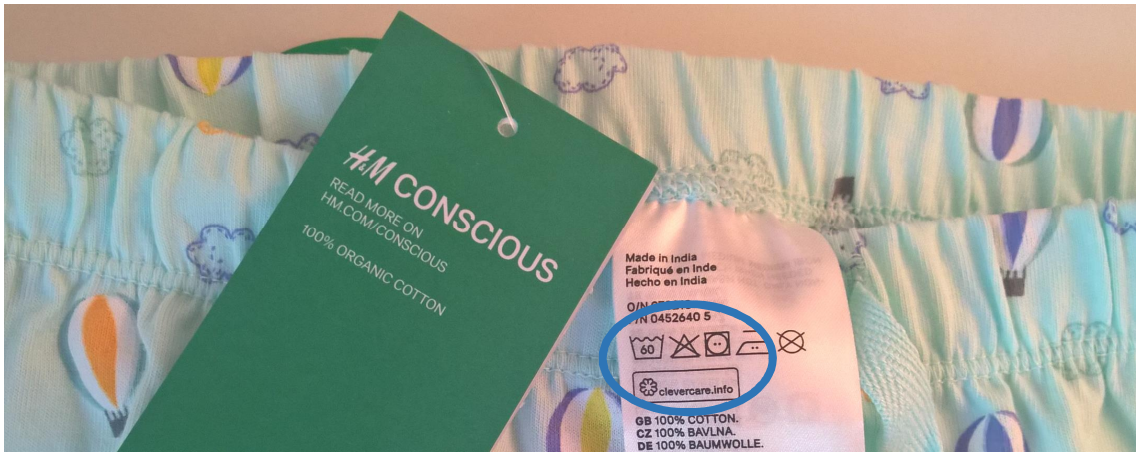

Figure 10: Photo of Anna-Marija's H&M Conscious trousers with the clevercare label

With design having a major impact in choosing the materials and therefore highly influencing the **raw material** stage, the company started to replace conventional cotton with other raw materials. Organic hemp, for example, is now used in some H&M garments with the effect of having a much lower ecological footprint than cotton or linen since it requires less water, fertilizers or pesticides and is, moreover, habitat-wise less fastidious (H&M, 2011, 14). Material choice has a huge impact on the overall footprint of the value

chain with raw materials currently being responsible for 87 percent of the water and 12 percent of the climate impact. Yet, replacing a high-impact material such as cotton (Higg MSI, n.d.) with a state-of-the-art material such as Tencel®, a wood-based Lyocell fiber (Lenzing, n.d.), does not solve the problem alone. To ensure that timber for the Lyocell fibers does not contribute to clear cutting rainforest, H&M teamed up with the NGO Canopy and other leading brands to avoid viscose materials coming from deforestation (H&M, 2015, 20). The mentioned Lyocell and organic hemp fibers are only two of many raw materials from H&Môs Conscious material list (H&M Group, n.d.-c). A garment containing fibers from this list with a share of at least 50 percent (20 percent for recycled cotton) already qualifies to be tagged with the H&M Conscious label (H&M, 2013, 16). For denim products, the Conscious label is granted if not more than 35 liters of water are used per piece (H&M, 2015, 103). In Figure 11, H&Môs evolution in deploying the mentioned sustainable materials can be followed.

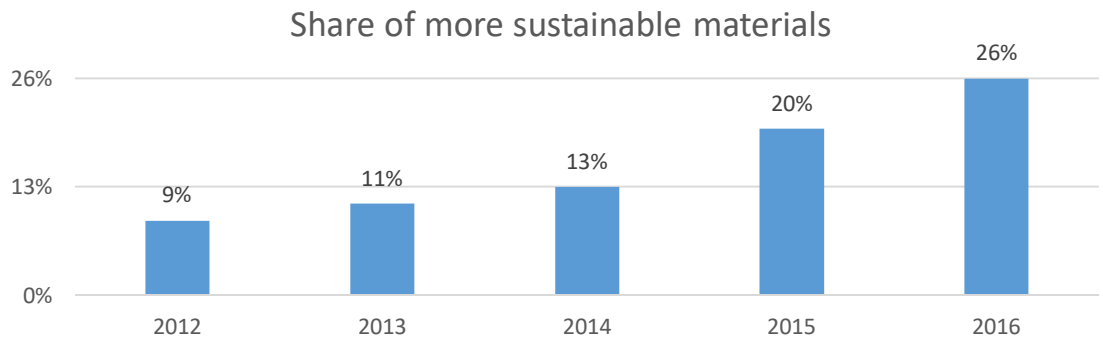

Figure 11: Usage of more sustainable materials over past years (H&M, 2014, 7/ 2016, 44)

The target declared in 2016 is to deploy 100 percent of such materials by 2030 (H&M, 2016, 39). Another conscious material from the list is recycled polyester (PES) used to gain synthetic fibers. Recycled PES is considered to be Conscious because according to an environmental fiber benchmark of the NGO MADE-BY, recycled polyester is a Class B fiber together with organic cotton (Made-By, n.d.). The deployment of recycled PES continuously increased as depicted in Figure 12.

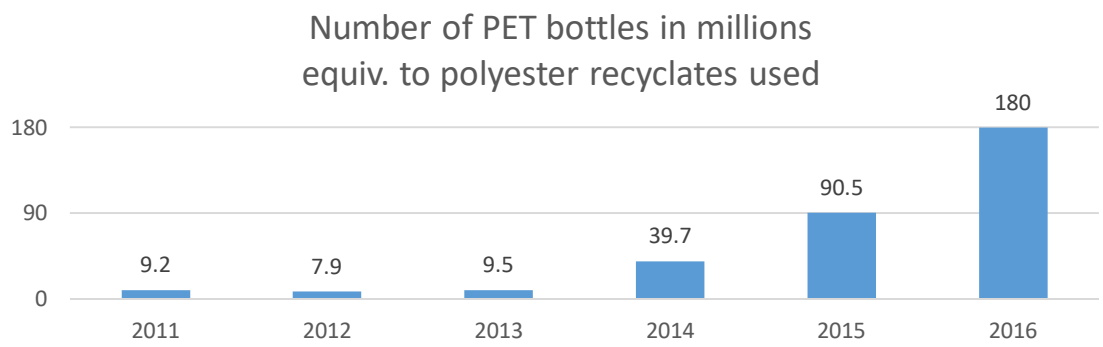

Figure 12: Usage of recycled PES over past years (H&M, 2014, 86/ 2015, 93/ 2016, 33)

Before H&M had created a conscious material list, interest was focused mainly on more sustainable cotton including organic cotton, cotton from the Better Cotton initiative and recycled cotton. Figure 13 shows H&Môs evolution in deploying the more sustainable cotton. In 2011, only organic cotton contributed to the eight percent share of more sustainable cotton (H&M, 2012, 19) and recycled cotton began contributing only from 2014 onwards (H&M, 2016, 45).

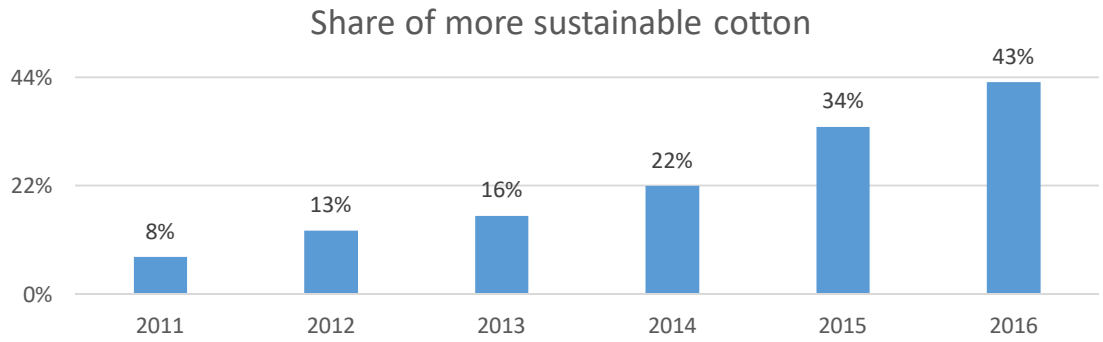

Figure 13: Usage of sustainable cotton over past years (H&M, 2015, 18/ 2016, 45)

With seemingly low shares of organic cotton in 2011 and 2012, H&M was already world leader in using organic cotton (H&M, 2012, 93). In 2016, the company is still in second position according to the NGO Textile Exchange (H&M, 2016, 12). Moreover, H&M is world leader in Better Cotton demand according to information on the webpage of the Better Cotton Initiative (Better Cotton Initiative, 2017). In 2012 alone, the companyôs demand of organic and Better cotton avoided 140,000 kilograms of pesticides (H&M, 2012, 71). H&M declared in 2011 already that its target is to reach 100 percent of more sustainable cotton in its products by 2020 (H&M, 2011, 13), thereby, avoiding up to 1,077 metric tons of pesticides in 2020 to make a rough estimate.

Apart from reducing pesticide through the selection of raw material sources, H&M has joined forces with Greenpeace to ban a variety of other chemicals from the stages **fabric/ yarn production and garment production** in an effort to detox its value chain completely by 2020 (H&M, 2011, 16). By 2016, H&M was, along with Inditex (ZARA) and Benetton, leading the Greenpeace Detox Catwalk 2016 and earning the Avant-Garde status (Greenpeace, 2016). Measures to detox include a variety of actions:

H&M increased usage of water-based glues in shoes instead of solvent-based ones by 200 percent (H&M, 2012, 22). In 2013, 21 percent of all shoes in H&M shelves were made with water-based glue, with the goal of reaching 100 percent by 2020 (H&M, 2013, 14). Moreover, the company banned, as one of the first in industry, the chemical perfluorinated compounds (H&M, 2012, 79). In collaboration with chemistry giant Bayer, H&M also developed a handbag using only water-based polyurethane (PU) instead of solvent-based PU (H&M, 2012, 80). Finally, H&M began integrating leather-supplying tanneries into its sustainability assessments, to further control the use of harmful chemicals (H&M, 2016, 46).

In the stage **garment production**, denim and other water-intense production processes were optimized, saving hundreds of millions of liters of water (H&M, 2011, 76). This was, among others, accomplished with Jeanologia, a Spain-based consultancy with expertise in denim (H&M, 2014, 96). The continuously decreasing water footprint was propelled further in 2012 through initiating a partnership with WWF, aiming to implement a so-called water stewardship strategy (H&M, 2012, 73). Water is a critical input factor for the industry, since 8,500 liters of it are required to grow the cotton contained in one piece of denim (H&M, 2013, 73), to refer back to the stage raw materials. In 2014, a conscious denim collection based on innovative techniques was launched. The production of these jeans uses up to 56 percent less water and 58 percent less energy than conventional production (H&M, 2014, 19).

Utilizing reusable transport boxes instead of cardboard boxes to move garments from distribution centers to stores is just one example of H&Môs optimizations at the **transport** stage (H&M, 2011, 69). Although transport is responsible for no more than six percent of the value chainôs climate impact, H&M aimed at only deploying service providers that are registered in pertinent partnerships active in climate protection. Whereas the status of this target was ñmore to doò in the 2013 report (H&M, 2013, 57), it changed to ñdoneò in

2015, deploying a 100 percent of transport service providers supervised by environmental schemes (H&M, 2015, 84).

Improvements at the **sales** stage encompass reduction of energy per store square meter continuously by installing LED lights (H&M, 2011, 77), water-efficient equipment across direct operations (H&M, 2013, 70), and the declared target to deploy store concepts being 80 percent circular by 2025 (H&M, 2016, 39). Worth mentioning is also the fact that H&M produced 784,200kWh solar energy from its own photovoltaic panels in 2012. The company is pursuing the target of a 100 percent electricity from renewable sources for the owned value chain stages design and sales (H&M, 2012, 62). In 2016, this figure already reached 96 percent (H&M, 2016, 61). However, the impact of H&Môs own operations amount to only a small fraction of its value chain. Therefore, the company decided to take a more holistic approach in renewables in 2016, targeting not only their own stages design and sales, but the whole value chain (H&M, 2016, 63). Hence, not only a climate *neutral* value chain is pursued, but a *positive* one, to be reached by 2040 through efficiency, renewables and offsetting (H&M, 2016, 117 & 57). Using heat from cooling down servers in data centers to heat apartments is just one example in the area of efficiency (H&M, 2015, 80).

At the last stage, **use**, which is at the same time the beginning of a new cycle, an in-store garment collecting program was initiated in collaboration with I:CO. A pilot project in 17 Swiss H&M stores was launched in 2011, where customers received a voucher for each bag of returned garments (H&M, 2011, 67). This pilot was expanded to a global level in 2012, but without really closing the loop: All collected garments were sold and then reused or recycled by third parties for cleaning cloths or insulation material (H&M, 2012, 68). In other words, the raw materials left H&Môs value creation chain. The reason lies in lacking the technology to generate recycled fibers durable enough to reuse in new clothing (H&M, 2012, 68). This issue still holds in 2016, with only a small proportion of collected and recycled materials being used (H&M, 2016, 43). To counter this shortcoming, H&M tries to propel innovation. All surplus from selling the in-store collected garments flows into the companyôs foundation (H&M, 2016, 54) and is then allocated, among others, to investments in technical innovation (H&M, 2016, 54). One example is the Global Change Award that H&M launched in 2015 with the aim of rewarding cutting-edge ideas that have the potential to advance the industry (H&M, 2015, 122). Two years earlier, the collection system was expanded to every single H&M store, and the first so-

called closed-loop denim products were launched (H&M, 2013, 62). In 2015, the number of closed-loop garments increased to 1.3 million. However, these closed-loop products contain as to date only 20 percent of self-collected recycled cotton. This is the maximum percentage of recycled cotton fiber still allowing guaranteed quality and durability (H&M, 2016, 45) due to the above-mentioned technological immaturity. Apart from the recycling challenge of cotton fibers, a similar problem must be overcome with recycled polyester (PES) fibers. According to the the 2014 report, problems in dyeing recycled PES fibers were encountered, making it even more important to invest continuously in closed-loop innovation (H&M, 2014, 84). The collection is nevertheless ongoing, with a cumulative amount of more than 40,000 metric tons of garments intended for reusing and recycling (H&M Group, n.d.-a). Figure 14 depicts the evolution of H&Môs collection efforts, with the 2012 numbers being low since they reflect only the mentioned pilot project in Switzerland.

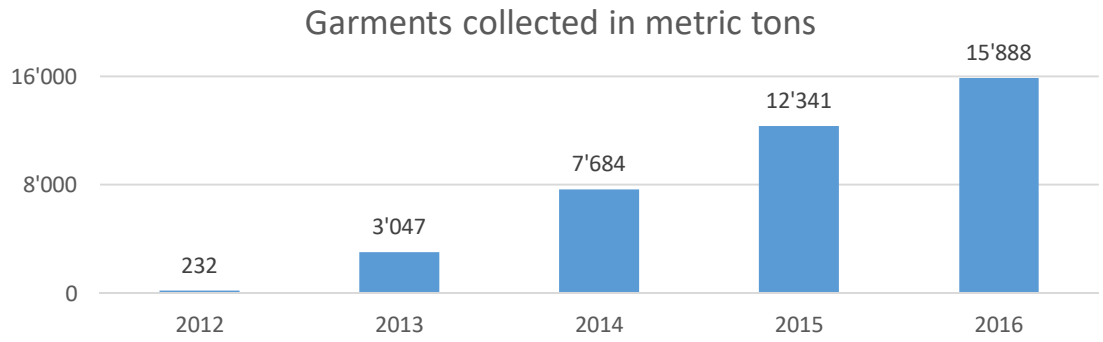

Figure 14: Garments collected over the past years (H&M, 2014, 83/ 2016, 54)

In conclusion, it is interesting to see that in the report of 2013, a closed loop supply chain is depicted for the first time (H&M, 2013, 61). The need to change from a linear to a circular business model is acknowledged in the 2014 report, and with it the term Circular Economy is mentioned for the first time (H&M, 2014, 3-4). In the 2015 report, the closed loop supply chain introduced two years earlier is completed with the steps reuse and recycle (H&M, 2015, 89). For implementing the step reuse, an investment in Sellpy was made. Sellpy is a Swedish startup providing solutions for bringing together sellers of no-longer-used garments with buyers of second-hand garments (H&M, 2015, 90). Additionally, in the same year, H&M became a global partner of the Ellen MacArthur Foundation, thereby contributing to the circular agenda including the promotion of innovation (H&M, 2015, 92). It is not until 2016, however, that the necessity to *decouple* business growth

from the use of resources is acknowledged (H&M; 2016, 38). This is evidence that the core of Circular Economy has taken hold in the business world only recently.

4.3.2.3 Service Partner I:CO

It becomes complex when adjusting and transforming a one-way into a two-way supply chain. That is at least one obvious reasons why H&M teamed up with, among many others, I:CO, a specialist in this field. Lacy et al. write, ñThis outside help is key to the companyôs implementation of the [é] Recovery & Recycling business models [é]ò (2015, 122). I:CO was founded in 2009, has its headquarter in Germany and subsidiaries in Japan, the UK and the United States. Since its foundation it has collected 70,000 metric tons of garments, and more than 40 retailers rely on I:COôs services (I:CO, n.d.-c). Among those are, apart from H&M, Adidas, C&A, Calzedonia, Mammut, NewYorker, OVS and many more (I:CO, n.d.-d). The company describes itself as a ñ[é] global solutions provider and innovator for collection, re-use and recycling [é]ò. With its global activities in around 60 countries, I:CO profits from massive economies of scale. Its value proposition consists of an ñInnovative, cost-effective in-store collection concept [é]ò with the claimed positive side effects of increased foot traffic to stores and engagement of customers through instant rewards (I:CO, n.d.-a). Moreover, I:CO supports partners in closing their fiber loops through recovery of fibers (I:CO, n.d.-b). Such fibers are then used in H&Môs so-called closed-loop denim products (H&M, 2013, 62), for example. However, as explained above, insufficient recycling technology limits the amount of recycling fibers demanded in the end. Therefore, a presumably high percentage of fibers is being sold as post-consumer waste, finding new purposes in other industries as depicted in section 5.1.1, Figure 17. Another activity of I:CO includes the stage *sorting* (not entered into in detail), that is, which garments can be reused and which ones have to move further down the recycling process (I:CO, n.d.-b). The sorting stage is important, since the higher the percentage of garments that can be reused, the more positive the circular impact, as exemplified antecedently.

To obtain background information about I:CO, the Orbis database was consulted, with interesting results. I:CO is, along with seven other subsidiaries, fully owned by the German SOEX Textil-Vermarktungsgesellschaft M.B.H, which is itself owned by VOSOP AG, the Swiss-based global ultimate owner of the corporate group (Orbis, n.d.-f). While I:CO only collects garments in stores of partners, another subsidiary called

EFIBA collects garments in Germany over charities such as the Red Cross, from municipalities, industry and private individuals via container, street and bring-in collections (Textilwirtschaft, 2016 & EFIBA, n.d.), just like Texaid in Switzerland (Texaid, n.d.-c). Two other subsidiaries, presumably the SOEX Trading GmbH and the SOEX Textil-Recycling GmbH trade with the post-consumer waste, whereas even another subsidiary called Modemarkt Freestyle GmbH trades the garments selected for reuse in vintage stores in Hamburg, Berlin or Munich (Textilwirtschaft, 2016 & PICKnWeight, n.d.-a). The second-hand stores are operated under the brand PICKnWeight, where the vintage garments can be bought on the basis of price per kilo (PICKnWeight, n.d.-b). Another subsidiary trading collected garments is Cash 4 Brands GmbH. It operates an online shop selling second-hand designer fashion at affordable prices, offering direct purchase from private individuals (cash4brands, n.d.). To conclude, I:CO is one building block in a network of companies that together build the whole circular loop for textiles. This insight is depicted in Figure 17, section 5.1.1.

4.3.3 Unit of Study 2: Vögele with Texaid

4.3.3.1 Vögele in facts & figures

Vögele, incorporated in 1955, has ï at the time of writing ï 760 stores in Switzerland, Germany, Austria, Slovenia and Hungary (Charles Vögele Switzerland, n.d.-a). Considering all markets, Vögele is, with net sales of 803 million Swiss francs in 2015 (Charles Vögele Switzerland, 2015, r3), tiny compared to H&Môs 21.4 billion Swiss francs business of the same year (H&M Hennes & Mauritz AB, 2016, 3). Expressed as a percentage, Vögeleôs global net sales are 3.75 percent of H&Môs. According to its description in the Orbis database, Vögele is a family apparel retailer selling ñfashionable, well wearable, high quality and affordable clothing for ladies, gentlemen and childrenò. With this strategy, Vögele can be described as occupying a ñstuck-in-the-middle positionò. Figures on Orbis of the Charles Vögele Holding AG, headquartered in Pfäffikon SZ, substantiate this assumption. Vögeleôs stock price development over the past 10 years exhibits a lack of success, from 150 Swiss francs per share in 2007 tumbling to an all-time low of currently below 10 Swiss francs. Negative earnings and cash flow per share as of the end of 2015 and a book value lower than market value are not favorable signs for the company. Finally, the indebtedness has reached enormous levels with a balanced gearing (ratio of debt and equity) of around 50 percent in 2006, rising to almost 240 percent in 2015. Still employing around 6,000 employees, profit per employee was minus

10,000 in 2015 (Orbis, n.d.-e). Consequently, a large part of Vögele stores in Germany were sold to TEDi, WOOLWORTH and KiK (Tensid, 2017a). Vögele used to have stores in Belgium and the Netherlands as well. However, the respective subsidiaries both went bankrupt: Charles Vögele Belgium in November 2016 (Reuters, 2016) and Charles Vögele Netherlands in January 2017 (Tensid, 2017b). In the meantime, Sempione Retail AG has made an all-cash public tender offer for Vögele shares, and OVS SpA, an Italian clothing retailer, has acquired 35 percent of Sempione Retail AG, with the aim of introducing OVS brands instead, causing the well-known, purple Vögele brand to vanish from Switzerlandôs fashion retail landscape. After an 18-month conversion plan, Vögele will be fully acquired by OVS SpA (Womenôs Wear Daily, 2016). As of March 2017, already five Vögele stores have been converted to OVS stores and by summer 2017, most of the Vögele stores will be gone (sda, 2017).

4.3.3.2 Sustainability at Vögele

Notwithstanding the looming closedown of this company with a long-standing Swiss tradition, this unit of study is used to complete the picture of an industry in which not only multinationals such as H&M are present but also smaller players. Vögeleôs sustainability efforts are, therefore, relatively limited compared to the achievements H&M has made over the last years. Since the first mention of in-store garment collection activities was found in the 2014 report, the analysis of Vögeleôs actions starts at this point. This section embraces, therefore, the reports of 2014 and 2015, since the one of 2016 is not yet published. According to the strategy of the analysis described in the methodology section, the focus lies on chapter one, two and five of Vögeleôs annual reports, which are ñOur Customers and Productsò, ñOur Suppliersò and ñEnvironment and Climate Protectionò.

Vögele designs its collection at its head office in Pfäffikon SZ. Moreover, purchasing and logistics planning are centralized at the same location. Procurement is done via offices in the respective countries where the garments are manufactured (Charles Vögele Switzerland, 2014, 27). This concerns mainly Asia and additionally, around eight percent, Europe, Turkey and Africa (Charles Vögele Switzerland, 2014, 28). Vögele stated that it wants to extend its Bio-Cotton assortment for the childrenôs collection. At Vögele, a Bio-Cotton garment contains 85 percent certified organic cotton (Charles Vögele Switzerland, 2014, 26). As of 2015, the extension of organic cotton in the childrenôs collection was implemented and a new target was set to use organic cotton for the whole collection of

childrenôs outerwear only (Charles Vögele Switzerland, 2015, 22). The company characterizes itself as a low-impact business concerning the use of resources. Nevertheless, Vögele has decided to take several steps to take its share of responsibility in reducing CO_2 emissions. That means for Vögele a focus on the usage of renewables, awareness of the climate impact of transport, multi-way containers for moving garments between distribution centers or stores, and recycling of waste. Defective clothes hanger, for example, are granulated and remanufactured for further use. Moreover, the company started to cooperate with Texaid, giving its customers the possibility to return their no longer wanted clothes to one of their stores (Charles Vögele Switzerland, 2014, 31). According to media information of January 2016, this collaboration officially exists since the beginning of 2015 (Texaid, 2016).

4.3.3.3 Service Partner Texaid

Historically, Swiss charities used to collect clothes for the needy. However, from an economic perspective, this is not worthwhile since the effort needed to match an item to a new owner exceeds the value of the item (Städler, 2013, 2). Maybe because of this a coalition of several Swiss charities and a private partner formed Texaid in 1978. The ultimate vision was to collect, sort and recycle discarded garments in a professional way (Texaid, n.d.-d). The coalition still meets its moral obligation to support the needy through monetary donations (Städler, 2013, 2). To make such donations possible, profit is generated according to the below depicted shortened Figure 15 from section 4.3.1. **Export:** Firstly, sells second-hand clothing to not specified countries (Texaid, n.d.-h). According to Orbis, Texaid operates ï at least in Bulgaria ï own resale facilities over a subsidiary (Orbis, n.d.-h). Städler assumes the market value of second-hand clothes on the international market to be somewhere around 0.95 Swiss francs per kilogram (2013, 2). Brooks supports this number in depicting in an article in Geographical the value and amount of such exports. Applying the value against the amount results in 0.88 US dollars per kilogram (2015, 2). On the cost side, Texaid pays around 0.15 Swiss francs per kilogram of collected clothes (Städler, 2013, 2). **Domestic Sale:** Texaid sells items that are more valuable over the trading platform ricardo.ch (Städler, 2013, 2) or on one of the two online shops styluxe.com and styleflow.com, owned by its subsidiary Carou GmbH (Orbis, n.d.-g). Moreover, Texaid operates 40 second-hand shops in Germany, also by way of a subsidiary (Texaid, n.d.-j). **Rags:** Thirdly, profit is generated from Texaidôs online shop for cleaning rags (Texaid, n.d.-i). **Recycling Yarn/ Stuffing & Insulation:** As for the 15

percent that go into recycling, no information is available other than the fact that Texaid aims at integrating recycling processes, as mentioned below in the recycling paragraph.

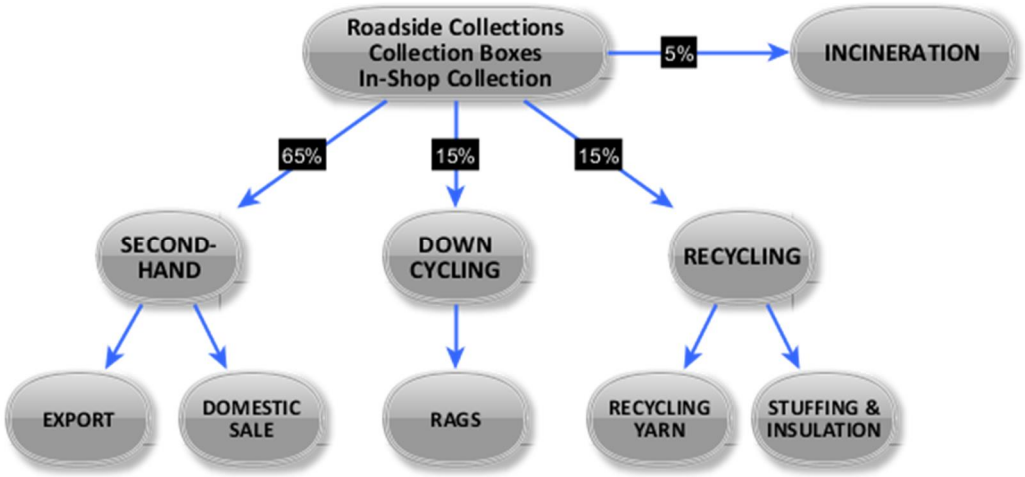

Figure 15: The ways discarded clothes go (Adapted from Berthon, 2016 & supplemented with data from Texaid, n.d.-f) shortened

Collection

In 1979, the first mobile collection of garments was carried out and 14 years later the first container was commissioned with this collection form gaining ground until 3,000 containers were placed by 2007 (Texaid, n.d.-d). To date, Texaid commissions over 6,000 containers (Texaid, n.d.-e). It took another six years until Texaid started collecting garments in partnership with retailers through an in-shop system (Texaid, n.d.-d). Starting with modissa and Schild (Texaid, 2013a) other partners such as Esprit, OVS and Vögele joined the Texaid in-shop collection (Texaid, n.d.-b). Concerning the partnership with OVS: it is yet to be seen, whether OVS Switzerland will continue to work with Texaid when all Vögele stores will be gone as described in section 4.3.3.1, since in Italy, for example, OVS partners with I:CO (OVS, n.d.). As of now, the OVS stores in Switzerland are partnering with Texaid (Texaid, n.d.-b).

Sorting

The first sorting facilities were opened in 1982 in Schattdorf, Uri. In 1999, another one followed in Zurich. By 2008, the Schattdorf facility was modified to a computer-based sorting facility. Two years later, one in Bulgaria and one in Hungary were opened (Texaid, n.d.-d). At the stage sorting, the economic and ecological value of the collected garments is determined. With efficient sorting (Texaid, n.d.-f), more garments can stay ñat their highest utility and valueò, to say it with the words of Ellen Mac Arthur as cited in H&M (2015, 91).

Recycling

As can be seen above in Figure 15, Texaid sorts its raw materials quite effectively with an incineration rate of only five percent. Still, Texaid aims higher endorsing the fact that closed loop cycles are of high importance and, supporting research in this field. The declared goal is to gain raw materials from their collected garments (Texaid, n.d.-g).

4.3.4 Drivers for Change in the Global Textile Industry – The Business Case

ñ[é] a company has to know where it is vulnerable to resource constraints, and the risks associated with those constraints.ò (Lacy et al., 2015, 119). H&M names several resources that are important for the business and at the same time becoming scarce (H&M, 2011, 71). Therefore, such constraints are considered in the paragraphs below, completing the fourth chapter. The idea with this section is to provide some in-depth background information about the opportunities and risks prevalent in textile industry and retail likewise, thereby stressing the importance of embarking on a circular future as proposed in the assessments in chapter 5.

4.3.4.1 Raw Material Prices

While in the last century resource prices progressively declined, this trend came to a halt in 2000. Various developments contributed to this such as unprecedented income rises, the over-average growth of large economies and many resources becoming increasingly difficult and therefore expensive to extract (McKinsey, 2013, 5).

According to an info graphic of Cooper Hewitt, 96 million metric tons of textile fibers were produced in 2015 alone (Berton, 2016). Around one-third of demanded fibers are natural and two-thirds are synthetic, according to a leading fiber producer and innovator (Lenzing, n.d.). Not only are synthetic fibers made of oil, other raw materials used for fiber production are influenced by oil prices as well. According to a McKinsey Report, agricultural commodity prices correlate with the oil price due to fuels being a major cost driver in planting, cultivating, harvesting and transporting these commodities (2013, 9). Figure 16 shows the development of selected commodities relevant for the fashion industry from 1990 onwards. Timber was selected because it is the resource for cellulose fibers, accounting for almost seven percent of global fiber consumption (Lenzing, n.d.). As seen in the H&M case, other fiber sources are currently employed as well. However, these were not available for selection.

Figure 16: Indexed prices of selected raw materials (Retrieved from an interactive tool: McKinsey, 2013)

	Price Change (change in %)		Volatility (quarterly st.dev. relative to the mean)	
	Q1 '90 – Q4 '99	Q1 '00 – Q1 '14	Q1 '90 – Q4 '99	Q1 '00 – Q1 '14
Oil	22	288	9	82
Cotton	-40	78	16	35
Wool	-43	129	16	48
Timber	17	33	25	29

Table 2: Price Change & Volatility of selected raw materials, comparing two periods (Retrieved from an interactive tool: McKinsey, 2013)

The data shows a massively increased price change in percent and volatility for all commodities when comparing the period from 1990 to 2000 with the period of 2000 to 2014. Whereas strong fluctuations in the past where due to the World Wars or an oil shock in 1970, McKinsey states that there is evidence of the recent volatility being of a more long-term nature due to structural changes (2013, 5-6).

4.3.4.2 Availability of Water

Apart from the dependence on oil, agriculture relies heavily on water. The share of agriculture's water use accounts for almost 70 percent of global water use (McKinsey, 2013, 9). It is also not by accident that factories of the textile industry cluster around river deltas, roughly 300 factories at the Brahmaputra in Bangladesh and at the Yangtze in China, respectively. As can be seen above in Figure 9, production processes are responsible for seven percent of water and 42 percent of climate impact. An even higher impact on water is attributed to the stage raw materials with 87 percent.

A 2016 global risks report of the World Economic Forum lists water crises in ninth place in terms of likelihood, and in third place when it comes to the severity of the impact (World Economic Forum [WEF], 2016, 3). A water crisis is defined as ñA significant decline in the available quality and quantity of fresh water resulting in harmful effects on human health and/or economic activity.ò (WEF, 2016, 86). Excessive groundwater consumption by agriculture has already depleted and degraded a handful of high quality and easily accessible aquifers around the world such as the North China Plain (Food and Agriculture Organization of the United Nations [FAO], 2011, 119). A water crisis impacts the fashion industry in manifold ways: crop shortfalls, impossibility to carry out water-intense production processes, unavailability of electricity in case of employing hydroelectric power, productivity loss of the labor force or even migration due to armed conflicts, which might necessitate relocation of facilities.

4.3.4.3 Availability of Agricultural/ Arable Land

Due to unsustainable farming and increased demand, considerable shares of the worldôs arable land are under stress (FAO, 2011, 134). With population growth and new groups of consumers arising from emerging economies, the demand for food and fiber grows. The global middleclass is projected to increase its spending by almost 60 percent (OECD Development Center and Kharas, 2010, 28). Increased spending can be due to, for example, changing standards of nutrition from vegetal diets to more meat and dairy products, which puts even more pressure on land and water (FAO, 2011, 52). Ironically, regions contributing the lionôs share to population growth have the least water and land resources available to meet their increasing demand. This will result, amongst other things, in competition for land, crop and livestock production, and urbanization (FAO, 2011, 103-104). This is already happening in Africa, for example, where foreign governments or investors buy up African farmland (Klare, 2012, 11-12) ï colonialization part two, as some believe.

4.3.4.4 Pesticides & Fertilizers

Key nutrients for cotton production accounting for a fifth of global fiber demand (Lenzing, n.d.) are nitrogen, phosphorus and potassium (Cottoninfo, n.d.). Of course, the price developments of fertilizers are mirrored in cotton prices in the end. Prices for rock phosphate (phosphorus), potassium, and urea (nitrogen) skyrocketed in 2008, and have not yet returned to the level before the economic crisis of the same year (indexmundi, n.d.-a/-b/-c). Additionally, fertilizer consumption in kilograms per hectare of arable land has increased by over 30 percent since 2002 (The World Bank, n.d.). Agrochemical

pollution caused by pesticides or excessive use of fertilizers is ñ[é] a serious and wide-spread problem [é].ò (FAO, 2011, 118) because of polluting various water bodies and soil (FAO, 2011, 118).

4.3.4.5 Possibilities for Reprocessing

Traditional mechanic recycling is not much more than shredding the material, thereby damaging the structure of the thread. As a result, the downcycled shredded material can mainly be used for stuffing and insulation. Recycling technologies are needed to enable the closing of the textile loop. Evernu has devised such a technology, where cotton textile waste is converted into a liquid pulp before it is spun into a new yarn again (Evrnu, n.d.). An article reported that Levi's sewed the first prototype jeans out of 100 percent of such recycled yarn, which would not be possible with conventional recycled yarn (Peters, 2016). A publication of the Ellen MacArthur Foundation reports other companies such as Patagonia (outdoor clothing) and Aquafil (nylon recycling) successfully employing such chemical recycling procedures (Ellen MacArthur Foundation, 2013, 56). Moreover, Worn Again has even devised a method to separate polyester from cotton in the recycling process (Ellen MacArthur Foundation, 2013, 57), which is important considering the fact that many garments are made with a mix of materials.

5 Assessment of Units of Study

In this chapter, answers to the research questions shall be given on the basis of the two units of study. The research questions are as follows:

- What is the current situation in the fashion retail industry concerning
    1. decoupling supply from harmful resources (environmental perspective)
    2. decoupling supply from scarce resources (economic perspective)
- Where does potential for development exist for the industry.

The answers are likewise connected to the self-composed definition from the beginning:

> ***ñ****A Circular Economy is firstly regenerative by design. Then efficient by keeping resources at their highest utility and value for as long as possible to finally recover them for usage in new cycles. Circularity therefore decouples growth from an environmental and an economic perspective likewise.****ò***

In the following, the forms of Recovery & Recycling as discussed in sections 4.2.1 and 4.2.2 are adapted to the environment of the two companies under consideration. Some-

thing that was added for both compared to the base-model is the stage ñDisposal & Incinerationò. The simple notion was that probably not 100 percent of products reach the recovery channel. Instead, some clothing is thrown away, ending up in incineration plants, which at least in Switzerland produce energy.

5.1 H&M's Approach

5.1.1 Assessment

Based on the three UoA in the H&M unit of study and on the theoretical framework of the Recovery & Recycling model, H&M can be classified as being a player in a mixed supply chain form, a combination of open and closed loop. An illustration might look as depicted in Figure 17.

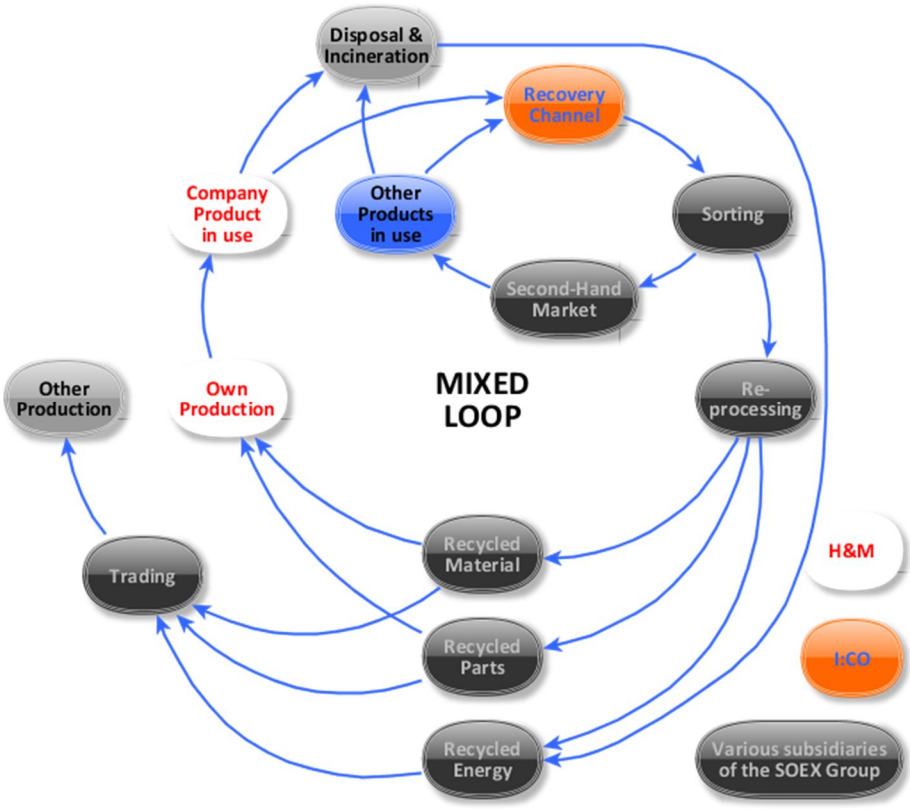

Figure 17: H&M within a mixed-loop supply chain (Adapted from Lacy et al., 2015, 54-55 & supplemented with information from own analysis)

Closed loop because of two things (see the two arrows pointing to Own Production): Firstly, recycled parts enter the H&M production when using intact pieces of recycling fabric sewn together to create new garments as done with H&Môs patchwork dress (H&M, 2011, 67). Secondly, recycled material enters the H&M production through products containing some percentage of recycled fiber such as the closed-loop denim products

launched in 2013 (H&M, 2013, 62). However, the mass of all garments collected ends up in the open loop supply chain. With better recycling possibilities arising from research, the ratio closed/open loop is going to rise for the better. Concerning the stages of the mixed loop I:CO or other subsidiaries of the SOEX Group are involved in: it is quite difficult to determine who is is responsible for what. A clue is given on I:COôs webpage, reading for many stages ñI:CO organizesé ò meaning that most likely other subsidiaries are involved. Yet, this division of business is not a central aspect for this thesis.

The first part of the research question addresses decoupling from harmful resources or, the environmental perspective.

In section 4.2, reasons were given for making waste obsolete, which is a central aspect in several schools of thoughts as well. Now, from an environmental perspective, meaning decoupling from potentially harmful resources, H&M is on its way to a fully closed loop Recovery & Recycling business model. The efforts in detoxing its value chain through finding other innovative solutions to reach the same destination and the deployment of a wide variety of raw materials, less harmful than conventional cotton, are just two examples of that. Yet, H&M is heavily dependent on the research in this field, and on the capabilities of the recycling industry. Moreover, the discovery of new materials for fibers that meet quality and durability requirements and at the same time are suitable for recycling is of high importance for H&M to close the loop. However, H&M does not leave that simply to chance. It is actively engaging in research, think tanks and coalitions. Examples are the mentioned membership in the CE100, H&Môs collaboration with the Hong Kong Institute of Textiles and Apparel HKRITA, and the launch of H&Môs own award for scientific breakthroughs in the field funded by the H&M foundation. Deploying a scientific approach from the 2016 report onwards to measure its achievements is a further indication of H&M having largely decoupled from potentially harmful resources from an environmental perspective.

The second part of the research question addresses decoupling from scarce resources or, the economic perspective.

In section 4.2, more reasons were given for making waste obsolete: its potential value as a resource, protecting the companyôs revenues from the risk of volatile or rising raw material prices and improving reputation. Most likely, H&M receives a certain sum per collected metric ton of garments. An article of the Textilwirtschaft writes that in Germany, SOEX pays 300 Euros per metric ton collected (Textilwirtschaft, 2016). Städler

writes about associations receiving between 0.15 and 0.2 Swiss francs from Texaid and Tell-Tex, respectively, for each kilogram of garments collected. That amounts to 150 and 200 Swiss francs per metric ton, respectively (2013, 2). Therefore, a certain return for the in-store collections of H&M is generated. When it comes to decoupling from increasingly scarce resources, however, meaning the aspect of projected rising raw material prices or price volatility, it looks different. Here the assessment depends largely on the price model H&M has negotiated with I:CO or the SOEX Group, respectively. In other words, and from a financial perspective, it can only be called decoupling if the price per metric ton of collected garments follows the dynamics of the commodity markets. Due to the unavailability of such information and considering the low vertical integration of the depicted mixed loop supply chain by H&M, decoupling from increasingly scarce resources has not been as successful as decoupling from an environmental perspective up to now. At least, by deploying a variety of different raw materials, H&M has a certain room to maneuver when some prices develop worse than others do. H&Môs efforts in water management and more water-efficient processes have also to be mentioned here as a positive aspect considering section 4.3.4.2 Availability of Water.

5.1.2 Guidance for H&M's Future

It is not necessary to search long to find valuable ideas for the future. The Global Change Award 2016, awarded by H&M, for example, brought forth interesting new raw material sources such as by-products of citrus juice production or cultivating algae to gain fibers. Another idea is to employ microbes to recycle polyester textiles (H&M, 2015, 122). Other possible steps derive from an interview with the CEO of the Ellen MacArthur Foundation in H&Môs report of 2014, namely design for disassembly and fashion as a service (H&M, 2014, 82). In another interview with Ellen MacArthur herself, she proposed to shift the focus away from volume and fast fashion to a more holistic perspective (H&M, 2015, 91), which may be a bit of wishful thinking, since fast fashion can be said to be what consumers demand from retailers - at least currently. H&Môs self-declared strategy of 2016 to become ñ100% Circular & Renewableò is based on four pillars (H&M, 2016, 40):

1. Circular Design
2. Choice of Materials
3. Production Processes
4. Prolonging the Life Cycles of Products

Effectively, it is all about design since design, largely influences pillars two to four. The Royal Society for the Encouragement of Arts, Manufactures and Commerce [RSA] proposes various design models. Accordingly, a product can be designed for longevity to prolong a productôs life cycle. Moreover, a product can be designed for leasing/ service, which is important for business models such as fashion as a service. Alternatively, a product can be designed for material recovery (RSA, 2013, 4). The latter would be important for the current fast fashion business model, where mixing of different materials, unfortunate connections of components, or too many different materials used per product can make it costly or technologically difficult to salvage and then reprocess the raw materials. Design also decides on the choice of raw materials with some having a massive impact on the environment. An outstanding possibility to assess the benchmark of certain textile materials is the Higg Materials Sustainability Index (Higg MSI, n.d.). Even the sustainability of production processes is influenced at the design stage, when for example replacing solvent-based with water-based glues, as described in the case. Of course, the basis for designers to consider all that is a certain choice in and the availability of raw materials and technologies. Therefore, the development of novel or improved materials supports designers to create garments meeting the requirements of design for recycling or disassembly. However, when deploying novel materials one should always check first whether the technology is available to recycle them in an efficient way (Hazell, 2017, 2). This is, by the way, the basis for another business model of Lacy et al. Circular Supply-Chain (Lacy et al., 2015, 37), which is briefly explained in section 2.3. H&M should continue pursuing this approach by deploying more renewable or recyclable materials.

On the basis of H&Môs self-defined four pillars steps to follow are therefore the following: continue research and benchmarking of different materials as to their footprint and recyclability, continue research and development of recycling techniques, and focus heavily on the design stage. From the economic perspective, in which more action is necessary, H&M should negotiate dynamic prices for collected garments and think about to vertically integrate the other stages of the above depicted mixed loop supply chain. The reason behind that is to secure access to secondary materials of high quality at lower or more reliable prices than virgin resources for the future, as discussed in section 4.2.3. This could be achieved through an acquisition of the SOEX group. Other possibilities include employing the third form of Recovery & Recycling in production processes of H&Môs suppliers. It is the Zero Waste Operations model (Lacy et al., 2015, 55), briefly

described in the Methodology, chapter 3. With it the idea of Circular Economy could be further extended to the other stages of H&Môs value chain, which is also something Ellen MacArthur calls for in the above mentioned interview with H&M: to extend the circular concept to H&Môs wider operations (H&M, 2015, 91).

5.2 Vögele's Approach

5.2.1 Assessment

Based on the three UoA in the Vögele unit of study, and on the theoretical framework of the Recovery & Recycling model, Vögele and its ecosystem might look as depicted in Figure 18.

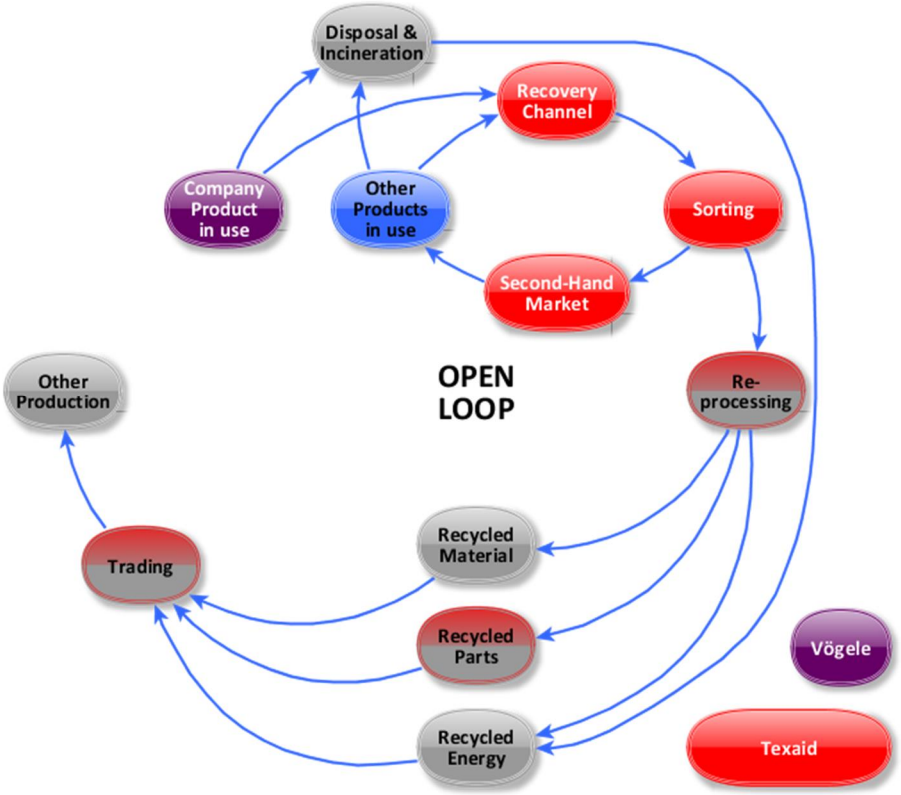

Figure 18: Vögele within an open loop supply chain (Adapted from Lacy et al., 2015, 54-55 & supplemented with information from own analysis)

Through the partnership with Texaid, Vögele can be said to play a very small part in the depicted open loop supply chain. It is open loop since Vögele accepts any clothes and because clothes are sold to Texaid. Texaid with its subsidiaries is at least partly active in the reprocessing and trading stages of this supply chain, namely with the recovery and trading of rags for industrial use, therefore, the half-red shaded stages. It was not possible to find out whether Texaid is also active in producing insulation material (recycled material). Yet, this is not a central aspect for this thesis.

The first part of the research question addresses decoupling from harmful resources or, the environmental perspective.

Vögele decouples from potentially harmful resources in a very limited way through using renewable energy and reducing operating waste at the sales stage and increasing the share of organic cotton at the design stage. The statement that they operate in a business that is *not* resource-intensive (Charles Vögele Switzerland, 2015, 26) is admittedly not wrong compared to the cement or steel industry, for example. However, by stating this Vögele tries to avoid its responsibility in the stages in between such as raw material production and manufacturing. That is rather shortsighted, considering the fact that their business would not exist without the intermediate stages between design and sales. Vögele has therefore not sufficiently decoupled its business from potentially harmful resources, especially when benchmarking with the UoS 1, H&M.

The second part of the research question addresses decoupling from scarce resources or, the economic perspective.

Solely collecting garments in-store in order to sell them to a service provider is not yet decoupling from an economic perspective as previously argued in the H&M assessment.

Overall, the performance of Vögele in sustainability matters is rather low. Most striking is the fact that, part five of Vögeleôs annual report ñEnvironmentò was copy-paste from 2014 to 2015.

5.2.2 Guidance for Vögele's Future

Companies such as Vögele that may not have the scale or financial possibilities to operate sustainability departments should at least try to leverage the know-how already generated within the industry or, with other words, stand on the shoulders of giants such as H&M. Consequently, companies like Vögele should use their limited resources to build on experiences that are freely available on the market or in the industry instead of trying to create something on their own. The Sustainable Apparel Coalition, for example, designed the Higg Index, a tool that is freely available. It is a product of collaboration lasting over several years containing a wide variety of self-assessment tools and can be downloaded by anyone (Sustainable Apparel Coalition, n.d.). This is just one example of the many possibilities available to embrace with comparably low resources on a sustainability strategy that is more than purchasing power from renewable sources. Finally, much can be done at the design stage. The importance of design is stressed throughout the review of the seven schools of thought in the beginning of this thesis. Moreover, and, as explained

in the H&M assessment, design is a prerequisite for efficient recycling. Smaller players arguably do have the capability to design for reuse and recycling, and are well advised to consider that.

6 Conclusion

Summary

The gap between the activities and efforts of the two units of study is considerable. Overall, decoupling from an environmental perspective seems to have succeeded more than decoupling from an economic perspective. The Swiss fashion retail industry can therefore not be said to have fully future-proofed its businesses in order to stay competitive in the future when prospectively prices of raw materials will increase due to rising demand and scarcity of input factors. Yet, many solutions, ideas and options to do business sustainably in the fashion industry are ready to be employed and others are yet to be discovered, with design having arguably the largest impact.

Limitations

A prerequisite of internal validity in the context of a case study research strategy is sufficient triangulation. According to Farquhar, triangularity is of variant types. Whereas data could be triangulated to a certain extent in this thesis, method triangulation is insufficient, as is triangulation of theoretical perspectives and investigator (2012, 44). That is, only qualitative methods were employed, the theoretical perspective was limited on the business model provided by Accenture, and there was solely one person interpreting the data where subjectivity can result in bias. However, Eisenhardt, an expert in this field, states that supplementing and enwrapping a case study with literature, contributes positively to internal validity (1989, 544), which was done in this thesis.

Further Research

The present thesis considered only the business model Recovery & Recycling. Yet, other possibilities to decouple oneôs business are possible. For example, Fashion as a Service, as seen at Mud Jeans, where one can lease a pair of jeans for 7.50 Euro per month (Mud Jeans, n.d.). Therefore, it would be interesting to find out through surveys whether Fashion as a Service might be an alternative for consumers within the Swiss fashion retail industry and whether it could be successful to pursue a pure or blended approach (Lacy et al., 2015, 120). Moreover, an analysis of Swiss legislation and policies might be helpful, and insight into whether they are supporting or driving businesses in transforming their business models from linear to circular ones.

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Appendix

1 H&M Sales per country – Orbis (n.d.-d)

GERMANY	3'573'669
UNITED STATES	2'744'310
UNITED KINGDOM	1'585'527
FRANCE	1'300'226
CHINA (PEOPLES REPUBLIC)	1'043'766
SWEDEN	873'941
ITALY	814'078
SPAIN	741'460
SWITZERLAND	728'131
NETHERLANDS	714'343
NORWAY	534'063
FRANCHISE	515'334
AUSTRIA	513'955
DENMARK	497'983
POLAND	407'211
CANADA	404'109
BELGIUM	400'202
JAPAN	399'398
RUSSIA	342'177
FINLAND	260'712
TURKEY	231'642
HONG KONG	214'866
ROMANIA	166'377
GREECE	153'049
SOUTH KOREA	133'401
HUNGARY	120'991
PORTUGAL	119'268
AUSTRALIA	118'349

CZECH REPUBLIC	114'787
MEXICO	108'697
MALAYSIA	107'663
SINGAPORE	104'101
IRELAND	99'275
CROATIA	75'146
PHILIPINES	57'106
SLOVAKIA	55'383
CHILE	55'383
SLOVENIA	49'752
BULGARIA	48'948
LUXEMBOURG	44'122
TAIWAN	36'309
SERBIA	30'449
ESTONIA	29'874
Latvia	29'415
Lithuania	28'151
PERU	25'623
MACAU	10'226
SOUTH AFRICA	9'882
INDIA	8'388
Sum of sales in th	**20'781'218**
Sum of sales	**20'781'218'000**
Sum of five biggest in th	**10'247'498**
% of sales of five biggest on total sales	**49.31%**

Table 3: H&M Sales per country (Retrieved from Orbis, n.d.-d)