

UNIVERSITY OF CANTERBURY

Moving Beyond Sustainability:  
To what extent does the Cradle  
to Cradle framework play a  
role within New Zealand's  
fashion industry?

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## ABSTRACT

Our planet is threatened by a rapidly changing climate, alarming resource depletion and a steadily rising population growth. This calls for intensified sustainable practices within businesses of all sizes and industries. In recent years this resulted in a wholly new model called the circular economy. Inherent to this is the Cradle to Cradle framework which seeks to design and create commodities in such a way that the impact on the environment, i.e. the carbon footprint is neutralised. Significant efforts are currently being undertaken in Europe and the United States in various sectors with a recent focus on transforming the fashion industry. The literature finds that there is generally still little known in this area, there was barely any evidence of this change taking in New Zealand. The objective of this research is to explore this and to eventually build a theoretical understanding to what extent Cradle to Cradle plays a role within the fashion industry. This was achieved by employing the grounded theory method. Data was collected by conducting semi-structured interviews with owners-managers supplemented by secondary data such as sustainability reports. In line with grounded theory principles, open and selective coding, theoretical sampling and constant comparison were used to analyse all data within the Nvivo 10 Software. The theory showed that somewhat severe resource constraints and an occurring loss of transparency by outsourcing manufacturing operations to overseas locations impede the shift towards the circular economy at present. This research contributes to sustainable development literature by providing a comprehensive model of how the uptake of sustainable practices is influenced and dependent on multiple aspects and therefore fosters the understanding of a complex, intertwined and intransparent industry. Furthermore, this research benefits companies and business networks alike.

## GLOSSARY

<b>BAU</b>	Business as Usual
<b>Coding</b>	The act of attaching concepts to data. These concepts are called codes.
<b>Constant comparison</b>	The act of comparing one piece of data you have attached a concept to with another piece of data you have attached the same concept to in order to see if it represents the same concept
<b>EC</b>	European Commission
<b>GOTS</b>	Global Organic Textile Standard
<b>MBIE</b>	Ministry of Business, Innovation and Employment
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>Open coding</b>	The first stage of coding in both strands of the grounded theory method. The data is examined line by line and codes attached to words or group of words
<b>SBC</b>	Sustainable Business Council
<b>SBN</b>	Sustainable Business Network
<b>Selective Coding</b>	The second stage of Coding in the Glaserian version of grounded theory. It is when open codes are grouped into higher categories, with the core category or categories in mind
<b>SMEs</b>	Small to medium sized entities
<b>Theoretical coding</b>	The third stage of coding in the Glaserian version of grounded theory. Relationships are built between categories, often using theoretical codes
<b>Theoretical memos</b>	Key tool for theorising. During coding, the researcher can break off to write down ideas they have about the codes they are working on
<b>Theoretical saturation</b>	Point in the coding when you find that no new codes occur in the data. There are mounting instances of the same codes, but no new ones.
<b>WBCSD</b>	World Business Council of Sustainable Development

## PREFACE

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### 1.1 Introduction to Cradle to Cradle

*“Tonight is not about hope, or promise, or vision — it is about reality. The companies embracing Cradle to Cradle® design and certification are proving that we can have a world abundant in health and resources; a world characterized by new expectations for what makes something high quality and beautiful.” - Susan Sarandon, Cradle to Cradle Innovation Celebration Event*

This event honours innovative and ambitious businesses incorporating a promising new concept that evolved a decade ago: Cradle to Cradle® (2013).

The current literature suggests that the earth’s environment is under constant threat (Doppelt, 2010; Ellen McArthur Foundation & McKinsey & Company, 2014; Lovins et al., 2014; OECD, 2012). Continuous increase of the common greenhouse gases carbon dioxide (CO<sub>2</sub>) and methane, rapid acidification of the oceans, deforestation and general depletion of our natural resources may result in devastating consequences for the global community if no government action is taken in the near future (Davis, Wilkinson, Fisher, Timberlake, & Horn, 2010). This view is supported by publications by other institutions such as the OECD and the World Business Council of Sustainable Development (WBCSD). It is argued that governments, business and consumers alike will be affected. Yet, these issues have not gone unnoticed, as countless sustainability agendas have emerged and gained popularity amongst all industries. Moreover, there is also a public expectation that the environment should be at the heart of a business’ operational processes.

These days, sustainability can manifest itself in many ways such as initiatives, agendas or specific reports as well as influencing and altering actual designing and manufacturing processes within a business. It led to emergence of a whole new discipline that we now refer to as sustainable development. As of 1997, there were 57 different definitions of this area accumulated by Susan Murcott for the annual AAS (American Association for the Advancement of Science) conference (Murcott, 1997).

The Cradle to Cradle framework has gained prominence in the area of how commodities are designed and manufactured.

## 1.2 Background of the Study

There are three terms that need a brief defining: Cradle to Cradle®, eco-effectiveness and the circular economy.

The concept originated in Europe and the United States after the German chemist Michael Braungart and the American architect William McDonough have met at the Earth Summit in the early 90's. A decade later and after intensive research (Hill, 2014), their publication "Cradle to cradle: Remaking the way we make things" was both considered a landmark and ground-breaking by many academics and experts in the field of sustainable development. In short, the Cradle to Cradle framework comprises a form of designing and producing goods in such a way that seeks to neutralise the impact on the earth's natural resources. As a consequence, the ultimate goal is to eliminate waste and design everything from the very beginning for constant reuse by choosing wholly regenerative materials (McDonough & Braungart, 2003).

Inherent to the Cradle to Cradle concept is eco-effectiveness, the counterpart of eco-efficiency, which is still the predominant manufacturing approach companies apply in product development and design. A linear business model fosters extracting and disposing of materials and products in a take-make-use-dispose manner (Hill, 2014) and ultimately aims at saving and reducing operating costs.

Linking Cradle to Cradle and eco-effectiveness leads to the embedding into the global context: the circular economy - a model mainly devised and heavily promoted (Hill, 2014) by the Ellen MacArthur Foundation. The model is defined as follows: "The circular economy refers to an industrial economy that is restorative by intention, [it] goes beyond the mechanics of production and consumption of goods and services, in the areas that it seeks to redefine" (Ellen McArthur Foundation, 2013a). Therefore the circular economy constitutes the precise counterpart of the old and well-established linear economy.

My own interest in this approach derives from my mother's family business - a manufacturer, designer and importer of soft toys - in Germany. After she met Dr. Braungart at a Design Fair in Coburg, the decision was made to adopt the Cradle to Cradle concept for one of the company's products: the educational soft toy Gustav. Admittedly, it took some time and money, but it resulted in the very first soft toy worldwide to receive the Cradle to Cradle certification. This sparked the idea as to whether there is room for New Zealand businesses to do the same. Conducting a preliminary literature review suggested that there is

barely any knowledge and awareness about Cradle to Cradle and the circular economy. Therefore, this provides ample reasons to conduct research where very little is known.

### 1.2.1 Research Objectives

This research project intends to explore sustainability practices in New Zealand's fashion industry and in particular to what extent Cradle to Cradle plays a role. The fashion industry consists of designers and manufacturers of garments, and the researcher seeks to examine current sustainability practices within this sector and their attitude to Cradle to Cradle. Sustainability is referred to as environmentally-friendly practices initiated by a company for the purposes of becoming a more sustainable organization (Willard, 2002).

Ultimately, this project aims at building an understanding of the attitudes that exist towards sustainability practises within the New Zealand fashion industry. Given the scope and context of a Master Thesis, one particular industry sector had to be selected. The Cradle To Cradle Products Innovation Institute's website was consulted for an up to date product registry in order to find out which companies currently work with the Cradle to Cradle framework and what kind of products resulted from the adoption. Standing out amidst all companies was the sports fashion manufacturer Puma. Genuinely convinced by their work, New Zealand's fashion industry was chosen.

Cradle to Cradle is still largely unknown in New Zealand, thus it is intended to use a relatively broadly formulated research question. It reads as follows:

*“Sustainability practices in New Zealand's fashion industry:  
To what extent does the Cradle to Cradle® concept play a role?”*

### 1.2.2 Research Approach

This research question calls for a qualitative research design. The desired outcome of this study is the creation of a theory therefore an inductive approach is needed. The methodology to develop the theory will be achieved by using the grounded theory approach, designed by Barney Glaser and Anselm Strauss in 1967. This methodology adopts an inductive process of 'discovering' theory from a 'constant comparison' process of simultaneously collecting data, coding and analysis. This methodology was chosen because little is known in the field of sustainability practices in New Zealand's fashion industry to this date as the literature review will show.

The theory will be built by conducting semi-structured interviews. In line with grounded principles theoretical sampling will be utilised. Cathy Urquhart cites Corbin and

Strauss in her account stating that the researcher must pick and “make use of procedures in ways that best suit him or her” (2013, p. 21). Additionally, given the nature of grounded theory the methods of data collection and analysis phases will remain flexible to alter as deemed necessary.

The grounded theory will be employed within a constructivist paradigm. It was found that constructivism suits the needs of my proposed research question and area of study the best. Working within this paradigm also means that the accounts of the renowned scholar in the area, Kathy Charmaz, will be followed.

### 1.2.3 Thesis Outline

**Chapter 1:** Introduction and background to the research project.

**Chapter 2:** The literature review will outline the current scientific landscape by first explicating the cradle to cradle concept, where the origins of it lie and to what extent it is discussed in the academic field. Taking it from there, C2C will be related into global context, New Zealand and why it can play a vital role within the fashion industry. Therefore demonstrating why the paradigm shift from the common linear to the circular economy is vital. Following that, challenges and benefits framework will be examined. The literature review will continue with several practical examples before benefits and challenges of adopting the circular economy will be presented. To conclude the identified research gaps and purpose are stated.

**Chapter 3:** The methodology section will briefly discuss the history of the grounded theory approach and where it is positioned within a qualitative research design. The chosen paradigm will be explained both ontological and epistemological angles are taken into consideration. The chapter ends with a description of the fundamental principles of grounded theory such as the coding process, constant comparison and memoing.

**Chapter 4:** This chapter will expound how the grounded theory was applied to this study. It will focus on how population selection and sampling proceeded, how the data was gathered, managed and analysed throughout the research process.

**Chapter 5:** This chapter will outline the major findings and compile preliminary results.

**Chapter 6:** This chapter presents the discussion of the results and how the research question was answered.

**Chapter 7:** Limitations and recommendations of the present study will be provided.

**Chapter 8:** This chapter will conclude this thesis.

# CONCEPTUAL FRAMEWORK

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## 2 LITERATURE REVIEW

### 2.1 Current Research in the Field

#### 2.1.1 Evolution of Cradle to Cradle

*“Our goal is a delightfully diverse, safe, healthy and just world, with clean air, water, soil and power - economically, equitably, ecologically and elegantly enjoyed” - William McDonough (TEDtalks, 2005)*

The inception of Cradle to Cradle® dates back to the Earth Summit in 1992 where Braungart and McDonough first met and developed the so-called “Hannover Principles” (McDonough & Braungart, 2013, p. 10), which served as a foundation for the concept. “At its core, [Cradle to Cradle is perceived as] the safe and productive process of nature’s ‘biological metabolism’ as a model for developing a ‘technical metabolism’ flow of industrial materials. Product components can be designed for continuous recovery and reutilization as biological and technical nutrients within these metabolisms” (McDonough Braungart Design Chemistry, 2014). Put simply the ultimate goal is to eliminate waste and design everything from the very beginning for constant reuse by choosing wholly regenerative materials (McDonough & Braungart, 2003). Therefore, when a product reaches the end of its ‘first’ life, the components are not discarded, but instead reused for something new without losing its former inherent value (Potting & Kroeze, 2010).

In practical terms, manufacturing will occur in such a way that no depletion or damage to the planet’s natural resources is caused. In essence the product inputs are wholly renewable and at the time the product is discarded it, is ideally fully recyclable.

It took ten years after the book “Remaking the way we make things” (McDonough & Braungart, 2002) was initially published, establish an accredited and independently reviewed version of the framework. Before then, it was left to a company’s own initiative to pursue Cradle to Cradle® and manufacture products according to the principles outlined in the framework. This resulted in a lack of credibility in the public eye, with criticism being raised that the framework was not transparent enough (Rossi, Charon, Wing, & Ewell, 2006). The authors acknowledged these criticisms in the second edition of the initial publication

(Braungart & McDonough, 2009). In addition, the Cradle To Cradle Products Innovation Institute was founded in 2011. The framework was assessed by independent organisations and all information required to gain certification is now readily accessible via the institute's website. The concept is currently undergoing its fourth revision (Cradle to Cradle Products Innovation Institute, 2014c).

At its core, Cradle to Cradle intends to minimise the impact on the world's natural resources. According to the authors this means that manufacturers and producers need to be more careful when sourcing materials. Manufacturers should consider to what extent these are reusable and how much and what kind of energy is used during the manufacturing process. Cradle to Cradle is not simply about minimising their footprint – being 'less bad' – but more so about being 'more good' (McDonough & Braungart, 2002, p. 45). These principles form the five categories of the Cradle to Cradle certification programme: Material Health, Material Reutilisation, Renewable Energy & Carbon Management, Water Stewardship and Social Fairness (Appendix A). Depending on the level of compliance, the product is awarded either a Basic, Bronze, Silver, Gold or Platinum certification (Cradle to Cradle Products Innovation Institute, 2011). To date, the Cradle to Cradle® framework is employed by a continuously growing number of companies worldwide, including Kiehl's, Procter & Gamble, FedEx, Nike and Puma. A complete list can be obtained from the respective online platforms (Cradle to Cradle Products Innovation Institute, 2014a; MBDC, 2015a).

### 2.1.2 Understanding Cradle to Cradle

The Cradle to Cradle framework emphasises the importance of two elements in particular: Firstly, the thinking in biological and technical metabolisms (Appendix B), or cycles, is promoted and secondly, the move towards eco-effective ways of manufacturing.

Every product consists of either biological or technological components. Identifying these in the design process can result in effective recycling or simple biodegradation (Braungart, McDonough, & Bollinger, 2007; McDonough & Braungart, 2002)

Eco-effectiveness describes the exact counterpart of eco-efficiency, which is also known and referred to as the cradle-to-grave model, a strictly linear fabrication system. Most companies adopt this model when producing goods. The process starts off by extracting materials, continues with the transforming into goods and is completed by the ultimate disposal of the goods. Working within the cradle-to-grave model therefore means "utilising eco-efficient techniques seek only to minimize the volume, velocity and toxicity of the

material flow system, but are incapable of altering its linear progression” (Braungart et al., 2007, p. 1337).

Minimising the volume can mean for instance, using less carbon dioxide or less of a common toxic chemical such as PVC (polyvinyl chloride). One can argue, using less of unhealthy ingredients is a good approach and a step in the right direction, however, it does not tackle the root of the problem - the linearity of manufacturing resulting in the waste of precious resources and contamination of the earth’s environment. The authors also label this technique as ‘less bad’.

This can be exemplified by the chair manufacturer Steelcase, who was challenged in either being ‘less bad’ or ‘more good’ (Braungart & McDonough, 2009). During the manufacturing process Steelcase was confronted with the problem of which chemical to use. On one hand there is PVC, a cheap component needing little energy yet poisonous and on the other hand, there is TPU (thermoplastic polyurethane), non-toxic but more energy consuming (Braungart & McDonough, 2009).

A ‘less bad’ advocate would suggest PVC because energy consumption would be reduced, however, the widely known toxicity would be readily accepted whereas Cradle to Cradle® proponents would advise the company to choose TPU instead. The managers at Steelcase discussed this issue at length, until their director spoke up declaring that, despite the higher energy cost, PVC would be banned permanently from the production process. The finished product - the Think Chair - proved to be the most successful chair the company ever fabricated (Steelcase Inc, 2014).

The cradle-to-grave model is furthermore characterised by intensive recycling. In this model goods are normally recycled where possible. However, a more precise term would be ‘downcycling’ (instead of recycling). Downcycling describes “the practice of recycling a material in such a way that most of its inherent value is degraded revealing poor design of a life cycle and the related material flows”(McDonough Braungart Design Chemistry, 2010, p. 9). This in turn leads to limited processing possibilities of the original material. Therefore the “linear, cradle-to-grave dynamic of materials within the economy [is maintained] (Ellen McArthur Foundation, 2013b) In contrast, eco-effectiveness “proposes the transformation of products and their associated material flows such that they form a supportive relationship with ecological systems and future economic growth (...) The goal is to generate cyclical, cradle-to-cradle ‘metabolisms’ that enable materials to maintain their status as resources and accumulate intelligence over time” (Ellen McArthur Foundation, 2013b, p. 28).

### 2.1.3 Cradle to Cradle in Academic Literature

Cradle to Cradle is a young discipline, but it does have its place in the wider context of sustainable development and the circular economy. The concept of the circular economy dates back to the late 1970s when the European Commission first started developing waste and resource management policies (Hill, 2014).

The initial version of the vision was devised by Walter Stahel and Genevieve Reday in a research project mandated by the EC in 1976 and published in 1981. Stahel and Reday had the idea of an economy in loops, mentioning the terms ‘closed loop’ and ‘cradle to cradle’ for the very first time (Stahel & Reday-Mulvey, 1981). In the wake of this a Swiss-born architect, Stahel founded the Product Life Institute in Geneva. His writings and work ‘created’ the Industrial Ecology discipline and influenced and sparked more research projects and initiatives such as the Cradle to Cradle book, the British based Green Alliance think tank and the Ellen MacArthur Foundation (Hill, 2014).



Illustration 1: key events in the circular economy debate

The circular economy itself can be seen as a part of the global sustainability movement. In periodic intervals a renewed focus on implementing meaningful action plans to reduce environmental pressures can be observed, normally in the lead up to a Conference of Sustainable Development by the United Nations (UNCSD, 2012). “Even though many countries including emerging economies, can point to impressive environmental improvement in the past two decades, the overriding global patterns of production,

consumption and trade remain dangerously unsustainable” (Preston, 2012). This unsustainable behaviour enhances the importance of the circular economy and the cradle to cradle framework. The Cradle to Cradle framework and the circular economy fit into the discipline of sustainable development, a “field (...) that has emerged to offset growing environmental degradation” (Doppelt, 2010, p. 33). However it cannot be claimed to have completely taken off yet. While considerable endeavours have been undertaken to foster more sustainable practices by a growing number of companies, others are merely starting to realise the potential (Doppelt, 2010).

The aforementioned groundwork in the field is “Cradle to Cradle: Remaking the way we make things”(2002), further supplemented by “The upcycle: Beyond sustainability - Designing for abundance” by Michael Braungart and William McDonough (2013). After receiving critical acclaim amongst practitioners and academia, Cradle to Cradle was critically discussed in several scientific publications. It has to be noted however, that due to the fact that Cradle to Cradle itself is still a relatively young scientific discipline there is no wide selection of academic literature available. Some articles focused on the exploration of the concept and how and where to implement it, i.e. reversing logistics across three industry sectors (Putnam & Kumar, 2008) or how to accomplish the transformation from linear to circular thinking in China (Zhijun & Nailing, 2007). Other authors dealt with the validity of some ideas in the initial publication such as the claim of biological nutrients being intrinsically good (Potting & Kroeze, 2010; Reijnders, 2008). One study tried to determine whether Cradle to Cradle could be a feasible alternative in New Zealand (Stephen, Judith, & Andrew, 2011). The interviewed scientists could not reach agreement as to whether the implementation of the framework is worth pursuing.

Cradle to Cradle has now found its way into the global economy. The concept was adopted and embraced by the World Business Council of Sustainable Development (Davis et al., 2010), and some national dependencies such as the Sustainable Business Council in New Zealand (Tomkins, Norton, Drury, & Ravlich, 2012), the World Economic Forum (WEF, 2013) and the Ellen MacArthur Foundation (2013a, 2013b; 2014; 2013) as well as the Organisation for Economic Cooperation and Development (Bibbee, 2011; OECD, 2011, 2012).

The search for appropriate literature extended to national government publications (Jenkin & Zari, 2009; Ministry of Business Innovation & Employment, 2014; Snow & Dickinson, 2000) and consultancies such as McKinsey & Company (Dobbs, Oppenheim, Thompson, Brinkman, & Zornes, 2011).

A valuable resource came from the Cradle to Cradle Products Innovation Institute itself, providing information and access to a constantly updated product registry and recently conducted case studies (Cradle to Cradle Products Innovation Institute, 2011a, 2011b; Trucost, 2014a; Vercoulen, 2014).

## 2.2 Context and Relevance of Cradle to Cradle

This section will present an overview of what has been achieved so far and what has yet to be achieved. First of all Cradle to Cradle is a central part of the so-called circular economy. The framework also attempts to provide a problem-solving approach to imminent and likely consequences largely caused by globally occurring climate change. The planet's changing climate currently has repercussions for resources, greenhouse gas emissions, freshwater and water treatment, oil depletion and deforestation. All of these aspects are of concern to the nations of the world, regardless of the size.

Findings of international studies will be presented and then related to New Zealand context and concluded by discussing the fashion industry context.

### 2.2.1 The Global Context

The Cradle to Cradle framework is an integral part of the circular economy, continuously gaining prominence worldwide, especially in North America and Europe (Ellen McArthur Foundation, n.d.).

A considerable number of prominent business people have come to realise that a change is needed. The outcome of this need is conveyed in a recent report published by the World Economic Forum in collaboration with McKinsey (2014) providing a framework towards a circular economy. The foreword of the report states: “Within the past decade (...) businesses have been hit by an increase in commodity prices that has effectively erased the (average) decline of the entire preceding century (...) this unprecedented rise in demand for a finite supply of resources calls into question our current predominantly linear economic system. The concept of the circular economy is rapidly capturing attention as a way of decoupling growth from resource constraints” (Ellen McArthur Foundation & McKinsey & Company, 2014, p. 3).

To substantiate the urgency to adapt to the circular economy, it proves very helpful to look at international organisations.

Firstly the world is still far from improving its performance concerning the reduction of emitting toxic gases (OECD, 2012). It suggests that without significant amendments in

government policies the concentration of greenhouse gases will have reached a level that makes it impossible to revert the global warming. Most scientists and institutions agree that the global temperature may not increase by more than 2°C by 2100. “There are a number of possible trajectories for reaching the 2°C target, [but] they all imply a reduction to zero of the net global greenhouse gas emissions in the second half of this century” (OECD, 2013, p. 7). These greenhouse gases are largely coming from what we produce and consume, ranging from fuel to all kinds of manufactured goods (Athalye, 2012). At this stage, the outlook is grim due to the fact that carbon intensity worldwide deteriorated significantly: “emissions increased faster than economic growth” (Tomkins et al., 2012). Furthermore, a prominent environment report has found that the levels of CO<sub>2</sub> reached a new all-time high in 2013 (World Meteorological Organisation, 2014).

Secondly, environmental degradation and resource depletion continues unabated. The ‘Vision 2050’ report published by the World Business Council of Sustainable Development (WBCSD) points out that the rapid exploitation of natural assets endures. This affects the most important ecosystems on earth and impacts negatively on dwindling supplies of fresh water and wood fibre (Davis et al., 2010). To this end, New Zealand needs to carefully consider future resource strategies, especially in terms of forestry and logging. The country may show the highest figure of protected forests among all OECD nations, but demands for the excellent wood products are rising. Exports to China alone increased tenfold within only three years from 2008-2011 and are likely to rise even more (Tomkins et al., 2012). Protection of conservation land and biodiversity may be compromised as a result.

The third major reason why a shift towards the circular economy is paramount is the earth’s population growth. It is estimated that by 2050 nine billion people will inhabit the planet and this in turn will exacerbate the resource shortages even more (Davis et al., 2010). New Zealand itself is predicted to have to support six million people by 2050 (Tomkins et al., 2012). The imminent risk of resource shortage however, is not the sole problem here.

Adding to that is that the world will see three billion more consumers joining the rising global middle class by 2030 totalling five billion people (Pezzini, 2012) “with almost 90% of the growth coming from the Asia-Pacific region” (Ellen McArthur Foundation, 2013b). This will lead to increasing buying power and higher domestic consumption.

The current rate of global consumption will result in almost 2.5 earths being needed to sustain worldwide demand by 2050 (Tomkins et al., 2012). This is presuming that no political action is taken by national governments in the near future and people continue ‘business as

usual' (BAU). If however the current BAU course can be amended and the guidelines from the WEF adapted, the course of the future can still be changed. The below illustration depicts this:

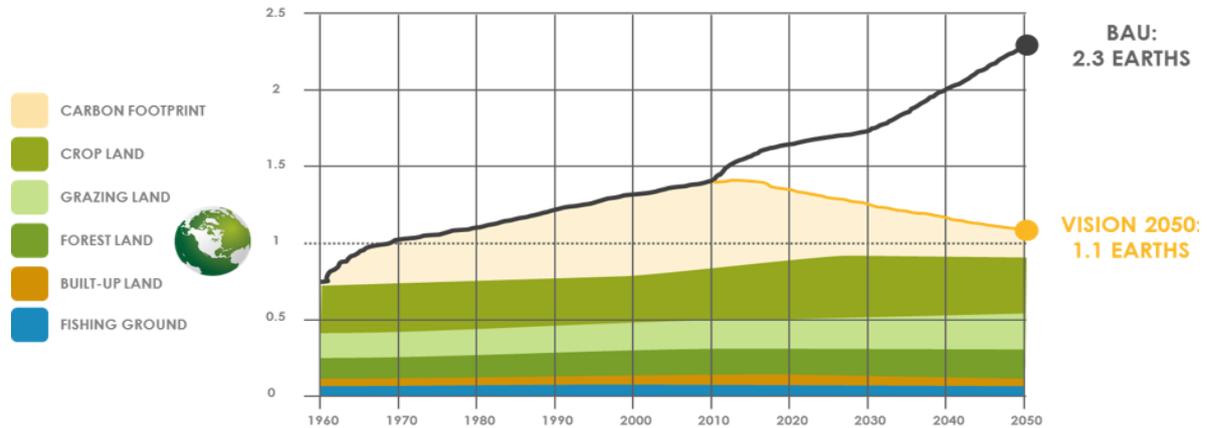


Illustration 2: Current trajectory 'business as usual' according to SBC

These reports argue for a rethink of the current agenda of the linear economy. Change is never easy and adapting to the circular economy certainly requires re-designing of business model processes, materials, products and services (Houten, 2014).

Therefore the Cradle to Cradle framework can be perceived as a means to achieve the transformation to a circular economy since the most important aspects such as 'greenhouse gas emissions', 'water quality and availability', 'biodiversity', 'renewable energy supply' and 'soil health' (Tomkins et al., 2012, p. 12) are addressed therein.

### 2.2.2 The New Zealand context

Eric Dorfman, a renowned ecologist from the University of Sydney, outlined major challenges of climate change and how it will affect New Zealand (Dorfman, 2008). The most pressing problem is the continuing rapid warming of the earth's atmosphere. For New Zealand, this will possibly result in an intensification and increased frequency and duration of already extreme weather patterns, such as severe floods and periodic droughts (Dorfman, 2008).

Also of concern are New Zealand's significant greenhouse gas emissions. Compared to other countries such as the United States, Germany and Norway, New Zealand's emissions, especially per capita, are relatively high (Austin et al., 2014). In 2008, the emissions equalled 7.8 tonnes per citizen (Malik, 2013) which is quite an alarming number,

given a landmass of 269,652 sq km and a population of approximately 4.4 million inhabitants (Statistics New Zealand, 2014). Bigger countries in terms of population such as Switzerland or Sweden ‘only’ emitted 5.3 tonnes per capita (Malik, 2013). However, it should be noted that New Zealand is a pioneer in the area of renewable energy sources. In 2013, 30% of all primary energy supply was derived from hydroelectricity or geothermal activity. In terms of electricity, three-quarters is generated by the same sources with a continuing demand over the past decades (MBIE, Modelling and Sector Trends, & Infrastructure and Resource Markets,

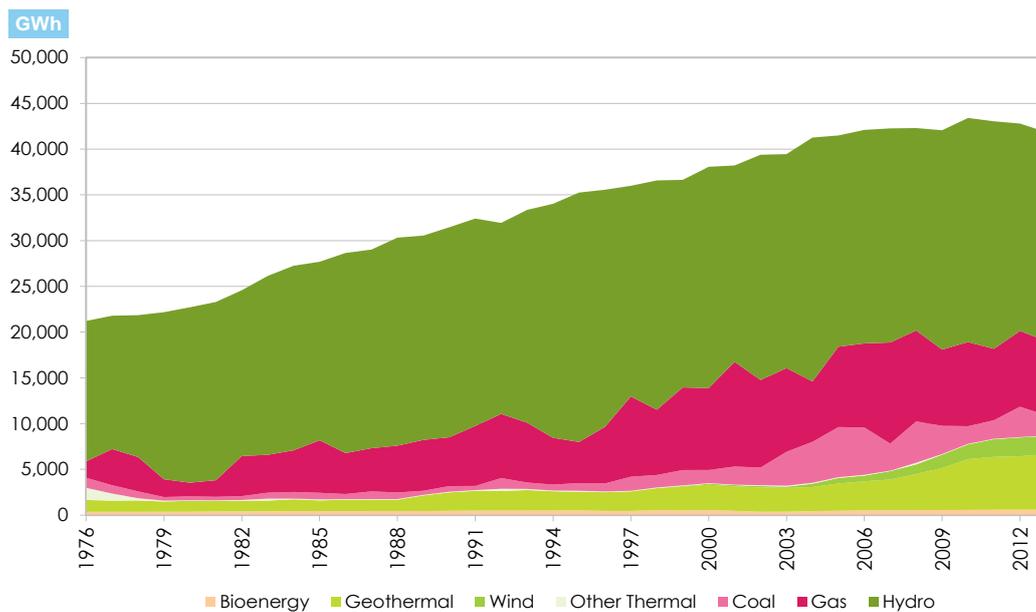


Illustration 3: New Zealand's annual electricity generation by fuel type (MBIE, 2014)

2014):

The government's goal is to increase the share of renewable energy by 2025 (Kelly, 2011). It is seen as ambitious but one benefit would be significantly reduced carbon emissions since electricity generated from gas creates approximately four times as many emissions (MBIE & Modelling and Sector Trends, 2013).

A report on Green Growth and Climate Change Policies in New Zealand published by OECD states that “New Zealand as a resource-based economy [is] anxious to protect its clean-and-green image [and] appropriately sees green growth as a natural direction for future development” (Bibbee, 2011, p. 2). The Royal Society of New Zealand agrees that there is plenty of potential to embrace the shift to a green economy and perceives this is advantageous (Austin et al., 2014)

In reviewing the academic and practical literature in New Zealand, four crucial documents were retrieved in relation to the circular economy and the Cradle to Cradle framework.

The first was “The End of Waste” provided by the Zero Waste New Zealand Trust (2000). It claims that merely a more efficient and improved management of waste is no longer sufficient and proposes a new approach focusing on “redesigning resource flows” (p. 3), which in this case is aimed predominantly at the elimination of waste. However, this report is currently under review, with a revised edition pending.

Secondly “Rethinking our built environments: Towards a sustainable future” was published by the Ministry for the Environment in 2009 and widely featured the Cradle to Cradle® framework along with some other restorative approaches. The publication argued that “current sustainability practices (...) which aim to do ‘less harm’ are insufficient to achieve a sustainable environment” (Jenkin & Zari, p. 7). The researchers concur with Braungart and McDonough that ‘doing less harm’ might be worthwhile in the short-term (Braungart et al., 2007), but that in the end it will not suffice and that the world is reliant on governments, institutions, business and societies to go beyond. The authors even suggest a time frame for implementing the new concepts (p. 35).

The third, is a study trying to examine the feasibility of Cradle to Cradle by conducting interviews with eight expert New Zealand scientists (Stephen et al., 2011). Results showed that only two of them were familiar with the concept and that the interviewees could not reach agreement as to whether the Cradle to Cradle framework is positive or negative balanced each other out (Stephen et al., 2011).

The last document was produced by New Zealand’s Sustainable Business Network (SBN). It is not strictly speaking a scientific publication, however the circular economy is addressed as an economic instrument to bring New Zealand forward and to realise new business opportunities across various sectors (Sustainable Business Network, 2014). The report made two statements regarding the country’s current status with regards to the circular economy. Firstly, that “it is fundamental that product design incorporates ‘circular’ thinking and avoids locking-in linear pathways from the outset” (2014, p. 20), which is very similar to the original Cradle to Cradle publication by Braungart and McDonough (2009; 2002). And secondly, that the “demand for circular solutions is not currently at a sufficient level to be a driver for many organisations to change existing linear offerings” (2014, p. 21). Additionally it was stated that at the moment there is no point to wait for the consumer actively demanding the change.

Aside from these documents a comprehensive study from Waikato University scholars examined the uptake of sustainability practices in New Zealand with a particular focus on SMEs (Collins, Lawrence, Pavlovich, & Ryan, 2007). It was reported that unsurprisingly the large businesses are more “actively engaged with sustainability [while one-third] of the sample cited the existence of barriers to adoption of sustainable practices” (2007, p. 729) It was also noted that SMEs are perceived as being compromised by a lack of expertise and resources as well as being pre-occupied with the compliance to existing government legislations (Collins et al., 2007).

It is apparent that New Zealand does need to change in order to be a green and sustainable economy (Austin et al., 2014; Doesburg, 2012; Jenkin & Zari, 2009; Snow & Dickinson, 2000). The national Sustainable Business Council and the Sustainable Business Network are heavily campaigning to realise the shift to the circular economy, still admitting that New Zealand is in its infancy. One of the eight expert scientists of the aforementioned feasibility study mentioned that “science is required to make this [change] happen, so business and consumers may then follow” (Stephen et al., 2011, p. 41). But since there is no unanimous agreement among scientists at this point as to whether this concept should be adopted and also no follow-up studies to be found, New Zealand retains its position as a relatively clean sheet (‘tabula rasa’) with regards to the circular economy and the Cradle to Cradle framework.

The work of the SBC and SBN is deemed crucial in the process since most of New Zealand’s businesses are classified as SMEs. Another country-specific study found that “owner-managers reportedly consider the environmental impact of their firm to be negligible” (Lewis & Cassells, 2010, p. 7) while simultaneously demanding more government action.

### **2.2.3 The Fashion Context**

Climate change, resource depletion and greenhouse gas emissions. How does this all apply to the fashion industry? This section will briefly outline the industry facts such as global revenues and trade statistics, while also considering predictions of worldwide demand of both fibres and apparel. Insights to raw materials and some common issues such as the use of toxicity in chemicals will be given as well. This will help clarify what the future holds in store and why the industry has to commit to more sustainable development.

Two organisations, the Forum of the Future and the Ethical Fashion Forum ‘Source’, are trying to raise awareness that the upcoming years hold many challenges for the industry.

These institutions also stress the consequences of the climate and demographic change and that every step and process, no matter where it is carried out, will be affected (Forum of the Future, 2010). “These profound changes will call into question the business models we are all familiar with” (Turner, 2012).

## 2.2.4 Industry Facts

The global fashion industry consists of textile, apparel and luxury goods with revenues generated by purchasing women’s, men’s and children’s clothing as well as footwear and luxury goods including the leather goods sector. Textiles refer to yarns, fabrics and non-apparel commodities. In 2011, world sales totalled at \$3,049.5 billion, and were projected to grow 4.2% annually by 2016 to approximately \$3,748 billion<sup>1</sup>.

In terms of trade, the World Trade Organisation reported a global stagnation in clothing and textile goods in 2012. As with the previous year China remains the leading country in exporting clothes and textiles, accounting for 33% and 38% respectively of total exports. The European Union and the United States maintain their positions as top importers with 58% of all goods imported. Due to its size as a nation New Zealand’s share is minute from a global perspective. In a local context, it is observed that imports of clothing increased tenfold over the past two decades. Exports in clothing merely



Table 1: New Zealand's clothing imports & exports, 1990-2012

tripled, even regressing by 9% in 2012 (World Trade Organisation, 2014). The same can be observed with regards to New Zealand’s textile sector. Imports have increased by 59% from 1990 to \$631 million. Exports show an overall increase of 87% to \$253 million in 2013, however, exports are declining notably since 2011 (World Trade Organisation, 2014).

Due to the aforementioned rapid expansion of the global population and the fast growing middle class, the demand for apparel is set to accelerate dramatically due to higher purchasing power as is demonstrated by the statistics portal Statista. Overall, the apparel

<sup>1</sup> It has to be noted that textile goods are valued at the manufacturer’s selling price whereas apparel is valued at retail selling price (ReportLinker, 2012)

industry is predicted to double in size by 2025 to approximately \$2,110 billion with major contributors coming from China and India (Statista, 2014).

### 2.2.5 Raw Materials

Raw materials used in the fashion and apparel industry can be classified into three categories. The first is natural fibres such as wool, cotton and silk. The second is so-called man-made fibres like viscose made from cellulose and the third is synthetic fibres like nylon, acrylic and polyester deriving from crude oil (Allwood, Laursen, Rodriguez, & Bocken, 2006).

According to the Lenzing Group, the leading manufacturer of man-made cellulose fibres, a total of 85.4 million tonnes was produced globally in 2013. Oil-based synthetic fibres account for more than 60% of the production volume, followed by cotton (30%), man-made cellulose fabrics (6.8%) and wool (1.3 %) (Lenzing AG, 2014). No country statistics are available for New Zealand.

### 2.2.6 Issues

One aspect of manufacturing garments remaining under investigation is the extensive use of chemicals. The Swedish Chemicals Agency recently found that there are more extremely toxic chemicals used in textile processing than the industry and public like to believe. Estimations suggest that approximately 3 kg of chemicals go into 1kg worth of cotton t-shirts, such as plasticisers, flame retardants or shrinking agents (KEMI, 2014). Across various steps of the manufacturing process 2000 chemicals are used and these can be released into the environment (Athalye, 2012). Most are known to be harmful to both human health and the planet's ecosystems, yet knowledge in general on this issue is considered to be alarmingly poor (KEMI, 2014).

Another area of importance concerns energy. Depending on what fibre is chosen the carbon footprint and energy use can vary considerably (Athalye, 2012) (see Table 1). Embodied Energy is the total energy used in the process of creating the fibre. For natural fibres this includes the planting and field operations, including irrigation and weed control, harvesting

Fibre	Energy in MJ/Kg of fibre
Cotton	55
Wool	63
Viscose	100
Polypropylene	115
Polyester	125
Acrylic	175
Nylon	250

Table 2: Embodied Energy used in production of various fibres

and yields (Athalye, 2012). It has to be noted, though, that whichever raw material is chosen, it will be a double-edged sword. Especially with regards to the cultivation of cotton, a natural fibre, there are severe problems, namely the utilisation of pesticides and fertilizers. “It is alarming that cotton, making up three per cent of global crops, is using 20 per cent of all agricultural pesticides and 22 per cent of insecticides” (Casey, 2008, p. 132). Additional factors concerning human health and social fairness constantly undercut sustainable development in the long-term (BCI, 2014).

Furthermore there are issues with the man-made fibres such as viscose which is derived from wood pulp. The non-profit organisation Canopy revealed that a third of the industry’s viscose comes from endangered forests in Indonesia, Brazil and Canada (McCullough, 2014).

It is not the fashion industry’s sole responsibility to strive for more sustainable behaviour. The consumers’ attitude is as important in terms of waste, since the consumer decides what happens to the garment once it is no longer desired. According to the US-based Council for Textile Recycling 5% of textiles go into the landfill with merely 15% of that amount being recycled. Moreover a US citizen discharges 70 pounds of clothes every year on average (Council for Textile Recycling, 2015). The percentage in Christchurch, for instance,

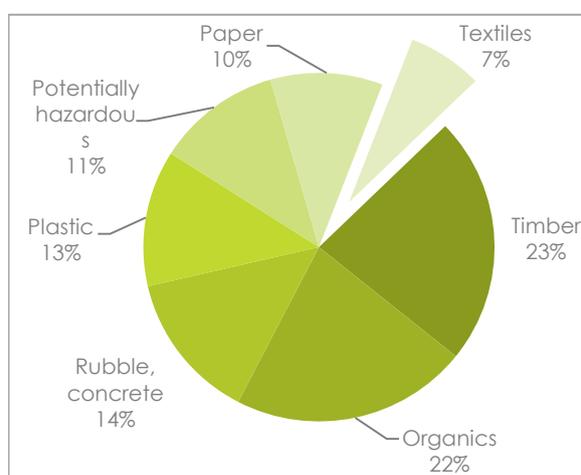


Illustration 4: Waste composition of a Christchurch landfill

is even higher with 7% of textiles occupying landfill space (Christchurch City Council, 2013). It can be argued that, compared to other materials such as timber, organics or plastic, this amount could be regarded as miniscule. However every piece of garment holds valuable materials which could have been reused otherwise. In this case, they are now irreversibly lost. To illustrate the composition of a typical New Zealand landfill, Christchurch was chosen because

there is no relatively recent data available for the country as a whole. The latest data dates back to 2004 (Statistics New Zealand, 2008). To discharge waste in general is a costly endeavour nowadays. According to the SBC the charges doubled over the past decade (2002).

It is also noted that the procedures of waste disposable currently employed need to be re-engineered with the ultimate goal of eliminating waste (2002).

The outlined issues on a global and national level and the predicted rise in global population (and therefore demand), amplify the need of new models and approaches to successfully manage the all these issues. Some organisations and business have already initialised the shift, demonstrating how the circular economy and the Cradle to Cradle framework can be actively incorporated. The most intriguing of these will be presented in the next section.

### 2.3 The Circular Economy in Practise

Due to the circular economy still being in its infancy in New Zealand (Sustainable Business Network, 2014), global examples from the fashion industry will be showcased instead.

One very recent initiative directly funded and supported by the Cradle to Cradle Products Innovations Institute called “Fashion Positive” launched in November 2014 (Cradle to Cradle Products Innovation Institute, 2014b). Designers and brands including Stella McCartney, G-Star RAW, Loomstate, Bionic Yarn, Belk, Maiyet and Saitex International now work in cooperation with the institute to ultimately create product lines according to the Cradle to Cradle framework by 2016. The first goal, however, is to establish a materials library, listing ethical suppliers and materials the partners can cooperate with (Adamczyk, 2014).

Many businesses internationally have introduced sustainability into their daily operating proceedings, having realised that “there is a big shift occurring” and that “the whole industry has awakened to the fact that it’s wasteful, there’s toxicity, low price points are driving human rights issues, wage issues (...) The whole industry knows it” (Adamczyk, 2014). According to the Cradle to Cradle framework, the sports fashion company Puma launched a whole new product line called InCycle (Puma Online Shop, 2014). Justin DeKosmosvszky, global strategy and programme manager, admitted that fulfilling and meeting the outlined criteria could not be accomplished in a simple and timely manner (Nemes, 2013). Nonetheless, the efforts are seemingly paying off and are well in line with the company’s sustainability aspirations. Dr. Reiner Hengstmann, the global director of Puma Safe, stated that “[the] InCycle product range (...), symbolizes an enormous step forward in the reduction of our and the consumer's carbon footprint, while at the same time offering

consumers a sustainable selection of products” (I:Collect AG, 2013). In addition, the pursuit of a circular model is economically viable for Puma. A ‘Product Environmental Profit and Loss Analysis’ proved that the biodegradable and reusable items like a pair of shoes and a classical shirt are cheaper to manufacture than their conventional counterparts (Puma, 2012). For all other products that are currently not designed according to Cradle to Cradle® framework, the company introduced recycling bins across all stores nationwide in Germany (PUMA, 2014). This initiative is called ‘Bring Me Back’. It aims at motivating customers to return clothes in a convenient way. Even non-Puma articles are accepted – after use (PUMA, 2014).

The North Face, an outdoor clothing manufacturer from the United States, launched a similar programme called ‘Clothes the Loop’, accepting every kind of garments. The claim is that “what matters is that the apparel is either reused or recycled for use in a variety of ways” (The North Face, 2014).

The first fashion company to introduce a garment collecting scheme was H&M, the globally recognised clothing manufacturer and retailer based in Sweden (H&M, 2014a). The catalyst for the start this programme was, that close to 95% “of the thousands of tonnes and textiles thrown away every year, could be re-worn or recycled” (H&M, 2014a). Karl-Johan Persson, CEO, states in the company’s annual “Conscious Actions” report that “H&M [has] set [itself] the challenge of ultimately making sustainable fashion and sustainability fashionable” (H&M, 2014b, p. 2). Over the past years, seven commitments have been developed, for instance “provide fashion for conscious consumers” (p. 3) or “use natural resources responsibly” (p. 3). These are constantly being improved and put into practice. This resulted in a ‘Conscious Collection’. Moreover, H&M can now provide meticulous details with regards to how, where and from what precisely a garment was made of (H&M, 2014b).

The small company dutchaWEARness, based in the Netherlands and founded by Rien Otto in 2012 demonstrates that even the base material - the fabric and fibres- can be created in a circular fashion. The founder was keen on “investigating how the cradle-to-cradle concept could be applied to the textiles industry” (Earley, 2014). Eventually this resulted in the creation of ‘Returnity’ – the first Cradle to Cradle® certified textile fabric. The company has since registered a showcase named EcoProFabrics with the Eco Innovation Scheme (European Commission, 2013), funded by the European Commission (EC). That way, the company tries to focus “on the up-scaling of production, distribution and exploitation of ‘Returnity work wear’ (...) which eliminates waste significantly and reduces pollution and the use of natural resources to a minimum” (Dutchawareness, n.d.).

These initiatives and companies exemplify clearly that pursuing and embracing the circular economy is perceived as a worthwhile effort despite it being time and resource intensive.

## 2.4 An Approach to Pursue

In concluding this literature review, essential benefits and challenges will be outlined. Finally the major arguments will be briefly discussed leading to the research gaps.

Implementing the Cradle to Cradle framework can be difficult. Some companies came to realise “that creating cradle-to-cradle products is truly a stretch goal [and that] it will take years to attain” (Rossi et al., 2006, p. 207). The framework has also been controversially debated, too. Lucas Reijnders from the University of Amsterdam disagrees with the statement of Braungart and McDonough that ‘healthy waste’ is good, meaning in this case the biological nutrients, which are seen as non-hazardous (2009). Reijnders argues that biodegradation may have also negative effects “due to increased emissions of ‘biological nutrients’ and the occurrence of hazardous substances in biological materials” (Reijnders, 2008, p. 1140). Therefore, nutrients should not be treated as intrinsically ‘good’. Some New Zealand scientist also found during the feasibility study that the process of degradation is insufficiently discussed in the Cradle to Cradle® framework (Stephen et al., 2011). The concept is also being considered “to be idealistic: a good idea in principle, but not in practice” (p. 39). It was also argued that “nature is not always perfect” (p. 44). Certainly, the scientists do have a point, but the environmental literature suggests that changes need to occur sooner rather than later, which is possibly why the New Zealand’s Sustainable Business Network decided to accelerate the shift to the circular economy by creating business opportunities for the economy (2014). The outlined criticisms in some articles are understandable – mainly the nonhazardousness of biological nutrients (Reijnders, 2008) – but the detailed chemical processes are not the major contribution of the whole concept, rather the way in “which [the authors] empower stakeholders to implement Cradle to Cradle® in their own practice. This is of crucial importance as policy makers, industry, and consumers are the carriers of sustainable change” (Potting & Kroeze, 2010, p. 9).

There are some benefits too. The Cradle To Cradle Product Innovations Institute recently published a comprehensive pilot study conducted with ten selected companies - including Puma amongst others - in order to test and refine the framework, but also to assess the outcomes of employing the Cradle to Cradle framework. The ultimate aim of the study was to uncover impacts for businesses, the society and the environment and the benefits that can be accrued (Trucost, 2014b) (see Illustration 5).

In the 2008 revised edition of the book “Remaking the way we make things” Braungart and McDonough (2009), the authors made some amendments to their original statements, including that the greatest success is achieved when the implementation is driven by the firm’s top management. Cradle to Cradle® is then not just applied to pilot projects but penetrates all goods and products (Braungart & McDonough, 2009). Puma, for instance, was awarded ‘Innovator of the Year’ and received plenty of positive feedback for its ‘InCycle’ products (Cradle to Cradle Products Innovation Institute, 2013).

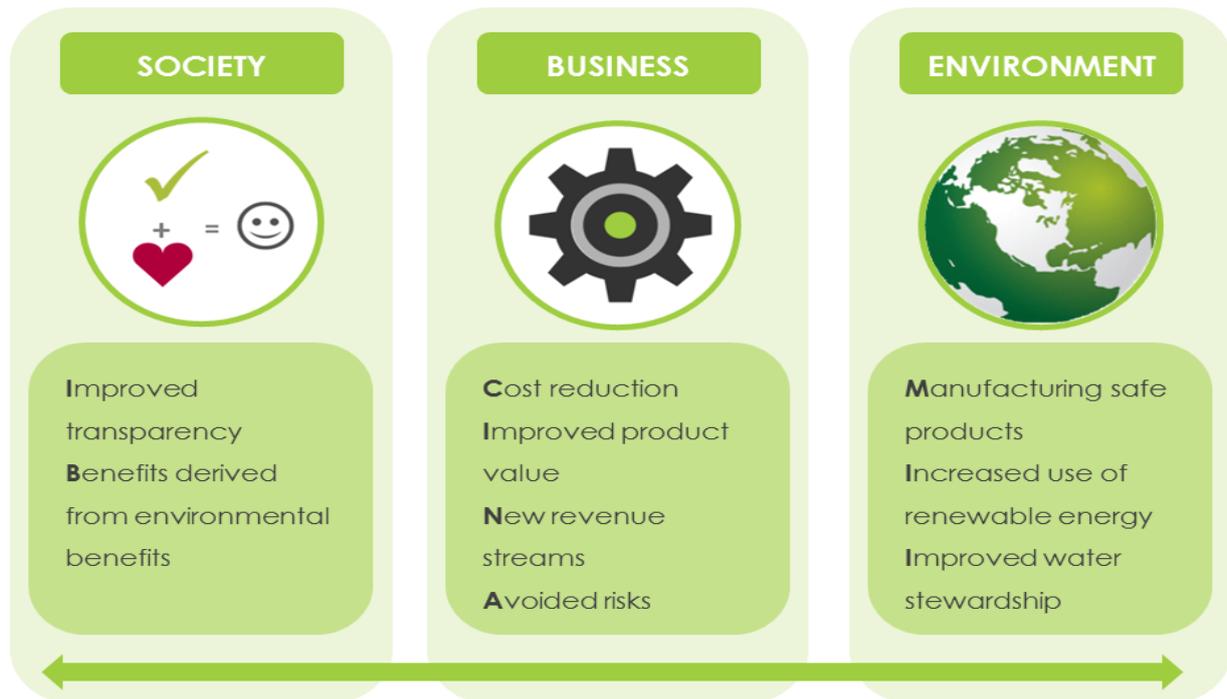


Illustration 5: Benefits of employing the C2C framework

Braungart and McDonough’s disapproval of eco-efficiency and ‘being less bad is no good’ overall makes sense, although one of the authors admits “while being eco-efficient may indeed reduce resource consumption (...) and provide temporary economic advantage in the short-term, it lacks a long-term vision for establishing a truly positive relationship between industry and nature” (Braungart et al., 2007, p. 1340). This view is supported by the World Economic Forum and the Ellen MacArthur Foundation as well as several researchers from New Zealand, who claim that “eco-efficiency is clearly valuable in the short-term (...) while other long-term strategies are developed” (Jenkin & Zari, 2009, p. 36). The outlined global and national problems provided a sound foundation and also clarified that society and industries alike are on the verge of a paradigm shift from an end-of-life to a closed-loop-thinking (Sustainable Business Network, 2014). Thus the framework can be seen as a valuable tool to achieve these ends – especially the interconnected aspects of ‘Material

Health’, ‘Renewable Energy’, ‘Material Reutilisation’, ‘Water Stewardship’ and ‘Social Fairness’. Still, the revolutionary approach is still in the early stages of its development (Ellen McArthur Foundation & McKinsey & Company, 2014), and even more so in New Zealand. Research suggests that the uptake of sustainable practices is difficult for New Zealand businesses. Reasons for that are, amongst others, the grand majority of companies are very small (Ministry of Economic Development, 2011). Furthermore, “many SME owner-managers consider the impact of their firm to be negligible or non-existent” (Lewis & Cassells, 2010, p. 7). A lack of resources, financially and with regard to human capital, also plays a vital role as well as insufficient time and a lacking demand by the consumer. As was demonstrated with Heunec (see introduction(2013)) and dutchaWEARness, the concept is also suitable for the smallest businesses, although advice and help by the big players is inevitably required. Michael Braungart emphasises “while this book makes it appear as if originally we wanted only big-company relationships, and although their scientists were usually people from whom we learned a lot, c2c is also the right agenda for small, inspired companies” (Braungart & McDonough, 2009, p. 10).

## 2.5 Research Gaps and Research Purpose

The literature revealed that there are considerable gaps with regards to the Cradle to Cradle framework and the circular economy in New Zealand. First of all only four academic publications were identified while reviewing the literature (Jenkin & Zari, 2009; Snow & Dickinson, 2000; Stephen et al., 2011; Sustainable Business Network, 2014). This suggests that New Zealand can be considered as uncharted territory and therefore provides ample reasons for in-depth research.

And secondly by embedding the Cradle to Cradle framework into the global context of the circular economy, it was apparent that New Zealand will be equally affected by the consequences of climate change, namely resource shortages, environmental and natural crises. The fact that the fashion industry itself is confronted with several of these issues - slowly leading to changing behaviour amongst businesses - reinforces the call for action. First steps have been taken in the global arena. Sustainability is now more than ever before on the business agenda, although it certainly still has to gain momentum, especially so in New Zealand. The call for action is made clear throughout the ‘Vision 2050’ report by New Zealand’s Sustainable Business Council (Tomkins et al., 2012), as well as the need for change by moving away from doing business as usual. The shift has to happen now, and

Cradle to Cradle and the circular economy can prove useful tools to achieve the goals outlined in the report in order to contribute to a future, where the projected six million New Zealanders (Tomkins et al., 2012, p. 7) can live and be sustained will within the limits of the country and the planet by 2050.

The purpose of this study therefore is to investigate sustainability practices in New Zealand's fashion industry with a preferred focus on the Cradle to Cradle framework.

## RESEARCH DESIGN

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### 3 METHODOLOGY

This section will expound on my qualitative research design and the grounded theory approach in greater detail. A definition will be given as well as brief insights into the history and relating controversies revolving around the methodology. The paradigm of choice, constructivism will be justified as it affected philosophical considerations. Some of the fundamental principles of the framework will be explained afterwards. The actual application of the grounded theory method will be presented in chapter 4.

The qualitative methodology of this study employed a grounded theory framework. It intended to explain to what extent sustainable business practices, in the form of Cradle to Cradle, play a role within New Zealand's fashion industry. There was very little known in this area of research at the time the literature review was conducted. In order to accumulate knowledge in an area that is still poorly understood, an inductive and innovative research approach was needed.

The grounded theory method was considered a ground-breaking publication (Glaser & Strauss, 1967) in revolutionary times of the 1960s. During this period the academic world was dominated by positivistic research where scholars “were trained to only test, not imitate. The book is a strong call to generate and ground theory and refocus on qualitative data rather than quantitative verification of theories” (Urquhart, 2013, p. 15). The limitations of deductions eventually resulted in the rise of qualitative research methods and the grounded theory method was accepted as an approach for theoretical discovery.

The sampling process within a qualitative research design differs significantly from its quantitative counterpart. In quantitative studies the sample is usually large and randomly gathered, drawing strength from the probability theory (Creswell, 2007), whereas “qualitative methods (...) engage in small in-depth samples where the power lies in the selection of information-rich case studies” (de Vries, 2007, p. 59).

Qualitative research can be a highly complex, tangled and intertwined field, because there are multiple terms, concepts and assumptions which can all be related amongst each other to a certain degree (Denzin & Lincoln, 2011). In the earliest version of the ‘Handbook of Qualitative Research’(1994), the definition reads: “Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that

qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena (...) it involves the studied use and collection of a variety of empirical materials - case study, personal experience, introspective, life story [or] interview[s] - that describe routine and problematic moments and meaning individuals' lives" (Denzin & Lincoln, 1994, p. 2). In the "Handbook of Emergent Methods", Kathy Charmaz, renowned for her constructionist version of the grounded theory framework, points out that grounded theory can be considered as an emergent method, which "[is] particularly well suited for studying uncharted, contingent, or dynamic phenomena" (Charmaz, 2008b, p. 155)

Hence, to examine an area where very little is known in the academic landscape, I chose the Grounded Theory Approach envisioned by Anselm Strauss and Barney Glaser (1967). The plan was to construct an inductive understanding of how, or if at all, Cradle to Cradle and/or the circular economy are of any importance to New Zealand's fashion businesses. It has to be noted that the process of building this understanding was affected by how "events [unfolded] and knowledge [accrued]" (Charmaz, 2008b, p. 155).

During the course of this line of inquiry, the goal was to remain true to the elementary principles, namely theoretical sampling, continuous collection and analysis of the data, constant comparison and theoretical saturation (Bryant & Charmaz, 2007; Goulding, 2005; Urquhart, 2013).

### 3.1 A Brief History of Grounded Theory

"The grounded theory method comprises a systematic, inductive, and comparative approach for conducting inquiry for the purpose of constructing theory. The method is designed to encourage researchers' persistent interaction with their data, while remaining constantly involved with their emerging analysis" (Bryant & Charmaz, 2007, p. 1). The name indicates that the "theory (...) is grounded in the words and actions of those under study" (Goulding, 2005, p. 296).

Since the discovery of grounded theory by Barney Glaser and Anselm Strauss (1967), there has been a considerable number of additions by the originators themselves. Most important amongst them 'Basics of Qualitative Research: Grounded theory procedures and techniques' (Strauss & Corbin, 1990) and 'Basics of Grounded Theory Analysis: Emergence vs. forcing' (Glaser, 1992). These follow up publications resulted in the creation of two prominent camps: the 'Glaserian' and the 'Straussian'.

The Glaserian version emphasised the importance of letting the data emerge while the Straussian version provides very schematic coding procedures that somewhat contradicts one of the key principles of the grounded theory method.

Scholars, academics and experts alike (Bryant & Charmaz, 2007; Eriksson & Kovalainen, 2008) agree that it is crucial to select one version and then to adhere closely to it in order to guarantee overall consistency. Some clarification on this divergence is given in an enlightening account provided by Karen Locke, who explicates that “reading the methodological treatises of both authors indicates that issues about method are tangled with issues about friendship, loyalty, and intellectual ownership (...) no differences between the two authors [can be found]” (Locke, 1996, p. 241) The accounts do differ, though, when it comes to the relationship between the researcher and the world under study.

### 3.2 Philosophical Considerations

To understand the application of grounded theory we must understand the various schemes that classify research paradigms. From what the literature suggests, I found the schema of Egon Guba and Yvonna Lincoln characterise a paradigm a “as a set of basic beliefs (...) [which] represent a worldview that defines (...) the nature of the ‘world’, the individual’s place in it, and the range of possible relationships to that and world and its parts” (1994, p. 107). A paradigm therefore creates a framework and helps to choose the appropriate tools, instruments, participants and methods that are employed in the study (Ponterotto, 2005). With regards to the grounded theory method, there are conflicting accounts in academia as to what the guiding paradigm should be (Bryant & Charmaz, 2007; Charmaz, 2006; Urquhart, 2013). Some scholars argue that grounded theory is positivistic, while more recent studies find it may be more constructivist due to the “realistic” nature of the theory (Charmaz, 2008a). The constructivist grounded theory can be considered as the newest version existing in the field, with Katy Charmaz being one of the forerunners. This version “retains the original focus on emergence but does so in relation to the conditions of the research and the standpoints and interactions of the researchers” (Charmaz, 2008b, p. 160).

For this study I selected constructivism as guiding paradigm because a “constructionist approach encourages innovation; researchers can develop new understandings and novel theoretical interpretations” (Charmaz, 2008a, p. 398). This understanding coincided with the intention of this research. Therefore the grounded theory approach within the constructivism paradigm was selected to answer the research question of

this study. Constructivism itself holds the belief that reality is constructed in the individual's mind and can therefore be seen as an alternative to the positivist paradigm (Ponterotto, 2005). Keeping these aspects in mind is crucial otherwise the consistency of the study could be undermined. Of course every researcher has to choose their own preferences. To this end Cathy Urquhart stated that the 'Glaserian strand offers more flexibility and is [also] closer to the original formulation' (Urquhart, 2013, p. 21). In addition the numerous accounts by Kathy Charmaz (Bryant & Charmaz, 2007; Charmaz, 2006, 2008a, 2008b) was followed.

The question of where to position grounded theory in terms of ontological and epistemological perspectives was rather hard to answer. Generally speaking ontology deals with the nature of being - the reality - and what there is to be known about a specific reality (Guba & Lincoln, 1994). Epistemology examines not only the reality as such but focuses on the relationship "between the knower (= research participant) and the would-be knower (= researcher) and what can be known?" (p. 108). There is no unanimous answer to this because depending on what the chosen paradigm is, the scope of these two philosophical perspectives varies. Within the constructivist paradigm, this means in terms of the ontological angle that "realities are apprehendable in the form of multiple, intangible constructions" and "local and specific in nature". With regards to the epistemological viewpoint this implies that "the investigator and the object of investigation are assumed to be interactively linked so that the "findings" are literally created as the investigation proceeds" (Guba & Lincoln, 1994, pp. 110-111). Normally, ontology and epistemology are clearly distinctive however, within a constructivist paradigm this distinction vanishes: "what can be known is inextricably intertwined with the interaction between a particular investigator and a particular object or group" (Guba & Lincoln, 1994, p. 110).

### 3.3 Principles of Grounded Theory

When using the grounded theory approach all researchers are confronted with a huge variety of data gathering methods. Observations and in-depth interviews are most commonly employed when it comes to using grounded theory (Goulding, 2002). Creswell also mentions that interviews are the typical method of accruing data to successfully achieve detail in the theory (Creswell, 2007). Glaser himself, however, notes that this is not limited to one method of data collection but can "combine and integrate them. It transcends specific data collection methods" (Glaser, 1978, p. 6). In addition to the most popular techniques one can also make use of introspection, life histories and secondary data and literature (Goulding, 2005).

Once the data is gathered, the coding process follows as a means to analyse. Analysing data within the grounded theory methodology involves coding, categorising and theorising (Goulding, 2002, 2005). Amongst these steps, the coding process is viewed as the most important one and is also referred to as conceptualising the data (Eriksson & Kovalainen, 2008). Generally speaking, the coding involves open, axial and selective coding. The data collecting process within grounded theory always goes hand in hand with data analysis.

These techniques are at all times accompanied by theoretical sampling and constant comparison - A unique feature that demarcates grounded theory from other qualitative research methodologies. Theoretical sampling “means in practice that the sampling of additional activities or events is directed by the evolving theoretical constructs” (Eriksson & Kovalainen, 2008, p. 11), which have come from previous coding. Constant comparison involves as the name suggests, the never ending “comparing [of] instances of data labelled in one category with other instances of data labelled for that category” (Urquhart, 2013, p. 17), i.e. constant data collection, coding and collecting more data.

An important contribution of the grounded theory framework is the concept of memoing, at times also referred to as ‘theoretical memoing’. This was discussed in greater depth by Barney Glaser, stressing this as the ‘bedrock of theory generation’ (Glaser, 1978). The advantage using the memoing technique facilitates a certain freedom for the researcher. Memoing actively encourages the researcher to take breaks from the coding process in order to allow creative musing about what actually happens with the data (Urquhart, 2013). Furthermore, this tool proves to be very helpful “to learn about the data rather than just summarizing material (...) Through this writing, the grounded theorist’s ideas emerge as discoveries unfold” (Charmaz, 2008b, p. 166). This is exactly what happened while collecting, coding and analysing the data for this study.

## 4 GROUNDED THEORY: APPLICATION OF THE METHODOLOGY

### 4.1 Sample Design and Recruitment of Participants

The following section will outline how the population for this research project was gathered and how the sample was built accordingly in the fashion of the grounded theory approach.

Given New Zealand's size as a country, its economy is relatively small compared to other G20 nations. This also applies to the manufacturing sector, especially in the fashion industry (Statistics New Zealand, 2014).

Several criteria were created to ensure the quality and appropriateness of prospective research participants. Generally speaking, participants would be both managers or owner-operators and designers involved in the process of creating and manufacturing fashion garments. This meant that non-manufacturing clothing retailers were not interviewed. The compilation of the sample commenced in August 2014, after approval of this postgraduate research project was granted by the University of Canterbury's Human Ethics Committee (Appendix C). Bearing in mind that response rates can be rather low, initial sampling targeted a considerable number of companies. It turned out to be a challenging endeavour.

In order to obtain a preliminary idea as to how many businesses there were in the designing and manufacturing sector, the online portal "Fashion NZ" (Fashion NZ, 2015) was consulted. After having skimmed through the directory and profiles of designers listed on the website, a random sample containing 27 New Zealand designers was created. As this website did not contain all designers and/or manufacturers, I sought the advice of a professor at my department at university, who is conducting extensive research in the fashion industry. She recommended "Fashion Design New Zealand" by Angela Lassig (Lassig, 2010). This comprehensive compendium", presenting 25 showcases of New Zealand fashion designers added to my sample. Approximately 50 businesses seemed like a decent number, so initial contact was made.

E-mails were sent, stating who I was and what the purpose of my research was requesting participation in the study (Appendix D). As expected, the response rate was very poor at first. The main reason for not wanting to participate in the study was the rapid approach of the new Spring and Christmas/Summer season. Therefore, most companies respectfully declined the request due to the busyness, although they expressed willingness to participate later if time permitted.

Thereafter, realising that the initial list would clearly not suffice for a sound sample, another search on the internet was undertaken. The search for companies was targeted at the broader industry, since the designer compendium (Lassig, 2010) and New Zealand fashion directories only enlisted businesses with a certain reputation or ones which entered showcases in such. During my stay in New Zealand, admittedly while traveling, I came across the merino and possum garments in several souvenir shops. I remembered this while pondering my online search and therefore started looking up terms such as ‘knitting businesses’ or ‘possum-merino’. Eventually more textile and garment manufacturers were obtained in exactly that area. Valuable input on whom to approach came from meetings with Katie Nimmo and Dr. Puck Algera of UC’s Sustainability Office, recommending companies in the Christchurch area. Adding to that - simply because I wanted a longer list - I also decided to establish contact with several of New Zealand’s outdoor clothing businesses.

The final sample list then comprised 60 businesses, all based in New Zealand, at least operating since 2011. Where there was no e-mail address available, more specifically only hotline numbers and online sales enquiry forms, Facebook and LinkedIn proved to be valuable tools to establish contact.

Overall sixteen of the sixty businesses replied to the research enquiry which accounts for a response rate of 27 %. In the end, eight of the approached businesses were willing to participate in one interview. The final sample consisted of two designers based in Christchurch, three knitwear businesses based in and around Auckland, one textile manufacturer in Wellington and one outdoor clothing manufacturer based in Christchurch.

## 4.2 Data Gathering

Interviews within the grounded theory methodology require careful consideration because there is currently no agreement on as to whether the researcher should enter the process of interviewing with or without preconceived ideas. Glaser (1992) states publication that “there is a need not to review any literature in the substantive area under study” (Glaser, p. 31). His concern is that the data gets constrained and contaminated and thus “the researcher should remain open in terms of the structure and direction of the interviews in order to let concepts [and categories] emerge rather than ‘forcing’ them into predefined categories” (Goulding, 2002, p. 108). As Karen Locke points out, the concept of gathering no prior knowledge actually leads to a contradiction of the original ‘Discovery of Grounded Theory’ (1967) account. In this publication, Strauss and Glaser stress that is very much a

possibility to “cultivate fruitful insights from many sources without compromising (...) the data” (Locke, 1996, p. 242). Furthermore, in addition to what is derived from the study, inquiries can be sparked by personal experiences or previously conceived ideas (Charmaz, 2008b).

Due to the simple fact that a literature review was already conducted to justify the project, it is no longer possible to actually enter the field without any knowledge. However, no preconceived concepts or categories were presented. Instead I intended to let the data, or rather the interviews, flow and see where it went.

In following Charmaz, “constructionists view the emergent nature of the method itself as arising from researchers’ questions, choices, and specific strategies and thus remain inseparable from their earlier and evolving perspectives” (Charmaz, 2008b). This is why I selected semi-structured interviews as the primary method. I did not want them to be too narrow, for I could have possibly missed out on something important that the interviewee deemed not necessary to say because the question was too specifically formulated.

In total the data comprises of eight conducted interviews lasting from 30 minutes to over an hour. In keeping with grounded theory principles all information is data, therefore two recently published sustainability reports of New Zealand business operating on a global scale added to the data pool (Kathmandu Holdings Ltd, 2014; Law, 2013). The primary data is further supplemented by online data from one of the leading merino clothing businesses (Icebreaker, 2014a, 2014b, 2015) and a small designing business based in Auckland (Conscious Cloth Ltd, n.d.).

### 4.3 Data Management

Concerning the management procedure of interviews, a few issues arose before the interview process commenced. These issues concerned mainly the location of the interviews and how to deal with potential sensitive data. Regarding the latter I decided in accordance with my supervisor to send each participant a transcript afterwards so that they had the possibility to remove certain things or simply to express their agreement. Before the interviews started I simply could not be certain how open my participants would answer the questions regarding Cradle to Cradle. In theory, my research area is not considered as a high-risk endeavour, so straightforward responses and insights were considered likely (Creswell, 2007). The face-to-face interviews took place in the participants’ premises. To conduct two interviews I travelled to Auckland since I was given the opportunity to visit the participants’

manufacturing plants. Before the interview started, I ensured that every participant received and signed a copy of the Information and Consent Sheet (Appendix E-F). Two other interviews were conducted on the phone, so I e-mailed these forms prior to our appointment. After this, the recording started.

Every interview was initially recorded on my personal mobile phone. After the completion of each interview the audio file was transferred onto my private and password protected computer and also saved online in an equally secured Microsoft OneDrive account. I created one folder for each company to have all the data in an orderly fashion and readily accessible. That applied to the conducted interviews as well as the sustainability reports and web sources. These folders and files cannot be accessed without having to use a password. In case that were to happen another password would be required to open the actual file in Microsoft Word. Furthermore all files were stored on the University of Canterbury's servers as a back-up and an additional external hard drive. For every interview I produced one transcript utilising the software "transcribe" to speed up the process where possible. This software provides practical rewind and slowing down features of the interview (Wreally Studios, 2014). All transcriptions were saved, handled and stored in the same manner as the audio files.

#### 4.4 Data Analysis Techniques

For processing the transcriptions and the other online materials the coding programme Nvivo 10 was employed. Open Coding constitutes the first step of the analysis. It includes breaking down, comparing and categorising the data. Within this initial step the goal was to identify recurring sentences, phrases or only simple key words. This was achieved by line-by-line analysis of each transcript. These were coded chronologically. Opening lines such as "How are you today?" and such were omitted in the line-by-line analysis. However I read through everything that was said in the respective interviews and coded everything that I deemed useful. For instance, the first codes included plenty of information about the history of the business, how it came to be, how the business developed over time and how it was faring. Even if this information did not seem directly relevant to sustainable practices, I decided to code it anyway. At this early stage, it was hard to tell if these codes would still be of relevance later on, so it was essential to analyse as much as possible. Depending on how carefully this step is carried out, the number of codes could vary from tens to a hundred (Eriksson & Kovalainen, 2008). ADD NUMBER OF CODES....

Essential during the coding procedure, was that all incidents were properly grouped and labelled and regularly checked by employing constant comparison. This meant “interview texts are analysed line by line, provisional themes noted, and subsequently compared with other transcripts in order to ensure consistency” (Goulding, 2002). After the coding was completed, the codes revealed that all information concerning the business itself can be split up into “Company Background” with several sub-categories and “Business Processes”. The latter category emerged after it became clear that the processes itself are necessary to understand the sustainable practices the company pursued.

Axial coding was not applied. There are yet again, controversial thoughts amongst how structured and rigid the coding process should be. Strauss and Corbin developed a complete coding matrix, prescribing every move that needs to be performed, which can be seen as forcing the data into predetermined concepts rather than letting the concepts emerge from the data (Glaser, 1992). Since I decided to go with Cathy Urquhart and Barney Glaser’s approach, axial coding was omitted. I continued the line-by-line analysis and started sorting the codes into themes as I progressed. For instance, with regards to sustainable practices the codes revealed soon that there are differences between what a business understands as sustainability, what the business currently does and what it is striving to do.

The below diagram exemplifies one of several categories and sub-categories falling into sustainability related codes and themes, creating a coding tree.

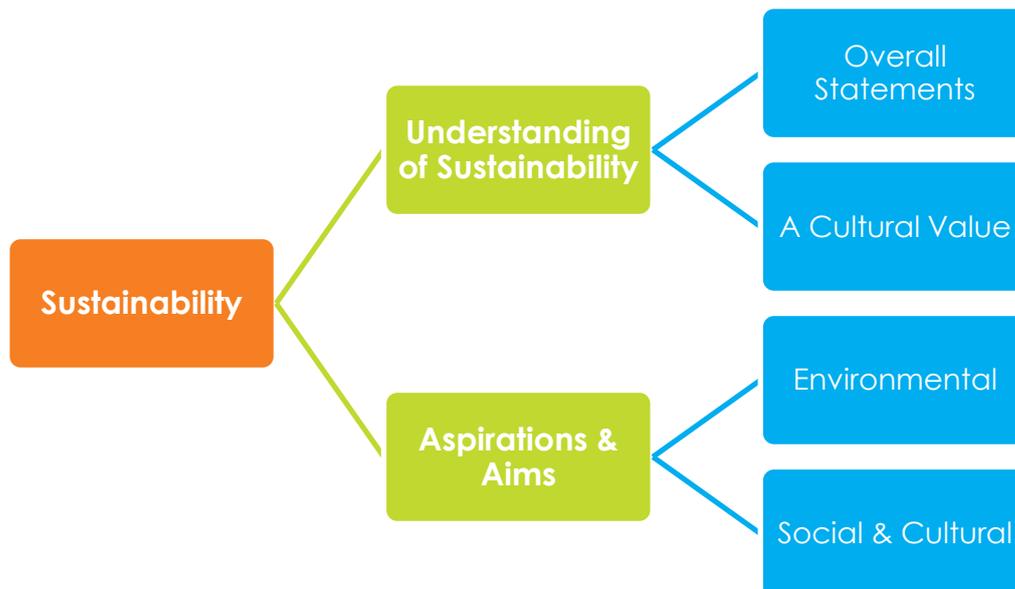


Illustration 6: Example of categories

Selective coding then refines and integrates the analysis towards a larger theoretical scheme. The researcher here has to choose one category that serves as the basic centre of the theory (Eriksson & Kovalainen, 2008). “In practice, while some key concepts emerge, most researchers find that because of the bottom-up nature of the coding, there is quite a lot of grouping to do at this stage” (Urquhart, 2013, p. 49). The coding is concluded by employing theoretical coding where simply put, the identified codes are related to each other. It is an interesting fact that this stage is apparently discarded by many scholars and academics who employ grounded theory, “but without relating the categories there is frankly speaking no theory at all (Urquhart, 2013, p. 49)”. Relating the categories helps to theorise and reveals connections and how certain categories influenced or depended on each other. Only by relating the categories, it was possible to understand every level of the theory.

#### 4.5 Ethical Considerations

This research did not intend to cause any harm to prospective interview participants. The area of research implies that there was no need to ask any personal questions whatsoever. The interviews focused on sustainability practices and Cradle to Cradle®. Sensitive or private matters will not play a role. The only was regarding commercial sensitivity. One participant declined for that reason, despite several attempts to reassure that the present study was completely confidential.

As outlined above, all gathered data was treated as highly confidential. All participating companies were dealt with in an entirely anonymous fashion, meaning their respective business names were not included in the write-up or otherwise mentioned in any other related contexts. Due to the guaranteed anonymity of persons and organisations, a low-risk approval form to the Human Ethics Committee of the University of Canterbury was submitted and approved on Aug 20, 2014 (Appendix A).

## ANALYSIS

### 5 FINDINGS & RESULTS

After the initial coding of all primary and secondary data was completed, and considerable amount of memos had accumulated it was found that all company related codes either related to the company background or to how the business manufactured their products. All other codes eventually resulted in the following major categories: ‘Fashion Industry NZ’ and ‘Sustainability’, each with several sub-categories which will be further explained and discussed in this chapter.

#### 5.1 Participants of the Study

The participants of the study were very diverse, operating in different sectors of the fashion industry. Participants 1-7 all have their main manufacturing operations in New Zealand, whereas Participant 8 and Participant 9 have their operations abroad, mainly based in Asia. Both designers and manufacturers also operate retailing facilities to varying extents. Designer1, for instance owns small retailing space in Christchurch’s city centre while Participant 8 maintains numerous stores across New Zealand and Australia. The below table provides an overview:

Name	Type	Staff	Since	Fashion sector
Participant 1	Designer-Retailer	0-5	2004	High Fashion
Participant 2	Designer-Retailer	0-5	2002	High Fashion
Participant 3	Designer-Retailer	0-5	1994	High Fashion
Participant 4	Manufacturer-Retailer	6-49	1990	Knitwear
Participant 5	Manufacturer-Retailer	6-49	1984	Knitwear
Participant 6	Manufacturer-Retailer	6-49	1967	Knitwear
Participant 7	Manufacturer-Retailer	50-99	1981	Knitwear
Participant 8	Manufacturer-Retailer	500+	1987	Outdoor
Participant 9	Manufacturer-Retailer	500+	1997	Outdoor

Table 3: Cluster of Participants

## 5.2 New Zealand's fashion industry today

During the interviews it was clarified that New Zealand's fashion industry consists of three major components: designers, manufacturers and retailers.

Insights were given that most national designers no longer manufacture locally, having moved overseas, predominantly to China. Several reasons for this shift were identified.

First of all, the free trade agreement between New Zealand and China facilitated imports and exports of goods so "that's when things totally changed". Secondly most Asian countries are "very competitive" with regards to pricing. This, even without the free trade agreement, facilitated the abandonment of New Zealand as a manufacturing location. It also severely diminished the textile and fabric industry. Basically the designer creates the looks and shapes in New Zealand and sources a factory overseas to have the fashion pieces produced. This may or may not involve the employment of traders, or so-called middlemen. Participant 9 voiced concerns in that matter:

*"Sweatshops, poor conditions and excessive pollution are often supported by traders who make their money by sourcing product at lowest cost and selling at a profit to companies who put their brand on it. The model is used by much of the apparel industry and it's wrong. We don't use middlemen like this because the cost is a loss of transparency. The real cost is the inability to tell good products from bad."*

The two designer respondents did not agree with this behaviour and "have chosen not to go there" (Participant 1). Moreover, their rationale was not to "compete against the cheap" out of principle stating they preferred "to make something that lasts instead of a cheap garment that hits the rubbish bin" (Participant 3).

The participants with businesses still manufacturing in New Zealand are mainly producing garments made out of possum fibre as well as merino lamb wool. The labour and cost advantages of having the stock made in Asia eventually lead to an industry distillation in New Zealand. Participant 4 explained it as follows:

*"In our industry, because of China and Bangladesh, India and the cheap labour, the industry distilled itself quite quickly into about four components:*

*One was possum-merino, one was merino...One was school wear and then there are a few guys who dabble in fashion.”*

Participant 5, for example started business by creating fashion for retailers such as Glassons, but when the pricing of their Asian counterparts continuously decreased they could no longer compete and therefore they needed to diversify. Luckily for them, the possum constituted a considerable threat to New Zealand’s native bush. It turned out that the possum fur makes an excellent raw fibre that could be blended with merino wool. Therefore, a unique and new industry was created with “a strong New Zealand story” (Participant 4).

The ‘China Factor’ not only resulted in this particular industry distillation and a call for diversification. Other consequences were the afore-mentioned diminishing fabric industry and intensified competition among the smallest businesses which generally found it very hard to compete with ‘Made in China’. This led to a “dying clothing trade, there is hardly anything here now and businesses have closed down” (Participant 1).

All participating businesses except for Participant 8, Participant 9 and Untouched World, admitted that business is rough. Statements ranged from it “it is very hard [to be a designer] and to “make here as well” and that most designers “struggle to survive”. And even the ones making in possum-merino admitted “it’s hard”.

However there is also an unwillingness to move overseas because it seems the likeliest logical option or simply because it is easy to “contact a company in China and they’ll do it for me”. The stories of the participants contained a certain level of gloominess, but although it is a tough business environment, participants demonstrated utter conviction that it is the right thing to operate as locally as possible.

### 5.3 About fabrics

Before moving onto the operating processes in greater detail, it is also important to know with what fabrics or fibres the participants predominantly work.

Participant 4, Participant 5 and Participant 7 mainly use the possum-merino fibre. This fibre is unique to New Zealand, but with a very high price point. A cone of this fibre costs approximately \$125. It is biodegradable by nature. The fibre was created after the possum populations continued to rise rapidly and therefore posed a severe threat to New Zealand’s fragile ecological systems. Thus, the possums are taken down by professional hunters and companies such as Woolyarns in Wellington spin a yarn out of it that is blended with merino wool. The fibre itself is very warm and is used to make garments and

accessories. The feel is very soft. Due to this and its position as upmarket product consumers tend to appreciate these kinds of garments more.

Then there is the wool of the merino lamb. Most traditional wool spinners in New Zealand succumbed to China's cheap working conditions. The very best wool is expensive. This may lead to the blending of the wool with other fibres such as viscose or nylon. Wool is probably the most sustainable fabric of all, however it is not always soft. The softness is dependent on the micron of the wool, the higher the micron the rougher the fibre feels.

Participant 6 once pondered investing in bamboo, since this plant "grows like weed". It is available in abundance. However, it does take a lot of energy to transform bamboo into an actual fabric.

*"They take the bamboo, they beat it, pound it, shred it and then it ends up nice and soft...So, although they say it is an eco-product, it's renewable and sustainable, they don't actually identify the transaction cost from bamboo to the soft fabric because it's so energy intensive" - Participant 4*

Viscose was also used. It is made by extracting wood pulp, therefore it can be debated whether viscose is actually a natural or rather a man-made fibre. Blending a yarn with viscose results in a "good feel" and makes the end product shiny.

Cotton was not overly discussed. It is of course a natural fibre, but as we have seen there are plenty of things awry. Extensive use of pesticides and insecticides is a great concern. Cotton cannot be grown in New Zealand, which is why it is imported.

Then there are the synthetic fibres like nylon, acrylic and polyester which are made from oil, it is technically plastic and very cheap.

Only Participant 9 and Participant 8 noted or actually clarified that the "most environmental damage is actually caused by the creation of the fabric". This indicates to me that there still is a huge gap in knowledge.

## 5.4 Manufacturing Process

The 'China Factor' led to two distinctive manufacturing processes: Either the businesses conducted all operations in New Zealand or shifted minor or major extents to an overseas location.

Participant 4, Participant 5 and Participant 7 all work within the possum-merino industry. They can easily retain their manufacturing processes within New Zealand due to all

raw materials being sourced locally and processed within the country.. These businesses can claim to be 100% New Zealand made.

As soon as one step of the manufacturing process happens overseas, several issues were identified. Before these issues are discussed, three different possibilities of how an overseas supply chain can be designed will be outlined.

Possibility 1: The business's raw material is sourced in New Zealand but each step thereafter is outsourced. This supply chain model is represented by Participant 9. The business sources the merino wool from exclusively contracted stations on the South Island of New Zealand. The wool is then processed by various partners:

*“Supply partners are centred around Shanghai but come from all around the world to be based there. It's a mini United Nations: we have partnered with a French wool blender, a German spinner, a Chinese textile house using Italian plant, a Japanese inspection service, a Chinese quality control company and a German logistics company”*

Possibility 2: The business receives the raw material in this case the dyed fabrics, but the laying, cutting and sewing takes place locally. The participating designers (1 & 2) fall into this model. The designers literally do not have another option available due to the aforementioned diminishing fabric industry. They normally employ a local machinist or spinner whenever they need something manufactured. Participant 6 can also be placed in this group. Whenever possible the company purchased merino wool from Australia that bears the Woolmark care label. Woolmark is “a safeguard, a registration that makes certain that we've bought the wool from a qualified supplier and spinner”. Should the price for wool become unaffordable other materials are acquired instead to create a mixed yarn. In this case, the Woolmark label cannot guarantee the safety and quality. Almost everything was made in New Zealand except for the garments which cannot be made in the country such as cotton shirts (Participant 6&7). It was also pointed out that the company should be importing from and making more overseas “because everyone else is”.

Possibility 3 is to have all manufacturing operations overseas. Participant 8 outsourced the whole process. In contrast, Participant 6 and Participant 7 only use that option for all fashion pieces made out of cotton. The reason for Participant 8 to do so is simply that “as a global brand, we have a global supply chain”.

The outsourcing of the production process, partly or almost completely, results in several issues. Manufacturing overseas implies a loss of control and transparency over what actually occurs in all the contractors' factories. It does not matter if the entity is a designer or an international outdoor clothing retailer. The loss of transparency is inevitable, thus the question is what the businesses can do to counter this issue.

## 5.5 Issues

The issue of how to retain control over a global supply chain while simultaneously ensuring transparency manifests itself in several other problems.

In dealing with these issues the size, reputation and influence of a business plays a role. Kathmandu, Untouched World and Icebreaker are globally recognised companies and they do have resources to ensure the goods are manufactured to their own high standards.

With regards to the 'compliance issue', Participant 8&9 deemed it essential to create shared values across all their suppliers. It is also considered important to treat all suppliers as long-term partners stating that "it's a relationship and we must share the same values and beliefs or it just won't work" (Participant 7).

These three have supplier agreements in place and audits are regularly conducted to ensure compliance with company's sustainable and ethical standards. Participant 8 pointed out that local laws and labour standards differ from country to country which is why it is crucial to demonstrate and exert full commitment.

*"We are committed to monitoring our supply chain to uphold environmental, health and safety, anti-corruption, fair labour practices, freedom of association, anti-discrimination standards and freedom from child and forced labour. Approximately 85% of our products were manufactured in China and sourced from 67 suppliers." - Participant 8*

Participant 8, however, also acknowledged that living by this commitment remains an ongoing challenge.

It was also found that the sole implementation of "Terms of Trade" or "Supplier Agreements" did not suffice. By regularly being on-site and thereby nurturing the relationship to the suppliers it was easier to maintain control of the process.

Icebreaker, for instance, also postulated that all contractors need to have or be "working towards a global quality assurance programme such as ISO" (Participant 9)

In contrast the participating designers (1&3) as well as Participant 6 to an extent, simply do not have such resources at their disposal to ensure that the fabrics and cotton shirts are manufactured in a sustainable fashion.

The ‘compliance issue’ is not the only issue though. All participating businesses undertaking operations abroad, whether it is the manufacturing or the sole importing of the fabric, are especially confronted with the issues of ‘Out of China’ and ‘Middlemen’ and ‘Green Washing Issues’. Table 3 provides an overview:

<b>DIFFICULTIES UPHOLDING PRACTICES</b>			
<b>... WHEN MANUFACTURING ABROAD</b>			
<b>Traceability Issue</b>	<b>Greenwashing Issue</b>	<b>China Issue</b>	<b>Compliance Issue</b>
Ongoing challenge	Likelihood to go green	Cheapness of labour	Enforcing audits and quality assurance
Needs strong competence	Out of China problem	Consequences for businesses	Human Rights abidance in supply chain
<b>...WHEN MANUFACTURING AT HOME</b>			
<b>Energy Issue</b>	<b>Knowledge Issue</b>	<b>Resource Constraint Issue</b>	<b>Local Manufacturing Issue</b>
Energy source indifference	As in material sourcing	As of money	Tough times manufacturing locally
Possibility of fusion energy	As in recycling	As of time	Lacking industry
Value beats renewable energy source	As in textile dyeing	As of being small-sized	Expensiveness of manufacturing locally

Table 4: Example of selective codes

It is becoming clear that the consequences of overseas manufacturing and its consequences were not only a factor/problem for New Zealand’s fashion industry. It did impact most (participating) businesses to some extent. Ever since companies took advantage of the favourable production costs abroad, another phenomenon found its way into the

industry: The problem of green-washing. This is considered to be “an area open to interpretation (...) that happens in the industry”.

The locally operating businesses, mainly Participants 4, 5 and 7, also faced numerous issues. These issues were of a different nature since the local manufacturing does not result in a loss of control and transparency. Therefore, the problems concerning ‘Traceability’, ‘Compliance’, ‘Greenwashing’ and ‘Out of China’ did not apply to them.

The most important and most frequently coded concept involved ‘Resource Constraints’, which were subdivided into time and money constraints. These constraints, especially with regards to time, denoted a significant area of concern for the participating businesses (Participants 1, 2, 3, 4 and 5). Although the time shortage was not really perceived as a problem, it was more described as a result of “being very hands-on” to keep the company running profitably.

This suggests that the daily business is so time consuming to the extent that it is not possible to take on big projects. There was not even time to plan these things, which is why “common sense” is used. These businesses were constantly subjected to time constraints as to where actually the available time should be spent. This is what prevents them from taking the big leap to becoming an even more sustainable operation by adopting the circular economy.

Financial constraints intensified this issue even further. For them, it was essential to “just be realistic and keep the business operating, profitably (...) [it has] to be a viable business”. Should these businesses be confronted with taking on a big project, for instance developing a Cradle to Cradle product, they would likely be forced to outsource this because they cannot afford one of their staff to dedicate plenty of time in such a project:

*“A big project like that would be someone else. And that someone else might be better spent doing lean manufacturing, which is improving the manufacturing processes, so that we are more productive and we then waste less”.*

This statement by Participant 4 stresses the dilemma and also highlights that a minimising approach, i.e. less waste, is prioritised on the business agenda.

From what was covered in the interviews, the willingness to be more sustainable is definitely there. If it was not the time shortage, then certainly the budget constraints impose a limit as to what the businesses can achieve aside from keeping the business operating. Participant 5 mentioned that “in an ideal world it would be great to do beautiful videos and

have the time and resources and put the money in that kind of thing (...) [but] we are too busy making products and do the best we can”.

Another issue concerned knowledge about material sourcing, textile dyeing and recycling opportunities. In particular the participating designers, who have to source their fabrics from outside New Zealand, are confronted with this. When fabrics were imported from overseas, it was reported that there was no way of finding out about where these were fabricated: “I think, it’s just a bit from all around the world, really (...) but I have no idea where it’s made”. Thus, a sole designer does not have any options available to trace the raw material. The fabric could have been created in a sustainable fashion or it could have been manufactured in questionable circumstances.

There is a considerable knowledge gap when it comes to the textile dyeing process. As mentioned in the literature review the dyeing involves numerous chemicals and is a matter of great concern. As with the fabrics, the participants reported that they either did not know about it since they received the fibres dyed anyway or they did not bother to ask the supplier responsible for the dyeing. Even the locally producing businesses (i.e. Participant 4, Participant 5) needed to deal with how the possum yarn is dyed since that is done by the supplying company in Wellington. Participant 5 admitted that they never inquired how the yarn was dyed, however, it was mentioned they were certain that chemicals are being used because the possum fibre is very dark and it is quite hard to absorb any colours. Participant 4 pointed out that there are no hazardous chemicals or bleaching utilised in the process “because it’s done in New Zealand”. This may imply that there is a strong belief there, that NZ businesses in general are doing business the right way due to the green image the country enjoys from a global perspective. In my opinion, this is a rather bold assumption.

It was clarified that the location of the manufacturing operations results in a number of issues. These issues impact the way the participating businesses incorporated sustainable practices. The designed flow chart illustrates how the issues, the manufacturing process and the ‘China Factor’ all related and mutually influence each other (Illustration 7).

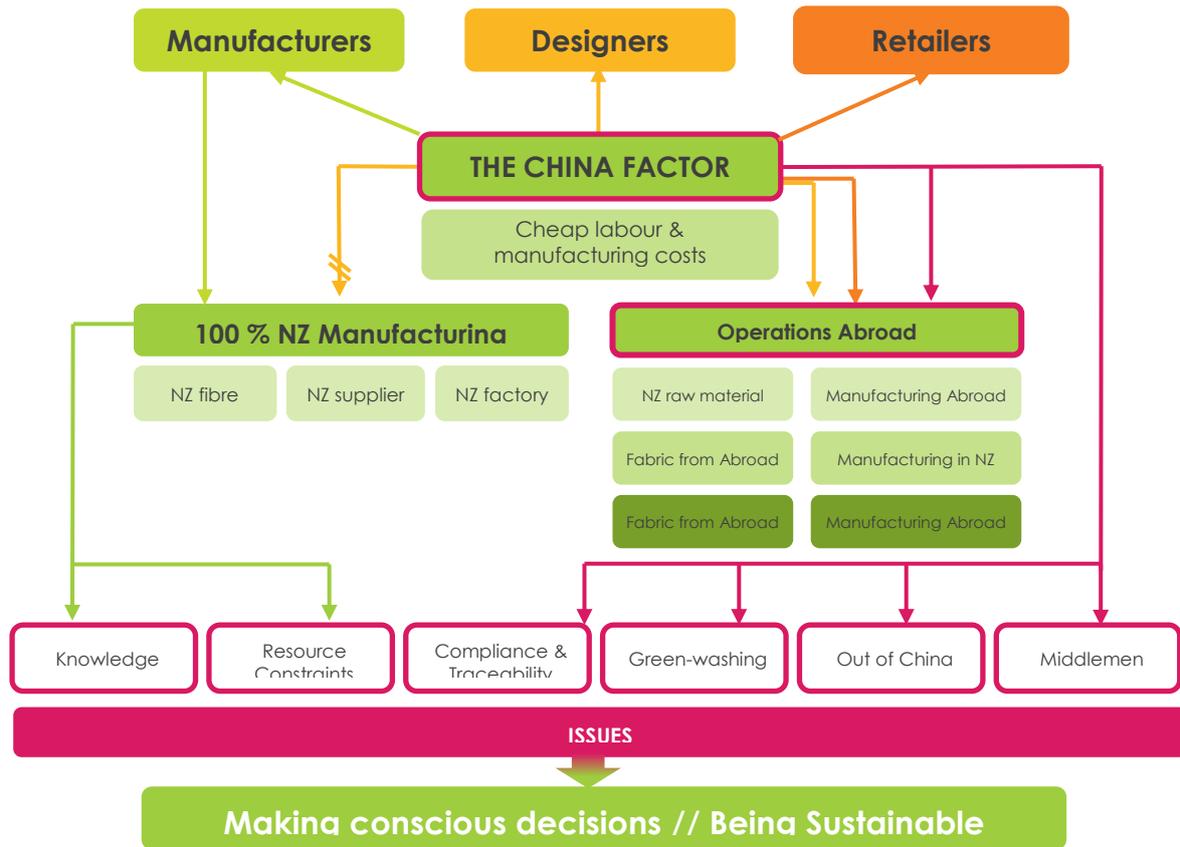


Illustration 7: Category & theme relations

## 5.6 Sustainable practices implemented

The codes filed under ‘Sustainable Practices Implemented’ resulted in two major sub-categories.

Category 1 considered the ‘Importance of Sustainable Development’ throughout the business. It outlined that most participants consider the total impact of their business, i.e. stating that the business cares “about all aspects of the design from intention through to the production and the delivery of timeless objects” (Participant 2) or stressing the fact that “sustainability is about transparency and being able to show the whole design of the business which starts with growers and continues through every step of the supply chain” (Participant 9). Participant 7 took this thinking even further:

*“The total life impact of what we produce, from the sustainability grown fibre we use, to our GOTS certified organic dyes and water based prints, right through to how our team dispose of their banana skins after lunch.”*

This shows that it is not only about having an overall approach about reducing a company's environmental impact but also that the small things do matter as well – how employees and also the consumer can influence sustainable behaviour.

Along the lines of the “banana skins” Participant 4 emphasised that in their business food scraps are given to an employee who can use that to feed chickens and shredded paper is sent to a local pet shop for the bunnies to live in. It may not have a huge impact, but that is something rather special and creative when it comes to dealing with wastage.

Since the above mentioned issues prevent the businesses from becoming a more sustainable organisation, the coding revealed that it eventually all comes down to making conscious decisions. These are framed under Category 2 ‘Making Conscious Decisions’.

First of all, and this was a great concern for all, it is generally aimed at operating responsibly (sub-category 1) within New Zealand. Aspects of this included ‘clean conscience’, ‘keeping NZ alive’, ‘making lasting designs’ and ‘taking the small steps’. These aspects only applied if there were no considerable global operations. It was deemed essential to have “a clean conscience”, ensuring to maintain the business within New Zealand even if that resulted in having higher costs and harder times personally: “But I’d rather do that and have less for me” (Participant 3).

By being responsible significant efforts were carried out to keep the fashion industry going within the country, even if it is only by undertaking small projects. Participant 1 explained that she is very fond of handmade pieces and so she decided to create woollen scarves which are woven in cooperation with the last commercial weavers in New Zealand. These pieces will constitute the commercial side of the designer store trying “to grow that little industry”, although admitting in the same sentence:

*“It’s so hard...because there is not much money to be made in the hand-made due [the] many hours...so the profit margin will be small but I’ll have the woven scarves and they are made in New Zealand”.*

Operating responsibly also meant creating garments that last in order to eventually slow down the fast fashion phenomenon. If something was designed in a timeless fashion as well as “beautifully crafted” (Participant 2) the customer may be inclined to keep the garment instead of discarding it at the end of the season.

On that note it was found that the consumer can exert substantial influence on businesses and there is an ongoing debate as how to cope with that. Participant 3 claimed that

she would “rather make something that lasts instead of a cheap garment that hits the rubbish bin”. This indicates a certain willingness not to be dictated by this debate, instead continuing to ‘make lasting designs’.

The second sub-category in the ‘Making Conscious Decisions’ theme included codes describing the ‘careful handling of waste’. As was shown in the literature review, waste is an issue of great concern in the fashion industry, especially with regards to cutting waste. This particular area was intensively discussed during the interviews. Oftentimes the cutting waste “is going to the dump” (Participant 3). When Participant 3 was asked whether that was something that simply could not be avoided the response was that “there is nothing you can do about it”. This fortunately, was not quite true. There were plenty of innovative approaches.

Participant 4 expounded that knitting used to create extensive amounts of cutting waste since “knitting used to be a ribboning fabric like weaving...You would knit a big ribbon, lay it on a table and cut it into a shape”. However over the past years the technology developed notably, so that now these knitting businesses (Participant 4-6) use machines that are able to knit a whole garment. The continuous knitting resulted in no seems and therefore no waste. The only waste when employing whole garment knitting was the knitting foundation, the draw thread, simply because “you have to knit off a base. The machine creates a couple of rows of foundations for the garment (...) and that is all that hits the bin”. I could witness this process myself during the second interview with Participant 4 as I was invited to visit the factory while conducting the first interview.

Then there was the possibility to transform the off-cuts into a new yarn. Participant 5 said that they have been “piling off-cuts for years, tons of it”, refusing to just landfill these instead waiting for an opportunity. So, now all the “off-cuts from the fabric (...) gets recycled into a different blend of yarn” (Participant 5) that is being used to design a new range of garments. And that is “working really well and it’s also nice to know that we are not just throwing it into the landfill”. Another option pursued by Participant 6 is something called “second generation wool” where the wool parts are pounded and re-engineered into cheaper wool.

Other than that Participant 1 explained she was careful when laying the patterns process in order to minimise the amount of cutting waste. Depending on the size of the off-cuts these could be utilized to make smaller unique one-offs. Also, some businesses constantly evaluated other recycling possibilities.

Of course the cutting waste was only one side of the story. There was a lot of ‘general waste’ and ‘packaging waste’ as well. Most participants aimed to minimise wastage as much

as they could, to try and prevent things being sent to a landfill. Participant 8 though had to report, that 25% of the accumulated waste was dumped, the majority of that waste being soft plastics. With regards to packaging it was noted that all participants were recycling their cardboard while at the same time trying to reduce the overall packaging of a product. The larger sized companies managed to only use cardboard for packaging that is certified by the Forest Steward Council (FSC) assuring the sustainable and environmentally-friendly sourcing of wood. Participant 7 also announced the successful implementation of a “dry waste recovery system at manufacturing and retail sites that reduces 85% of the waste sent to a landfill”. Aside from that it was also stated that merino wool is being fully recycled by textile recovery.

The third sub-category consisted of ‘creative recycling possibilities’. Along the lines of “doing the small things”, it was found that Participant 4 made good use of their wooden pallets which are needed for shipping the goods. Some of them are given to neighbours or other business to utilise while broken ones can be used as firewood.

Sub-category 4 was ‘Using raw materials’. It examined what kinds of materials were of preference. It was noted that most participants opted for natural fibres. Usually, this tended to be the possum-merino fibre, pure merino lamb wool, cotton or silk. Occasionally, the price came into play and then the raw materials became unaffordable. This concerned especially wool since that is normally auctioned, therefore other “cheaper” materials had to be purchased instead to create a mixed blend, for instance wool, nylon and viscose. Among the participating businesses only Participant 6 was affected by this. Natural fibres were also preferred because of the special feel. It was stated that “you can feel the difference (...) one is an oil product (i.e. polyester), it’s plastic, and the other is a natural product” (Participant 4) and that “it has character” (Participant 1). The downside however was that these fibres tend to come with a bigger price tag, apart from perhaps cotton.

The businesses also opted for natural or eco-products (such as EcoStore products) where suitable. For instance, when the knitting businesses (Participants 4-7) washed their garments an eco-detergent was used. Other businesses used Fair Trade products for cleaning or administrative stationery. It is generally easier to put plastic buttons onto a garment but Participant 5 found another company able to fabricate buttons out of a certain nut. So they did that instead of having plastic. The same applies for zips. They would rather select metal instead of plastic. Overall the ‘Making Conscious Decisions’ is roughly illustrated below (Illustration 8).

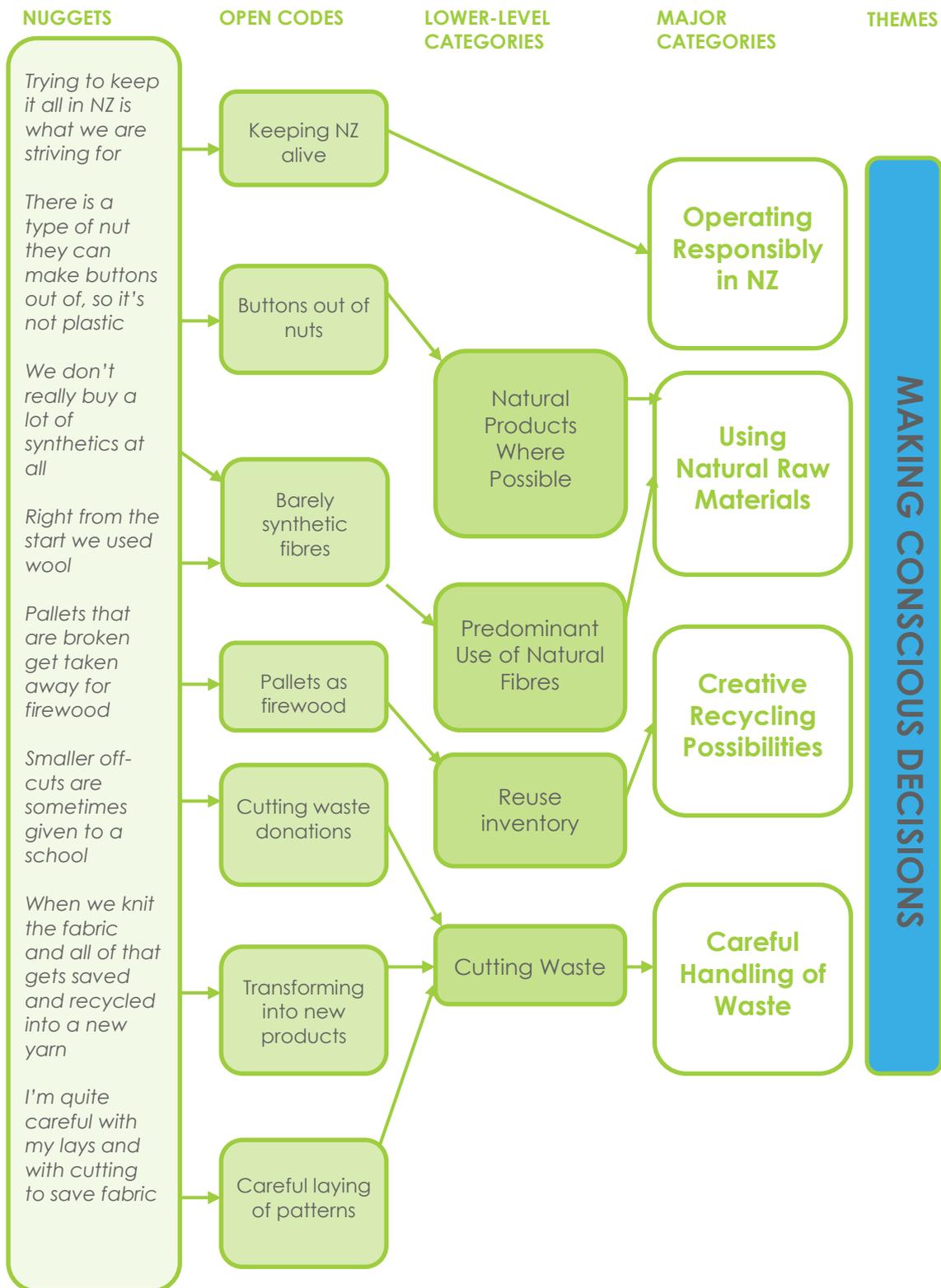


Illustration 8: Coding process illustration of "Conscious Decisions"

The larger organisations (Participants 7, 8 and 9) had more tools at their disposal due to their size. Practices like recycling and such were implicit for these businesses. They put greater emphasis on the implementation of policies, i.e. purchasing policies or compliance policies.

It was explained earlier, that these companies did have a global supply chain which resulted in a loss of imminent control and transparency since important steps of the manufacturing process, such as raw material extraction (Participant 8) or material processing (Participant 9) were outsourced to predominantly Asian countries. Thus they were subject to assuring that their suppliers and contractors abided by their sustainable standards. Participant 8 is most affected by this since 67 suppliers across various countries require constant supervision. Since it is paramount to create shared values and long-lasting partnerships several supplier agreements like service level agreements or ‘Terms of Trade’ were introduced. Icebreaker requires of its suppliers “to comply with Oeko-Tex, the environmental standards for textiles”.

While Participant 8 and Participant 7 conducted regular in-house and independent audits, there could not be found any such fact about Participant 9. However, what they stipulated for their supplies applied for them, too. The company is Oeko-Tex 100 and ISO 14001 certified and also a member of the Conservation Alliance, “a group of outdoor industry companies that donate their collective annual membership dues to grassroots conservation organisations working to protect wildlands and waterways”. Participant 8 is also a member of this initiative. Aside from having obtained a certification from globally recognised institutions, Participant 7 decided to introduce several policies to improve the tracking its environmental footprint. These policies included water and energy, product pathways and purchasing policies

*“for products and services developed and implemented to make sure those sustainability aspirations and objectives are considered when buying products and services across the business”.*

The intriguing discovery here is that some of the issues like ‘compliance’ and ‘traceability’ and the relating sustainable practices like ‘implementing policies’, ‘supplier agreements’ and ‘industry standard certifications’ mutually influence each other.

We know from the literature review that the use of chemicals is a matter that is not well explored at this stage and that there are some serious concerns about the hazardousness of the chemicals used in the various manufacturing steps. Participant 7, 8 and 9 were aware of

these problems, therefore they launched lists identifying not only raw materials but also critical substances. Participant 8 introduced a “Continuum of Performance for the traceability and chemicals management” which includes a “Restricted Substances List [specifying] the limits for chemical substances and [defining] usage bans for chemical substances”. To drive this even further, more substances will be scrutinised in the future since impacts are unclear at the moment or information is only sparsely available. Participant 9 exerted the same method saying that their “contractors are required not use any of the chemicals on our restricted substance list”.

Of course, these three also aimed at reducing their impact, however not solely by minimising waste and recycling. The life cycle, especially when the garment reaches the end of its life is being considered as well as investing more resources in upcycling to assess how a closed system processing could be established.

Analysing the implemented sustainable practices clarified that there were significant differences between smaller and larger sized entities. While the latter companies could exert their resourcefulness to ensure compliance with their own sustainability standards, the smaller ones could only operate within the limits of their resources. In this regard they experienced a noticeable disadvantage, since the willingness to do more is clearly evident. Nonetheless, they were doing their best by making conscious choices wherever they could.

The ‘Making Conscious Decisions’ theme/category was not only influenced by the manufacturing location and all its associated issues but also by the business philosophy, the consumer and a number of contradictions.

## 5.7 Business Philosophy

All codes involving some sort of philosophy could be translated into four different approaches, all demarking a different key focus. The four focus areas identified were ‘Efficient Manufacturing’, ‘Environment First’, ‘Truly New Zealand Made’ and ‘Value Driven’. Value in this context referred to a set of cultural values of “doing the right the thing” and not value in the sense of cost saving.

These approaches emerged by a more detailed scrutinising of the codes. As a consequence, some codes that did not seem to fit in any of the categories before, for instance “I prefer selling to people who like the world”, could now be labelled under ‘Value Driven’. I found this particular code significant, since it stipulates something that is of value to that specific participant and fundamentally influences the way the business is operated.

Other codes in this sub-category emphasised the importance of being mindful and being driven by a sense of values and by about what is right. The ‘Environment First’ philosophy denotes that prioritising environmental protection was a crucial factor. Several open codes were created and then made up the higher-level code ‘Environment is a Priority’. The following table gives an example.

'Nugget' from interview transcript	Initial Open Code
We believe in protecting the environment	Environmental Protection
Our contract isn't just with our customers, but with the environment	Importance of the Environment
Making more profit means more dollars we can channel back into our planet.	Giving Back to the Environment

Table 5: 'Nuggets' and initial open codes from interview transcripts

## 5.8 How the participants Understand sustainability

The interviews and the analysis of the sustainability reports revealed that the attitudes towards the concept of sustainability varied. Sustainability was perceived as an integral part and non-negotiable for Participants 8&9, stating:

*“Our products are designed with sustainability issues in mind, such as using materials sourced with minimal environmental impacts, ensuring that they meet safety requirements and educating our customers about how to care for them so they last”.*

These companies did have an international reputation and were relatively big in size, so they seemed to give this area greater attention or they felt the need to have it expressed publicly on websites or published in sustainability reports because “customers increasingly care (...) and they want to know about the ethical commitment of the companies they buy from” (Participant 9). Other codes showed a more idealistic and spiritual connotation of sustainability such as “keeping in existence” or “to support the spirits, vitality or resolution” (Participant 7).

This implies that sustainability should be about assuring that the planet’s resources do not deplete at a rate that cannot maintain the needs of future generations.

Participants 4 and Participant 5 rather described sustainability as a value that is inherently embedded in New Zealand's culture, claiming to be simply driven by what is right and that there is "a value system here that supports that" (Participant 4). The argument was that merely good business practice is sufficient to be more sustainable, stating that as a New Zealand company you start from a "high place" (Participant 4). This relates back to the statement earlier in this chapter stressing the green and sustainable image of the country.

Prior to the interview with Participant 5 their online presence was briefly analysed. A statement was discovered saying that "sustainable and environmentally friendly methods" were used. This was raised during the conversation asking about whether these methods were something specific or if there was a kind of sustainability plan. The response was as follows:

*"We just use common sense really. I mean we are all very hands-on here, so we don't have a lot of time for planning things like that, but we just use common sense like recycling all our cardboard and just being careful and not wasting things. We don't really have a written plan".*

Participant 4 also stated that there is no sustainability plan, arguing that they "try to do all these inherent things", for example not to "unnecessarily package our product" and "recycle boxes".

## 5.9 The Influence of the Consumer

Equally important to the understanding of sustainability was the influence of the consumer - A topic that naturally was discussed during all interviews since it is a matter of growing concern. The consumer does have considerable purchasing power therefore the question for manufacturers and designers alike were whether or not to heed the consumer's wishes. From what was gathered from the interviews and to some extent from Participant 8's sustainability report, the findings could be categorised into three themes: 'The Addiction to Fast Fashion', 'Care What You Wear' and 'Fostering Engagement'.

'The Addiction to Fast Fashion' was regarded as a severe problem in the fashion industry. Participant 6 described it "as a growing problem for small to medium-sized entities". This aligns with what we know about the industry in New Zealand: that it is extremely hard for the small businesses to compete with the cheap and fast fashion products. The cheap prices the customers pay for their fashion also leads to a tendency to not care for their pieces: "It's the problem with the cheap. People pay nothing for their clothes and they

throw it away” (Participant 3). As soon as the garment is no longer wanted the pieces are simply thrown away and a new one bought instead. There was a consensus that the world of fashion and peers dictate what is trendy and most people follow without thinking. The fast fashion factor goes hand in hand with the fact that we are considered to be a throw-away society. Participant explicated it as follows:

*“Fast fashion (...) it’s just like keyboard buds, when it’s not performing, you just buy another keyboard. It costs more to fix than buying a brand new thing. It’s just like technology these days, it’s all about replacement value, fixing just costs more... It sort of lasts for a period of time and then you throw it away”.*

Being a throw-away society implied that people clearly do not care, especially not about the environment. It was also noted that in New Zealand people are perceived as being reluctant to change compared to their European counterparts: “they all want to change, and not just the 10% like here”. It was also claimed that sustainability is only very rarely inquired about by customers. However, some positive traits about the customers were observed as well. It was mentioned by Participant 7 that “consumers are increasingly considering the sustainability of their purchases” and “where the things they buy come from” (Participant 9).

The coding and analysing showed that there is no real agreement on the aspect whether the customers care or not. All participants recited experiences on both ends however there is a greater tendency to say that people generally still do not care much. It is pretty much like this: “Some of our customers are very dedicated, some couldn’t care less” (Participant 6).

This dilemma led to an essential question: What do you do as a business or a designer? Do you follow the customer or do you try to make the customer follow you? Reactions to this were mixed with statements ranging from “they [the consumers] are the guide for us, we can’t make them do things” (Participant 6) and “we all do what the consumers want and as long they don’t demand other things, things might not change anyway” (Participant 5) or blaming the peer-pressure. Others mentioned something along the lines of that they tried to talk about sustainability with their customers and are aiming at “engaging our customers (...) in the sustainability journey (Participant 8). Participant 1 pointed out that people tend to be like sheep so they follow whatever the peer pressure dictates.

## 5.10 Observed contradictions

There was the following statement by Participant 9:

*“A sustainable source (...) is a good starting point, but it’s not enough. It would still be possible to make unethically-produced or poor-performing fabrics [from that source]”.*

During the interview with Participant 1 the following statement was made:

*“I can have a factory here that’s billowing smoke and pollute the water in the rivers and so that would still mean that I have a possum sock in the end, which is a good thing”.*

Yes, every possum that is made into a garment can be considered “a good thing” for New Zealand’s ecological systems, but it also poses the question whether this can be regarded as behaving sustainably.

This is why businesses like Participants 7, 8 and 9 emphasised that the whole process of manufacturing a garment needs to incorporate sustainable behaviour. It matters how the raw material is extracted, how the factory is operated, what and how much energy is used and that workers earn a fair salary.

A second contradiction concerned the manufacturing of lasting garments. It may result in a lower turnover, “it’s probably not good for your business (Participant 3).

Moreover, all participating businesses were constantly confronted with the “tension that exists between producing goods for profit, growth and expansion at the expense of the environment, thus increasing the potential for environmental degradation and poverty” (Participant 7).

For Participant 6, who make fashion for women only (at the time the interview was conducted), the feel of their fibres was very important. Sometimes wool is not the softest, so then they combine it with viscose or other even synthetic fibres to get the desired effect. Therefore sustainable options that were available are compromised by the texture and possibly ultimately what the lady consumer demands.

Also, and that is a valid point, being sustainable may be a luxury for some businesses, especially in times of trouble or in times of growth:

*“Some of these things [sustainable practices] are luxuries, if you are a company that’s going bust, then all your struggling or your growing quickly, sometimes you haven’t got... you take the cheapest option, because that’s all you’ve got. Or take the quickest option cause you’re growing” (Participant 4)*

Additionally it was noted that “desperate people do desperate things”.

Then, as mentioned earlier, the resource constraints blight the willingness to do more right from the start.

Then there was the dilemma to make something fashionable out of fabrics such as the possum-merino or the wool, since these fibres tend to go out of shape and do not look pleasing to the eye of the consumer. For the knitting businesses, it was apparently a problem that their products did not sell too well when they were trying to be more fashionable.

A compromise concerning energy was also noted. Participant 4 admitted openly that they “buy power and gas of Nova, and that’s a value (money) decision rather than a sustainable decision”. This exemplified that sustainable options were beaten by value (\$) options.

### 5.11 Aims and aspirations

Ultimately all participating businesses had aims they aspired towards which varied in scale depending on the size of the business. Goals were formulated very precisely by Participant 7, 8 and 9 as to what exactly they try to achieve in the near future.

*“We recognise that we have only one planet and we need to protect it to ensure resources for future generations by increasing environmental monitoring to determine the extent of the business footprint, by minimising the waste, energy and water footprint of our business and by making the most positive impact on biodiversity” - Participant 7*

Terms such as the circular economy or Cradle to Cradle were not mentioned. Instead, the common theme was that the systems in place should be improved wherever possible. Minimisation of several things was mentioned and that was what they share with the other participants.

## 6 DISCUSSION

The overarching research question framing this project was as follows:

*“Sustainability practices in New Zealand’s fashion industry: To what extent does the Cradle to Cradle® concept play a role?”*

The discussion will give a substantial outline of what needed to be taken into consideration to provide an answer to this question by first expounding on how sustainability manifests itself, eventually leading to a conceptualised model. Taking it from there strengths and weaknesses of the fashion industry will be highlighted in order to determine why New Zealand is not ready for the shift towards implementing the Cradle to Cradle framework. The section will conclude by what needs to occur to establish cyclical principles.

### 6.1 Industry profile - ideals and reality

To determine whether the Cradle to Cradle framework in the wider context of the circular economy is a matter of importance it was crucial to understand New Zealand’s fashion industry, especially the environment the businesses operate in, the local business dynamics and owner attitudes towards sustainability.

It was demonstrated that being a manufacturer, designer or retailer of fashion garments in New Zealand’s requires perseverance and resilience, if it is not desired to partially or fully relocate steps of the manufacturing processes overseas.

Generally, there is a common denominator within the businesses operating in the fashion industry that sustainability matters. However, the extent of implementing sustainability practices into the business processes varied considerably. The analysis showed that this may depend on how sustainability as a concept is perceived within the participating companies. Four participants have realised that sustainability needs to transcend the whole organisation. Initially the idea predominated that incorporating sustainable practices can only be implemented and put into practices by large-sized entities. Designer participant 2, by contrast, demonstrated that it is possible:

*“For us sustainability is everywhere, it's how you price-arrange, how you sell, down to the fibre that you choose and your whole administration.”*

Every aspect is clearly explicated on the respective website (Conscious Cloth Ltd, n.d.). This is in line with what Lewis et al (2007) reported in their study examining the uptake of sustainable practices: “Sustainability is a concept that is more inclusive than single business actions, and that there is a need to think holistically about the activities in which businesses engage and their effect within the global context” (Collins et al., 2007, p. 730).

When the statements of three participants were taken into consideration those who largely stated they rely on “common sense” and “doing the right thing”, this suggests that these statements may be utilised as a convenient excuse not to heavily invest to become a more sustainable organisation. Since these participants put considerable trust into the inherent values that helped driving good business practices they did not see the need of a sustainability plan. Inherent values refer to the personal values and beliefs of the management who in the New Zealand context tend to have “strong leadership and basic values of management as strong motivators for firms taking a proactive approach to sustainability” (Collins et al., 2007, p. 738). The study by Lewis and Cassel (2010) confirms this observation. They found that almost 70% of SMEs employing 6-49 employees do not have an environmental policy statement.

Having accumulated theoretical memos the question was then raised, how these businesses would actually know with certainty that they do operate in an environmentally responsible manner if they do not have any tools to assess and potentially revise some processes. Since they are also “very hands-on” it can be doubted that there is time aplenty to examine operating proceedings. The previous study noted that 73.9% of micro (0-5 employees) and 80.6% of small (6-49) entities did not gather data on environmental issues to report on (Lewis & Cassells, 2010).

The way New Zealand’s fashion industry was distilled after being exposed to the substantial labour and manufacturing cost advantages overseas transformed the sector irrevocably. As was shown in the findings, only few companies still manufacture in New Zealand:

*“The clothing trade is dying, there is hardly anything here now, businesses have closed down and it’, when the government had allowed the importing tax-free from China, that’s when things totally changed” (Participant 1).*

As a consequence, retailers and designers made use of the favourable conditions, especially cheap labour and largely shifted their operations abroad. The consequence was that

manufacturing solely in New Zealand became unfeasible for the majority of designers. These cost benefits and its influences are labelled as ‘The China Factor’, a phenomenon which is illustrated in the below theoretical flow-chart (Illustration 9). ‘The China Factor’ created several issues for businesses such as difficulties in tracing material extraction and making sure that contractors and suppliers complied with a business’s manufacturing standards. Three participants in particular constantly must ensure that all processes were conducted accordingly by regular visits and audits. Locally operating participants were not exposed to these issues but were constantly confronted with their own resource poverty concerning time and money. These issues influence how successfully sustainable practices can be upheld. Aside from that, all participating businesses aimed at making conscious decisions where possible, for instance trying to reduce packaging and be mindful and creative with regards to the handling of waste. The larger sized entities aimed at using only FSC certified packaging and implementing environmental policies.

‘Making Conscious Decisions’ are further affected by three more aspects. Contradictions, business philosophy and the consumer influence.

Concerning contradictions it was noted that for one participant the feel of the material is very important and so it may occur that a synthetic material like nylon is chosen to create a sheen and special feel than a sustainable fibre. Although natural fibres were mentioned as preferred option, this technically conscious decision is thereby contradicted.

The business philosophy of the respective participants contributes positively to the ‘Conscious Decisions’ theme because the philosophy itself is subject to aims and aspirations. These widely had the care for the environment in mind.

The consumer influence is also impacting the degree of how and why sustainable practices should be maintained. There is still no clarity whether the consumer should follow or vice versa. The key issue tends to be the following:

*“A lot of it is peer-pressure, it's like you've got to look like this. The season, or that season...and people are sheep and so they just follow when they buy it and the look changes and then they chuck it away.” - Participant 3*

Still, this study reported evidence for both possibilities, i.e. Participant 4 noted that “people ask about dyes” and Participant 6 explained “that some of customers are very dedicated”. Whereas one other study noted that only a third of the companies detected a consumer demand for greener products (Lewis & Cassells, 2010).

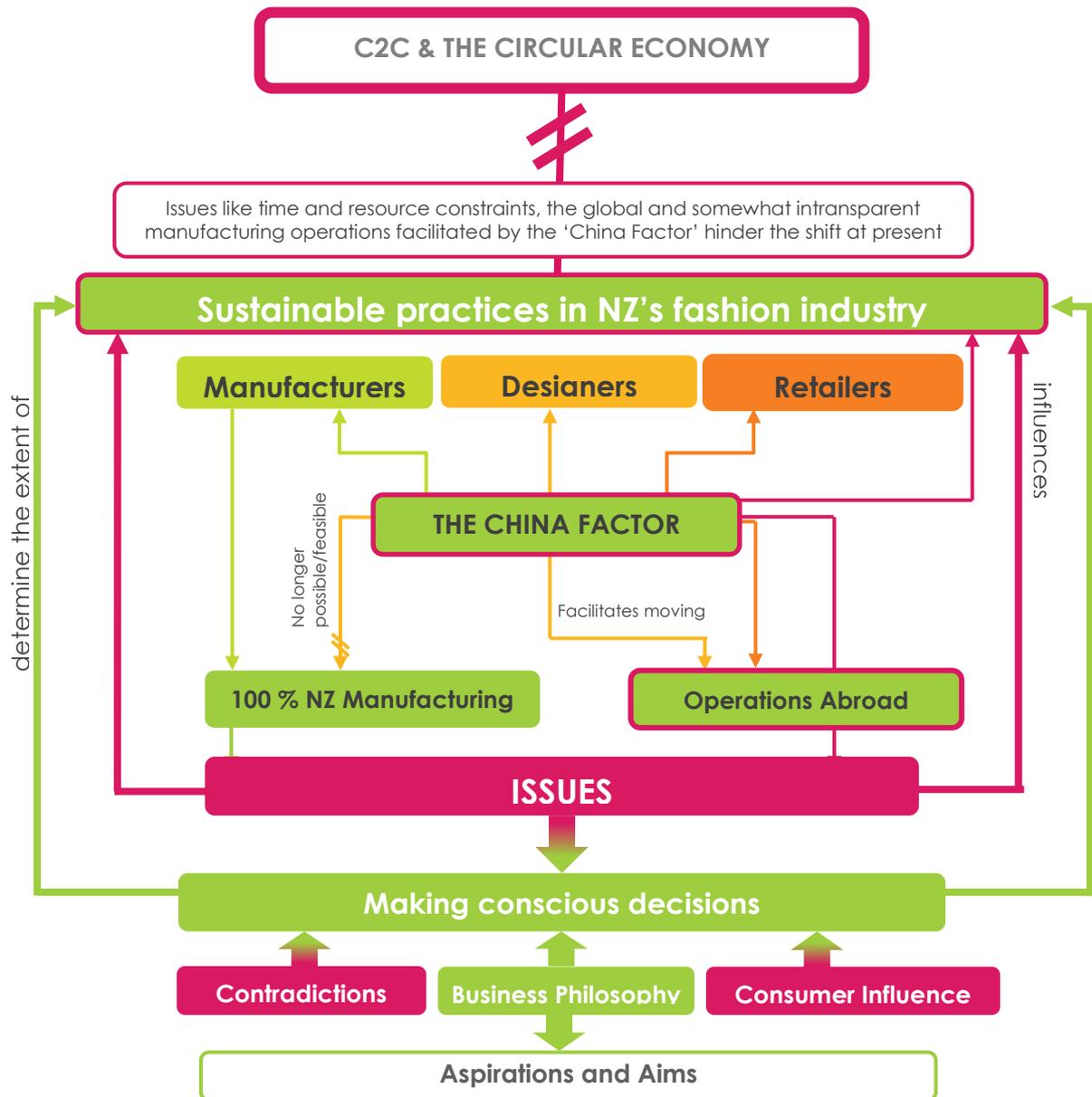


Illustration 9: Theoretical diagram of the fashion industry and the role of C2C

## 6.2 Strengths of the fashion industry

The willingness of the participating businesses, especially those working with the possum-merino fibre, to diversify in order to not succumb to the identified “China Factor” accounted for a certain sense of perseverance.

*“We were making fashion for Glassons and there were quite a few other stores that don't exist now but, with Hallensteins, mostly we made some cotton*

*and wool acrylic, but what happened is they started importing more and more from China, the pricing then got to low and we just couldn't compete, so that was when we had to diversify and find something different, some other niche we could fit into” - Participant 5*

Even two of the participating designers show such resilience by having their fashion pieces made by local experts although they are subject to importing most fabrics from overseas, frequently emphasising “I’ve chosen not to go there” (Participant 3).

Moreover, the inclination to identify new opportunities especially when it comes to handling waste and partially starting to treat wastage as a resource on its own proves that there are positive traits about the fashion industry in New Zealand. More of these efforts would be desirable to make a greater impact on a lively sector.

### 6.3 Weaknesses of the fashion industry

From what was found concerning overseas importing and manufacturing a major weakness was identified in the loss of transparency. Depending on the size of the participating entity this occurring loss can be countered to varying extents. Especially the designers who do not have another choice but to import fabrics from abroad and who also tend not to have employees are exposed to this. Since they are mostly unaware of where the raw material is sourced this then may result in a lacking awareness as to how exactly the fashion industry is harmful to the environment. However they do know that the “cheapness is bad for the environment” (Participant 1).

For instance, they may not know how many pesticides and insecticides are utilised in the process of growing cotton (Casey, 2008). Adding to that, a sole designer may view him or herself as small, their quantities are usually small and therefore they may feel insignificant (Collins et al., 2007). This in turn leads to not stipulating certain things like asking material suppliers how the purchased fabric was manufactured and what dyes are used, i.e. GOTS approved (Participant 2&8). And why should they, when even one participant had to admit that it is not possible for them to retrace the manufacturing process of a garment that was made from polyester.

This is why the goal of the Cradle to Cradle initiative “Fashion Positive” aims at establishing a material library as a first goal towards the transformation of the fashion industry: “Fashion Positive will create a resource library that will index inventive fabrics, dyes, trims, thread and more (...) making it easier for fashion brands and designers to source

trusted, certified materials (Cradle to Cradle Products Innovation Institute, 2014b). The businesses specialised in possum-merino do not have these problems, and even if it only requires minimal effort to inquire about processing, especially dyeing of the yarn since their supplier is based in Wellington.

If sustainability truly is considered important this normally becomes apparent when consulting a business's online presence. At present, this does not seem to occur with regards to SMEs who participated in this study. Again, the main reason may be the resource constraints. Four participants are undertaking serious efforts, but the only problem is that their earnest endeavours are not sufficiently promoted and communicated.

#### 6.4 Hindrances Preventing the Shift

Thus far this study indicates that sustainability within New Zealand's fashion industry is more an ideal rather than an irrefutable fact, although some tendencies towards a circular model were identified. At present these are outweighed by too many impediments. It was therefore deduced that sustainability and implementing sustainable practices is a matter of prioritising and of interest, especially so for the small to medium-sized entities.

The most pressing concern that hinders the transformation is the resource constraint SMEs face. Respondents stated that there is insufficient time to pursue or implement a rather radical shift, not even the time to brainstorm. This in turn results in the situation that most participating businesses can only operate sustainably and responsibly within the limits of their resources.

Moreover, the concept of 'reducing' and 'minimisation' - whether that referred to waste, the carbon footprint, packaging or energy - was mentioned almost repetitively frequent. The studies by Collins et al (2007) and Lewis et al (2010) found that this practice of minimising the companies' is rather driven by potential cost savings and financial benefits than a deep concern for the environment. The results of this study seems to reinforce this, but also demonstrated that some participants constantly seek out new opportunities to not merely minimise waste but use it as a resource instead.

Companies like the chair manufacturer Steelcase and the sports fashion brand Puma have proven that Cradle to Cradle products are not only bestsellers (Steelcase Inc, 2014) but also cheaper to manufacture (Puma, 2012). Therefore, sustainable practices can result in higher profitability which should suffice as an incentive and motivation to raise environmentally friendly manufacturing standards. If the participating businesses did not see

this opportunity, this may be due to a lack of motivation which in turn is encouraged by their resource poverty.

This study also revealed that the businesses with either 0-5 or 6-49 employees did uptake sustainable practices, however the aforementioned resource poverty prevents them from publishing statements or reports online. Thereby a suggestion by Collins et al (2007) is confirmed: “New Zealand businesses may be doing, but not reporting on sustainable practices” (Collins et al., 2007, p. 738).

The impression pertained that for these companies it is the first priority to be profitable and to ensure that all employees make a living followed by being mindful of the environment. It can be argued that this leads some of the entities to believe that operating a business here somewhat automatically means “that you start from a very high place” (Participant 4) due to New Zealand’s green image in the eye of the global public. This may foster a certain complacent behaviour. This behaviour is exemplified by only one participant, but being convinced that textile dyeing and/or energy happens in clean and ‘non-nasty’ ways due to the sole fact that is made in New Zealand may be regarded as alarmingly naïve.

## 6.5 Essentials to drive the shift

The literature disclosed New Zealand as being in its infancy concerning the shift to the circular economy (Jenkin & Zari, 2009; Stephen et al., 2011; Sustainable Business Network, 2014). It was clarified that the participating businesses mainly operated the old way and were more inclined to work towards minimisation which is firmly rebuked by the authors of the Cradle to Cradle framework (McDonough & Braungart, 2013). The focus therefore remains on minimisation rather than optimisation (MBDC, 2015b). It was acknowledged that this way of doing business is acceptable in the short-term until appropriate structures and resources are in place to facilitate the transformation from the linear (‘less bad’/ ‘minimisation’) to the circular model (Braungart & McDonough, 2009; Braungart et al., 2007; Jenkin & Zari, 2009).

### 6.5.1 Investing Time for Assessing Processes

Several changes could occur in the near future that may simplify the adoption of circular practices. Every business could invest time to consider the whole process of the garment. The five key categories of the Cradle to Cradle framework ‘Material Health’, ‘Material Reutilisation’, ‘Renewable Energy’, ‘Water Stewardship’ and ‘Social Fairness’

(Appendix A) can be considered as helpful tools to evaluate current operational processes and eventually show where improvements may be necessary (Braungart & McDonough, 2009; McDonough & Braungart, 2002, 2013). These can especially help assess three very important components.

The first step would be to ensure the full identification of used materials. A possum-merino garment consists of 40% possum and 60% merino, and the evaluation of what chemical ingredients are used in textile processing. Accumulating this knowledge may result in an optimisation towards even safer materials. The responses by two participants showed that this identification is already underway although it remains a constant challenge and ongoing supervision.

Secondly, natural fibres can be easily reused and safely biodegraded. Two-thirds of the participants mentioned those fabrics such as the possum and merino wool as well as sustainably extracted viscose are mainly used and always the preferred option. Where possible, the percentage of such materials should be maximised. If it is a synthetic fibre it may be a good idea to designate these as 'technical nutrients' in order to safely return these to the industry.

And finally, the renewable energy and therefore the issue of managing carbon emissions are also essential. New Zealand is a leader in supplying and generating significant amounts of energy from clean sources. The latest publication by the MBIE revealed that approximately a third of New Zealand's overall energy supply is generated from renewable sources such as hydroelectricity and geothermal steam. As of 2013, 75 % of all produced electricity derived from the exact same sources (MBIE et al., 2014). A value for money decision in these circumstances is still somewhat comprehensible as was expounded on by Participant 4. Making in possum-merino fibre accounts for an ecologically sound, green and uniquely New Zealand created product. It therefore may prove worth the effort to embrace the next step and transform these products into a truly sustainable product. The second benefit of opting for renewable energy is that, for instance electricity generated from geothermal sources creates considerably less emissions of CO<sub>2</sub> than from natural gas or coal (MBIE & Modelling and Sector Trends, 2013). Despite this, energy and what kinds of energy the participating companies buy were not intensively discussed. That may suggest that this area is not a matter of concern since this was also not covered in the study by Lewis et al (2010).

### 6.5.2 Take-back Schemes

Other simple measures would be to introduce a garment collecting scheme as was implemented by H&M and Puma in recent years (H&M, 2014a; PUMA, 2014). The Sustainable Business Network could also facilitate this, especially for the SMEs to encourage more collaboration and create synergies. Thus, the lack of time and resources could potentially be counterbalanced.

### 6.5.3 Creating Awareness

It was clarified that there is no agreement as how to react and cope with customer demands. This study noted that there are consumers seem to either be “very dedicated” or do not care at all (Participant 6). The SBN and the vision 2050 publications (Davis et al., 2010; Tomkins et al., 2012) point out that time is short to implement measures and policies that create sustainable living for nine billion people by 2050. This is why companies can no longer wait for the customer to demand greener and more sustainable products. The SBN therefore decided to promote and accelerate the shift towards the circular economy providing opportunities and incentives. The businesses could also attempt to influence the consumer by outlining the sustainability and value of their products.

At this stage, most SMEs do not report on their sustainable practices and only have limited capacities to promote their efforts. However, to make consumers aware and ultimately desire their products a striking and comprehensive online and offline presence is indispensable.

### 6.5.4 Debating Sustainable Fabrics

Essential for more cyclical models within the fashion industry is a sustainable fabric and extraction processes that do not pose threats and harm the environment. We have heard substantial information about fabrics, which ones are preferably used or what causes businesses to choose a natural, man-made or synthetic fibres. From a sustainability perspective synthetic fibres should be avoided since they do not biodegrade and may release components or remnants of chemicals and heavy metals into the soil and groundwater (Athalye, 2012). But then, if hazardous chemicals are used to dye wool or possum fibres, the same problem occurs.

This poses the question what actually constitutes a sustainable fabric. Deirdre Hoguet director of sustainability and material exploration at Designtex, a subsidiary of the C2C

certified company Steelcase, outlined that the sustainability of a fabric can be determined by four aspects: raw material extraction, textile production, added chemistry and end-of-life (Hoguet, 2014). If these steps are attributed to the possum-merino fibre can be considered as a sustainable fibre apart from minor uncertainties regarding the dyeing process. The possum fibre is biodegradable by nature but assuming there are toxic chemicals used then it may not be a desirable outcome to have these ingredients decompose into the soil. These issues were raised by the Swedish Chemical Agency outlining that the chemicals used for dyeing are not well researched and can potentially pose danger to human and environmental health (KEMI, 2014). This uncertainty also emphasises the fact that it can be intricate to determine whether a biological nutrient such as the possum fibre is intrinsically good or bad (McDonough & Braungart, 2002; Potting & Kroeze, 2010). Aside from this it may be concluded that it ultimately depends on the energy source. Issues regarding the bamboo fibre were expounded on in Chapter 5 which requires multiple amounts of energy input to be transformed into a fibre and that this cannot be perceived as a sustainable material. However, what if 100% renewable energy were used in the process?

### 6.5.5 The Importance of Networks

The previously cited study by Collins et al (2007) stressed that the importance of networks may be crucial to further foster sustainable development within SMEs: “Networking practices are a vital determinant of SME success, as the resource constraints characteristic of small businesses can be overcome through strategic network positioning” (2007, p. 730). In New Zealand’s case the role of the Sustainable Business Network may be of substantial value to help the small organisations to realise the shift, especially since the circular economy was promoted late in 2014 (Sustainable Business Network, 2014). A closed-loop industry could potentially take the following shape (Allwood et al., 2006):



Illustration 10: Exemplary closed-loop model of a future fashion industry

Instead of reaching the definitive end of its life a garment would be returned into the industry. Taking-back schemes can be organised by business networks or retail chains so that they can make use of the materials or the garments could be processed by a material bank that could provide access to a variety of fabrics to all industry participants.

#### 6.5.6 Final Remarks

This study identified a gap that there is currently very little happening in New Zealand concerning the circular economy and the Cradle to Cradle framework. The collected and analysed data have confirmed this existing gap. The cyclical model has not yet gained prominence amongst the participating companies. This is why the work of the Sustainable Business Network is all the more important to help accelerate the shift (Sustainable Business Network, 2014).

On the one hand the companies themselves lack the resources and on the other hand there is no time to wait for the customer to demand “more sustainability”, so there is clearly a need for more incentives. All New Zealand operating businesses mentioned that business is hard for most of the times, yet a sense of perseverance was and a determination to use “common sense” and being “driven by what is right”.

Aims of this research were fulfilled to the extent that a significant knowledge contribution of sustainability practices taking place within New Zealand’s fashion industry was made. Apart from that a clear answer to the research question to what extent the Cradle to Cradle framework/circular economy plays a role could be provided. At this stage: Unfortunately none.

This however does not imply that nothing else is happening in the fashion industry, it is simply manifesting itself in different levels. From the findings it can be suggested that the fashion businesses are still predominantly operating within the old linear model of ‘take-make-dispose’ primarily aiming at cost reduction. Time and resource constraints, the outsourcing of manufacturing operations that results in the loss of transparency and numerous associated issues prevents New Zealand businesses from accomplishing the shift to the circular economy at this stage.

## 7 LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

### 7.1 Limitations of the present study

Due to the qualitative research design of this study, the first limitation is the generalizability of the results and the built theory. By conducting in-depth semi-structured interviews, the method focused more on the participant's opinions and experiences. Most importantly, the survey is based on the perceptions of the respondents to the interview questions and as such it is a self-assessment. Such data are usually not as easily quantifiable. Moreover, the study only dealt with a narrow section of the entire industry and is therefore by no means applicable to the entire sector.

A second limitation certainly is the sample size that was used to build the theoretical understanding. With only nine primary and secondary sources to create the presented theory it can certainly not be considered representative.

Considerable time constraints are also a noteworthy limitation. Six months lie between the approval by the university's Ethics Committee which was granted on August 20, 2014 and the first submission date on February 21, 2015.

### 7.2 Implications for future research

Academic literature and research in the fashion industry, especially in New Zealand is still sparse though. It is an industry that provides millions of job opportunities worldwide and has yet to face severe challenges in the near future. Thus there are ample reasons to conduct further research in general.

More specifically, prospective studies could further look into New Zealand's fashion industry to generalise results and ideas presented in this study.

There are also potential synergies to be generated between the discipline of management and marketing since there is clear lack of communication and branding evident with regards to SMEs. For example, it could be examined if stronger communication efforts to showcase the substantial variety of sustainable fashion could contribute to more consumer awareness and ultimately influence consumer behaviour. This then could also accelerate the shift towards Cradle to Cradle and the circular economy.

## 8 CONCLUSION

By successfully building a theory that explored to what extent the Cradle to Cradle framework plays a role within New Zealand's fashion industry this study has made a considerable contribution to theory and practice within the outlined limitations. By constantly comparing and relating codes throughout the data gathering and analysing process, all instances could ultimately suit a theory:

*“It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.” - Sherlock Holmes*

Several issues were identified that significantly impede the adoption and implementation. Especially so the constraints concerning time and financial liquidity as well as issues regarding compliance and traceability mainly created by outsourcing manufacturing operations overseas.

Overall, it was found that this framework, along with the circular economy, has yet to gain momentum. It was clarified that Cradle to Cradle® and its adoption by industries and businesses is however considered essential to ensure sustainable and good lives for the global community. Some countries are further in this process than New Zealand but generally all nations are starting to realise that we are on the verge of a paradigm shift from an end-of-life to a closed-loop-thinking. Thus Cradle to Cradle can be seen as a valuable tool to achieve these ends – especially the interconnected aspects of ‘Material Health’, ‘Renewable Energy’, ‘Material Reutilisation’, ‘Water Stewardship’ and ‘Social Fairness’ can help re-assessing existing operating procedures.

Much has to happen, thus the New Zealand fashion industry provides great possibilities to realise the change and ultimately transform this sector into a showcase of the circular economy.

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Appendix

## Appendix A: The five C2C categories explained



### Knowing the chemical ingredients of every material in a product, and optimising towards safer materials

Identify materials as either biological or technical nutrients  
Understand how chemical hazards combine with likely exposures to determine potential threats to human health and the environment



### Designing products so all materials can return safely to nature or industry

Maximise the percentage of rapidly renewable materials or recycled contents used in a product  
Maximize the percentage of materials that can be safely reused, recycled, or composted at the product's end of use  
Designate your product as technical (can safely return to industry) and/or biological (can safely return to nature)



### Assembling and manufacturing products with 100% renewable energy

Source renewable electricity and offset carbon emissions for the product's final manufacturing stage



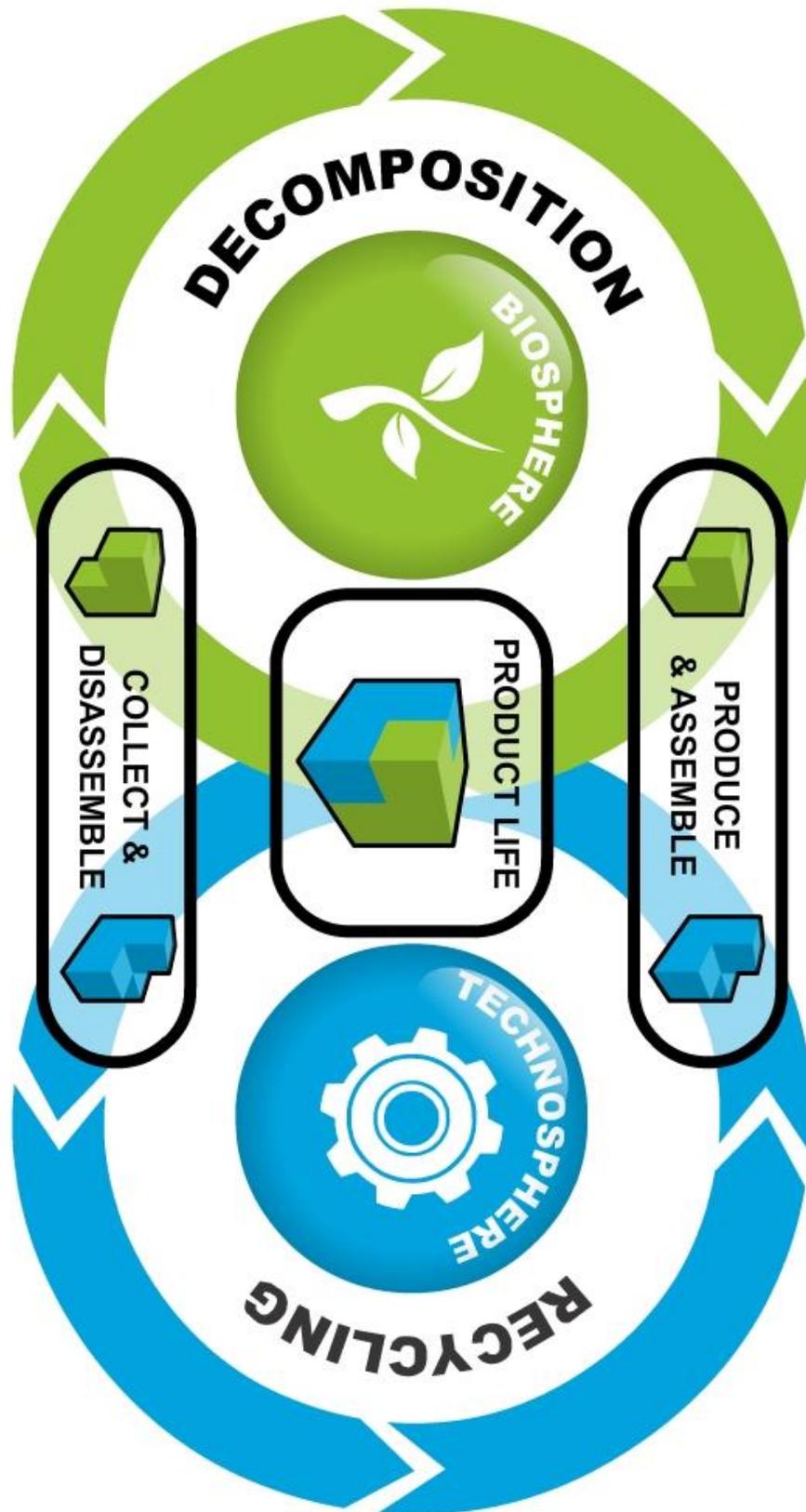
### Manage clean water as precious resource and essential human right.

Address local geographic and industry water impacts at each manufacturing facility  
Identify, assess, and optimize any industrial chemicals in a facility's effluent



### Design operations to honour all the people involved in the product manufacturing

Use globally recognized resources to conduct self-assessmnts to identify local and supply chain issues and third party audits to assure optimal conditions  
Make a positive difference in the lives of employees, and the local community



## Appendix C: Human Ethics Approval



## HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen  
Email: [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)

Ref: HEC 2014/85

20 August 2014

Josephine Dransfeld  
College of Business & Law  
UNIVERSITY OF CANTERBURY

Dear Josephine

The Human Ethics Committee advises that your research proposal "Moving beyond sustainability: redesigning the way we make our products. The case of New Zealand fashion industry" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 19 August 2014.

Best wishes for your project.

Yours sincerely

Lindsey MacDonald  
*Chair*  
*University of Canterbury Human Ethics Committee*

## Appendix D: Exemplary Email

https://exchange.canterbury.ac.nz/owa/?ae=Item&a=Open&t=IPM.Note&id=RgAAAAB8q84pkmKISLSdN6YAK8mRBwAdbEkpO7LvQYOJwJ7fAAz1AA/

Reply Reply All Forward           

## Master Thesis Research at University of Canterbury

Josie Dransfeld

To: 

Monday, 29 September 2014 3:38 p.m.

Dear Sir or Madam,

My name is Josephine, and I am a postgraduate student currently completing a Masters of Commerce degree in Management at the University of Canterbury.

I have a deep interest in understanding the impact of business on the sustainability of our environment. Therefore, for my Masters research I have chosen the New Zealand Fashion Industry – as an innovative and progressive industry in this country - to examine opinions and practices surrounding sustainability. I have been particularly interested in a framework that is gaining prominence in Europe - called Cradle-to-Cradle, and also wish to investigate the potential for such a framework in New Zealand. In short, this framework comprises a form of production and designing that has minimal impact on the world's natural resources.

I would be very appreciative if you or another suitable person from your company could spare me about 45 minutes to be interviewed with regard to your opinions and practices relating to sustainability.

Looking forward to hearing from you by return email, and thank you for your time.  
Yours sincerely

Josephine Dransfeld  
Masters of Commerce Candidate  
College of Business and Law  
University of Canterbury  
Email: Josephine.dransfeld@pg.canterbury.ac.nz

*Consent Form*

School of Business and Law  
 Telephone: +64 21 311 841  
 Email: josephine.dransfeld@pg.canterbury.ac.nz



**Moving beyond sustainability: Redesigning the way we make our products -  
 the case of New Zealand's fashion industry**

I have been given a full explanation of this project and have had the opportunity to ask questions.

I understand what is required of me if I agree to take part in the research.

I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.

I understand that the interview will be audio-recorded.

I understand that any information or opinions I provide will be kept confidential to the researcher Josephine Dransfeld and her Masters supervisor Dr Herb de Vries; and that any published or reported results will not identify me or my businesses. I understand that a thesis is a public document and will be available through the UC Library.

I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after 5 years.

I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.

I understand that I can contact the researcher Josephine Dransfeld or supervisor Dr Herb de Vries for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz))

By signing below, I agree to participate in this research project.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

This consent form must be signed before your interview commences.

## *Information Sheet*

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School of Business and Law  
 Telephone: +64 21 311841  
 Email: [josephine.dransfeld@pg.canterbury.ac.nz](mailto:josephine.dransfeld@pg.canterbury.ac.nz)  
 Jul 17, 2014



### **Moving Beyond Sustainability: Redesigning the way we make our products - The case of New Zealand's fashion industry Information Sheet for interview participants**

I am Josephine Dransfeld, a postgraduate student currently completing a Masters of Commerce degree at UC. My Master Thesis seeks to examine sustainability practices within New Zealand's fashion industry. I am particularly interested in a framework that is gaining prominence in Europe. This is called Cradle-to-Cradle and is a form of production and designing that has minimal impact on the world's natural resources.

Your involvement in this project will be to participate in one interview at a time and in a public place that is convenient to you. The interview will be recorded on a digital audio recorder and will take no more than one hour. As a follow-up to this investigation, you may be asked some further questions if needed. This would be done via telephone or email. You will also receive a copy of the interview transcript and you have the right to delete or change any part of your interview.

You may receive a copy of the project results by contacting the researcher at the conclusion of the project.

Participation is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw, I will do my best to remove any information relating to you, provided this remains practically achievable.

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without your prior consent. All transcripts will be given a code number and will not identify you or your organisation. Only the researcher and her supervisor will have access to the data. The data will be securely stored in password protected computer files and hardware devices. The data will be destroyed after 5 years. However, a thesis is a public document and will be made available through the UC Library.

The project is being carried out as a requirement for the Masters of Commerce degree by Josephine Dransfeld under the supervision of Dr Herb de Vries who can be contacted at [herb.devries@canterbury.ac.nz](mailto:herb.devries@canterbury.ac.nz). They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)).

If you agree to participate in the study, you are asked to complete the accompanying consent form.

Thank you for your interest

Yours sincerely,

Josephine Dransfeld