GREEN FINANCING: FINANCING CIRCULAR ECONOMY COMPANIES

Case Studies of Ragn-Sellsföretagen AB and Inrego AB

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Green Financing: Financing Circular Economy Companies
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Abstract:

The circular economy (CE) has been identified as a catalyst in sustainable development and economic growth that has the potential to move society from the traditional linear model of resource consumption in the form of take-make-waste to an innovative circular model in the form of reduce-reuse-recycle.

Transitioning from the linear economy to the CE requires changes in four areas: material and product design, business models, global reverse networks and enabling business environments. This study considers the financing needs of CE companies as a result of business model changes.

Through the case studies of Ragn-Sellsföretagen AB and Inrego AB, analysed with secondary data from ING Bank and primary data collected through semi-structured interviews with the case companies, this research sheds more light on the financing needs of circular economy companies and how they are financed. Findings from this research suggest that the financing needs of circular economy companies depend on the value proposition of the company. In accordance with the pecking order of capital structure, all financing needs of the companies studied are financed from internal sources, particularly retained earnings before external debt financing is accessed. Findings indicate the willingness of banks to finance circular economy companies.

The results of this research suggest that the circular economy companies studied do not need financial support from the government or its agencies to succeed even though favourable laws are welcomed. They report that their long-term success depends on their ability to remain innovative in their business models, aligning with Schumpeter’s creative destruction model.

Key-words: Circular economy, 3Rs, business model, circular business models, finance
Dedication:

To the whole family back home in Ghana, and here in Sweden

Acknowledgements:

Glory to God for this work done.

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Definition of Terms

**Biomimicry**: a concept that describes the use of nature-based solutions to solve challenges facing mankind.

**Business model**: the rationale of how an organization creates, delivers, and captures value.

**Circular economy**: an economy that is restorative in the sense that it utilizes resources for production, but with a zero net effect on the environment.

**Collaborative consumption**: the process whereby which the cost of use and distribution of resources is shared among a group of people; it may take the form of renting or exchanging.

**Cost to income ratio**: the share of the cost to the income of a firm.

**Linear economy**: an economy which utilizes natural resources for the production of goods and services, and generating waste as end result without any restorative actions.

**Market capitalization**: the total market value of a company’s outstanding shares usually listed on a stock exchange.

**Net profit**: profit after tax.

**Spaceship economy**: describes the earth as a closed economy whereby resources are finite in supply, hence resources must be utilized over and over again, to ensure sustainability.

**Sustainability**: a concept which describes the means by which the needs of current generation are met without compromising the needs/welfare of future generations.

**Triple bottom line**: a way of assessing business on the basis of three dimensions of performance: social, environmental and financial dimensions.

**Working capital**: the capital stock required by a firm to finance the day-to-day activities of the firm.

**Impact investors**: investors who invest to obtain environmental benefits in addition to financial gains.

List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BM</td>
<td>Business Model</td>
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<tr>
<td>BMI</td>
<td>Business Model Innovation</td>
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<td>C2C</td>
<td>Cradle to Cradle</td>
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<td>CC</td>
<td>Collaborative Consumption</td>
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<tr>
<td>CE</td>
<td>Circular Economy</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<td>CFO</td>
<td>Chief Finance Officer</td>
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<tr>
<td>CIO</td>
<td>Chief Information Officer</td>
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<tr>
<td>COO</td>
<td>Chief Operating Officer</td>
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<tr>
<td>CRO</td>
<td>Chief Risk Officer</td>
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<tr>
<td>GBP</td>
<td>Great Britain Pounds</td>
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<tr>
<td>SEK</td>
<td>Swedish Kronor</td>
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<tr>
<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
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<tr>
<td>UNCSGD</td>
<td>United Nations Conference on Sustainable Development</td>
</tr>
<tr>
<td>UNWCED</td>
<td>United Nations World Commission on Environment and Development</td>
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CHAPTER ONE
INTRODUCTION

1.1 Background

The environmental sustainability concept was recognized as being of interest to researchers beginning in the early 1960s (IISD, 2012), however in recent times there has been a lot of debate about the urgency of taking active steps to save the environment from degradation and preserving it for future generations. Currently, the focus appears to be on doing less harm to the environment by managing pollution and reducing waste, however is generating value from waste potentially a better idea (Bocken et al., 2013)? Some have argued that this can be achieved by the “circular economy” (CE) through innovative business models (Ellen MacArthur Foundation, 2013; 2015; Murray, Skene & Haynes, 2015). The CE acts as a catalyst in sustainable development and economic growth by moving society from the traditional linear model of resource consumption, which comes in the form of taking-making-wasting, to an innovative circular model in the form of reducing-reusing-recycling (ING Bank, 2015).

The linear consumption model, which has been used since the era of the industrial revolution, has resulted in the use of one and a half times of the planet’s worth of resources for production and consumption to meet demand for the almost 7.5 billion people on earth now (Butler, Dixon & Capon, 2015). The linear economy utilizes natural resources for the production of goods and services, generating waste in the process, which further degrades the environment, depleting natural resources mainly through the extraction sectors and reducing the worth of the natural resources by polluting them (Murray, Skene & Haynes, 2015). The linear model has been referred to as “Cowboy Economy” by Boulding (1966) because of the open-one-way nature of resource consumption in production.

The circular economy (CE) “refers to an industrial economy that is restorative by intention” (Ellen MacArthur Foundation, 2013, p. 26). When an economy is considered circular, it presupposes that the net effect of its economic activities on the environment is zero, because in extracting resources and manufacturing goods and services for consumption, the very little waste that is generated goes back to the manufacturing process, and the product during its lifetime can be reused over and over again (Murray, Skene & Haynes, 2015). Preston (2012) postulates that the CE originated from the theories of industrial ecology during the 1970s, making a case for redesigning industrial systems, bearing in mind that it is important for resources to be utilized efficiently in their natural setting. This industrial ecology model is still in use today. The CE is not synonymous with recycling, rather recycling is a component of the circular economy (Murray, Skene & Haynes, 2015; Stahel, 2010).

Some researchers have noted that the CE is not only regarded as a way of protecting the environment. In addition, they point to its economic aspects in terms of cost savings, job creation, as well as disruptive and innovative business models that change or challenge the way business is done (Wijkman & Skånberg, 2015).

Figures 1 and 2 below depict resource flow in the linear economy and the CE. The linear economy ends with waste at the end of a production flow, but the CE uses waste from the production flow as materials for production creating a circular flow of resources.
Studies by Bocken et al. (2013) have revealed that sustainable business models that put the “triple bottom line” approach and stakeholders at the core would be needed. The triple bottom line is a way of assessing businesses on “three dimensions of performance: social, environmental and financial” (Hall, 2011, p. 4). American economist and Nobel laureate, Milton Friedman (2007), asserted that the only group of persons with a moral right to make demands on a corporation is its owners or shareholders; however, American philosopher, R. Edward Freeman (2010), widely known for his works on the stakeholder theory, argued that there are other groups apart from owners who can make a moral claim on the corporation because actions of the corporation affect them directly or indirectly. These other groups are called “stakeholders.” Businesses create “shared value” through the use of strategies that enhance the wellbeing of the stakeholders as well as economic gains for the shareholders (Porter & Kramer, 2011).

A business model describes “the rationale of how an organization creates, delivers, and captures value” (Osterwalder & Pigneur, 2013, p. 14). These three processes consists of a range of activities starting from sourcing raw materials for the production process to receiving payment from the customer for the value received from the firm (Chesbrough, 2007). New business models would redefine what constitutes value and the rationale behind its creation, while re-thinking the reason for the existence of the firm (Bocken et al., 2013), impacting directly the financing of the business.
Sustainability, as a means of meeting today’s societal needs without robbing future generations of the ability to meet theirs (Brundtland Report, WCED 1987), is high on the EU’s agenda today. Policymakers measure progress towards sustainable development targets in ten strategic areas, including sustainable transport, sustainable consumption and production as well as natural resources targeting a ‘resource-efficient’ Europe. The performance of member states is presented in its biennial reports (European Commission, 2015; 2010). Sweden is widely recognized by many analysts as being keen on sustainable development and, in its quest to achieve its sustainable development goals, recognizes the need to work in tandem with global and regional organizations, while ensuring that these goals are integrated into existing national policies (Swedish Ministry of Environment, 2003). In Towards a Circular Economy, a report by the Ellen MacArthur Foundation in collaboration with the McKinsey Company, the authors show that implementation of the CE can result in material cost savings of $706 billion per annum in consumer products. Figure 3 below shows the breakdown of the consumer products and the material cost savings made, totaling 21.9 percent of the current materials used up in production.

Figure 3: Adoption of a CE model can yield net materials cost savings

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Savings</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaged food</td>
<td>270</td>
<td>Extrapolated from case examples in 3 major categories</td>
</tr>
<tr>
<td>Apparel</td>
<td>155</td>
<td>Differentiated by geography, subcategory</td>
</tr>
<tr>
<td>Beverages</td>
<td>121</td>
<td>Full range of consumer goods industries</td>
</tr>
<tr>
<td>Fresh food</td>
<td>98</td>
<td>Energy and materials at today’s prices</td>
</tr>
<tr>
<td>Beauty and personal care</td>
<td>26</td>
<td>All measures economically viable today</td>
</tr>
</tbody>
</table>

The distinctive nature of CE business models compared to traditional business models and its attendant effects on other sectors of the economy has resulted in firms looking for opportunities within the circular economy or partnering with firms that have moved towards the circular economy to profit financially (ING Bank, 2015). The European Investment Bank, in its quest to support the EU agenda for the circular economy, has since 2005 spent 15 billion euros in supporting projects it considers eligible for financial support because they deliver value to their consumers while reducing their resource consumption using innovative methods (European Investment Bank, 2015).

Financial institutions could be one of the key partners of a firm, helping in the creation, delivery and capture of value through its economic activities, and the kind of support they offer could be critical to the success of any firm that has moved towards the circular economy. The financial sector is one sector that, though not directly involved in the circular economy, can indirectly play key roles, thus hampering or
engendering the development of the CE through its regulations (Alfredsson & Wijkman, 2014). Across Europe, governments have policy frameworks for capital markets that are aimed at encouraging sustainable development, including the circular economy; however, studies show that there are disparities between these policies and the actual financial systems, which are not properly suited to the circular economy agenda (Clements-Hunt, 2011).

### 1.2 The Problem

Transitioning from the linear economy to the CE requires changes in four basic constituents, namely: “(1). Materials and product design, (2). Business models, (3). Global reverse networks and (4). Enabling conditions” (Planing, 2015, p. 2). This research focuses on the new business models arising from the transition to the CE.

Moreover the CE offers new avenues for firms to create value in terms of resource efficiency, job creation, and innovative technology, but in reality the growth of the CE raises some concerns for other stakeholders to which much attention may not have been given to until now (Preston, 2012; Wijkman & Skånberg, 2015). Studies by Wijkman & Skånberg (2015, p. 28) show that investments required by the Swedish government to support the movement towards the circular economy are “estimated to be in the range of 12 billion €, or 3% of GDP, per annum from now on until 2030.” These are economic transition costs, and the political ones are reiterated by Ellen MacArthur Foundation (2015), not to mention the costs at the firm level.

There is therefore a need for further studies into the effects of the CE on business models and stakeholders; hence this study focuses on the particular financing needs of firms that have moved towards the CE. Sweden is considered one of the countries blazing the trail in laws pertaining to CE; however issues of the strength of and incentives for its financial sector to shoulder the financial needs of the circular business models have not been discussed much, hence this study explores the activities of banks in Sweden in support of the circular economy (Alfredsson & Wijkman, 2014; The Guardian, 2014).

New business models associated with the circular economy require several different streams of financing (ING Bank, 2015); hence this study explores how banks in Sweden are working with firms moving toward the circular economy.

### 1.3 Purpose and Research Questions

This study aims to contribute new knowledge by investigating how banks in Sweden are working with businesses that are moving towards the CE in meeting their financial needs, given the innovative business models of CE firms. In order to achieve this purpose, the study explores the differences and similarities between circular and traditional business models. This may reveal whether any financing that CE firms are receiving is tailored to suit their peculiar needs, or if they are offered the same assistance offered to the firms doing business as usual.

Based on the foregoing, this study would complement earlier studies by investigating the following research question:

**What are the financing needs of CE firms and how are they being met?**

In the context of the above research question, this study explores the following sub-question:
How are banks in Sweden working with circular economy firms to meet their financing needs given the new business models of these firms?

1.4 Delimitations

Delimitations mark out the boundaries of the research in terms of the extent of work the researcher will do and what is deliberately left out. It affects the validity and extent to which generalizations can be drawn from the results of the study, and without it readers may have challenges recognizing the confines of the study (Ellis & Levy, 2009).

This research has been narrowed down to CE companies and a bank that operates in Stockholm, Sweden. The research also focuses on investigating financing as the contextual variable of these CE companies and the role banks play in meeting their financing needs. An investigation into the finance supplying institutions is narrowed down to banks, which are only one of many players in the financial sector.

Of the many CE businesses that exist in Sweden, only two are interviewed. This relates to the definition of CE established by the researcher, set to the 3Rs: Reuse, Reduce and Recycle. Also in selecting the banks for study, only commercial banks are chosen, not other types like savings, investment and co-operative banks.

The findings from the interviews are not intended to create theories related to the choice of finance deployed by a CE firm or the choice of projects financed by banks. Rather, the conclusions describe the financing methods chosen by the CE firms and the activity of banks in financing CE firms.

1.5 Research Structure

The following chapter contains a literature review on the evolution of the CE and some related concepts, as well as a brief review of the relationship between the CE and sustainability. A review of empirical literature on innovative business models, their role in business success and linkages with the CE is done in this chapter. A review of literature on financing for the CE and general sources of finance for business organizations are given.

The third chapter of this paper describes the analytical framework of this study relevant to analyse the research question. Therefore theories on business innovation, financial intermediation and capital structure are discussed. The business model canvas is also applied in the discussion of the research findings.

In chapter four, the research paradigm, the approach of this study and the reason for their choice is discussed. The chapter also reveals the type of data collected and the mode of collection, given the units of analysis of the study. Also the ethical issues that were considered during the course of the research are mentioned.

In chapter five, the empirical findings of the case studies and interviews of Ragn-Sellsföretagen AB and Inrego AB are presented together with secondary data on the CE financing activities of ING Bank.

The study is concluded in chapter six, where the findings and implications of the empirical results of the case study and limitations of the research are discussed as well as recommendations for future research provided.
CHAPTER TWO
LITERATURE REVIEW

The following sections explore empirical literature on the evolution of the circular economy, its current status and its implications for business models. CE companies, like other companies, require various streams of financing (ING Bank, 2015), more so as a result of innovative business models applied, hence in these sections a comprehensive review of existing literature on business models is provided in order to gain an understanding into its components.

2.1 Evolution of the Circular Economy

The concept of the circular economy is lauded as one that has the ability to help preserve the environment while at the same time providing economic benefits to society (Ellen MacArthur Foundation, 2015; 2013; Alfredsson & Wijkman, 2014; Clements-Hunt, 2011). The term was first coined in 1990 by environmental economists David W. Pearce and Kerry R. Turner in their book, Economics of Natural Resources and the Environment; however, the origin of the concept is from industrial ecology (Andersen, 2007; Preston, 2012).

Prior to the use of the term “circular economy,” economist Kenneth E. Boulding had already conceived the idea of a circular economy and perceived the threat to natural resource availability that would occur in the future given the trajectory of human activities. In his article “The Economics of the Coming Spaceship Earth,” he stated, “Earth has become a single spaceship, without unlimited reservoirs of anything … therefore, man must find his place in a cyclical ecological system” (Boulding, 1966, p. 7), implying a system in which resource consumption was a cycle, using resources over and over again.

In the years that followed, Swiss architect and economist Walter Stahel researched how activities that lengthen product life contribute to a more sustainable environment and wealth creation. He asserted that activities aimed at prolonging product lives, like reuse, repair, reconditioning and recycling, would create an economy that restocks its resource base in a circular motion, eventually alleviating poverty and creating employment, resulting in a more sustainable world economy (Stahel, 1982).

In the late 1990s, William McDonough and Michael Braungart turned sustainability discussions back to the idea of an economy in which resource consumption is in spiral loops, consequently publishing their book, Cradle to cradle: Remaking the way we make things, in 2010. They opined that, in the design of products, consideration should be given to resource efficiency such that products do not go from the ‘cradle to the grave’; rather all waste should be ‘designed out’: the biological components could be returned to the natural environment and the technical parts reused (McDonough & Braungart, 2010).

**Figure 4** depicts how production materials separated into two main categories, i.e. biological and technical, flow in loops in a circular economy. Biological materials of products at the end of their useful life become “biological nutrients” in the biosphere. The technical materials on the other hand are able to maintain their capabilities, hence are re-used directly by subsequent owners, undergo some repair, and are then distributed for consumer use again or recycled.
The CE consists of these concepts and some others like biomimicry, collaborative consumption and inspiration from industrial ecology. This could be one reason why there is no single definition of the circular economy. Meanwhile, the Ellen MacArthur Foundation (2015) reiterates a point from Walter Stahel: that the CE should be viewed as a structure, a blanket concept that takes inspiration from many different disciplines but stands on the same set of underlying rules.

It is important to note that there are critiques of the CE and its various concepts. Researchers have raised concerns about the ability of the CE to achieve 100 percent circularity through an industrial economy that imitates the natural world, where waste in one system is food in another system (Benyus, 1997). Mentink (2014) is of the view that achieving completely closed material loops is impossible at the moment or too expensive to implement, since that implies that no technical materials are lost in the manufacturing process and systems have to be put in place to collect every little bit of scrap around the world, or else all materials have to be biodegradable so that they decompose into the biosphere.

Moreover, other researchers suggest that the CE may lead to negative path-dependencies, as materials that ought not be used or changed are kept in the cycle through reusing and recycling. Subsequently,
materials that are not sustainable may enter the cycle, and remain for a long time because they enable efficient running of the material loops (Robèrt, 2000).

M. Berntsson (2015) asserts that the CE could result in lock-in effects arising when a long lease contract is signed between a lessor and lessee, however a new technology may come, but the lessee may be bound to old technology due to the contract.

2.1.1 Cradle-to-Cradle

German chemist Michael Braungart, together with American architect William McDonough, further developed the term “cradle-to-cradle” (C2C) and registered it, even though it was originally coined by Walter Stahel towards the end of the 1970s (Ellen MacArthur Foundation, 2015b).

The concept of C2C focuses on the design of products, making the constituents of products reusable after they have been scrapped by owners. McDonough & Braungart, (2010) assert that every product should be designed in a way that makes it relatively easier for its biological components to be returned to the natural environment, and for the technical components to re-enter the production process as raw materials. This way, the idea of waste as the end of any production process is eliminated completely.

DSM is a Dutch company that manufactures plastic molding equipment, which has been used as plastic components in automobiles and other engineering products. It has used C2C systems since 2008 and works closely with the McDonough Braungart Design Chemistry (MBDC), which grants C2C certification to companies. DSM received certification from MBDC for several of its products, which has resulted in among other things an increase in turnover of €8.1bn in 2010 (The Guardian, 2011).

The C2C concept has been critiqued by Reay, McCool & Withell (2011), who opined that determining what is natural and good to be released into the biosphere or otherwise can be a very complicated procedure. They questioned how the natural waste would be managed and treated, as energy inputs are not focused on in the C2C. (The C2C assumes unlimited energy inputs, which is idealistic.)

Bijsterveld (2008) addresses the misleading nature of the C2C concept due to its narrow view on returning and recycling products by manufacturers or their agents. According to Bijsterveld, this could have severe implications for transportation systems as well as increased energy consumption and pollution from the recycling processes.

2.1.2 Biomimicry

Biomimicry refers to the use of phenomena that occur in nature in manufacturing processes. According to the Biomimicry Institute (2015), biomimicry can be used to address the sustainability challenge in industry, when patterns that occur in nature are imitated. Janine Benyus is a biologist, innovation consultant and co-founder of the Biomimicry Institute. In (Benyus, 1997), her book *Biomimicry: Innovation inspired by nature* that popularized the concept of biomimicry and the need to learn from nature, she mentions the need for human activities to follow models that occur in the natural environment.

According to Mercier-Laurent (2015), we can find the solution to many of today’s environmental challenges by observing and imitating our environment, like imitating the ‘technology’ used by termites when they build their anthills which gives them the right temperature within all year round.
The Ellen MacArthur Foundation (2015) has put forth three foundational tenets for biomimicry:

- **Nature as model** – in order to solve human challenges, it is imperative to research the models that occur in nature and imitate these setups and methods.
- **Nature as measure** – in assessing how sustainable inventions are, the measure of their eco-friendliness should be used.
- **Nature as mentor** – in measuring how valuable nature is to human existence, priority should be given to how much can be learned from nature, as opposed to only its extractive potential.

Marshall & Lozeva (2009) criticized biomimicry, stating that the current practice of biomimicry leans towards innovation and not sustainability. They cited the use of biomimicry concepts by militaries, which can damage the environment.

### 2.1.3 Collaborative Consumption

“Collaborative “consumption” (CC), also known as the “sharing economy,” has been defined as “people coordinating the acquisition and distribution of a resource for a fee or other compensation” (Belk, 2014, p. 1597). People may receive compensation in other forms, like exchanging one item for the other or any other non-monetary compensation agreed upon (Belk, 2014). The CC process is usually “coordinated through community-based online services” (Hamari, Sjöklint & Ukkonen, 2015, p. 1). This has been made possible due to advancement in information communication technology and social media (Gansky, 2010; Botsman & Rogers 2011; Hamari, Sjöklint & Ukkonen, 2015).

According to the definition by Belk (2014), gifts and any form of sharing for which compensation is not given are not CC. The most popular form of CC is car sharing (Gansky, 2010).

Bardhi & Eckhardt (2015) assert that CC is not about sharing, rather it is about access. They described sharing as a virtue that exist in social circles among people who are familiar with each other, but with CC, there is a ‘third’ person, an intermediary company that brings strangers together. At this point it ceases to be sharing; rather one pays the owner for access to resources for a specified length of time.

CC allows consumers who hitherto cannot afford ethical consumption to have access to such products (Bray, Johns, & Kilburn, 2011; Gansky, 2010). CC also promotes reduced resource consumption and makes collection of products after their useful life by manufacturers for recycling and refurbishment easy (Stahel, 1982; McDonough & Braungart, 2010).

### 2.2 The Relationship: Circular Economy and Sustainable Development

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report, WCED 1987, p. 43). Achieving sustainability is the objective of sustainable development (UNESCO). Considered as the model for development across the globe in the long term, the goals of sustainable development are achieving environmental and social developments in a symmetrical way, while protecting the environment. In academic literatures, three pillars or spheres of sustainability have emerged: economic development, social development and environmental protection (U.N. General Assembly).

The conclusion based on empirical evidence (Ellen MacArthur Foundation, 2013; 2015; Murray, Skene & Haynes, 2015; Wijkman & Skånberg, 2015) is that the CE fits well into the three spheres of sustainable development, as it is a system that replenishes resources needed for manufacturing, while promising opportunities for economic development which will in turn improve the quality of life. The
main features that make the CE stand out in the achievement of sustainability goals are (1) the closed material loops and (2) the designing of products with the possibility of reusing them in mind (Murray, Skene & Haynes, 2015).

In 1987, the Brundtland Report was published by the UNWCED, aimed at creating a sustainability route. In 1992, the “Earth Summit” (also known as Rio+92 meeting) was held in Rio de Janeiro, Brazil to turn the sustainability goals mentioned in the Brundtland Report into tactical plans and action points (UNCSD, 2012). The Rio+92 meeting, organized by the UNCED secretariat, saw 172 governments and 2,400 representatives of non-governmental organisations (NGOs) present. One major strategy that emanated from the Rio+92 meeting was “eco-efficiency.” Eco-efficiency simply incorporates ethical, environmental and economic considerations into the linear production model, *doing less bad* (McDonough & Braungart, 2010). A business is said to be eco-efficient when it reduces the pollution and waste it generates, uses cleaner sources of energy, renewable sources instead of non-renewable sources, thereby reducing the negative impact of its operations on the environment. These are efficient ways of controlling resource consumption, but the CE offers more effective ways of resource use (Wijkman & Rockström, 2012).

### 2.3 Business Model Implications of Circular Economy

According to Stahel (2014), the CE is not just about ensuring environmental sustainability; it has a “business case” as well. As mentioned in the introduction, new business models are necessary for a successful transition to the CE. In this section, we review literature on circular business models, based on the literature on the business model (BM), business model innovation (BMI) and CE.

#### 2.3.1 Circular Business Model Innovation

Osterwalder & Pigneur (2013, p.14) defines business models as “the rationale of how an organisation creates, delivers and captures value.” Business model has also been defined by Amit & Zott (2012) as a system of interrelated activities carried out by an enterprise in the process of doing business with customers, partners and suppliers. Through their business models, enterprises sell their new products or services to consumers (Chesbrough, 2010).

Business models can be sources of innovation (Amit & Zott, 2001; Osterwalder 2004) and a means by which industrial systems can deliver sustainable developments environmentally and to society (Bocken et al., 2013). Business model innovation (BMI), according to Frankenberger et al. (2013), is the new means of creating and capturing value by changing some of the building blocks of the business model, beyond just introducing new products or services, but possibly leading to the realization of new opportunities. According to Bocken et al. (2013), a sustainable BM is any BM that creates positive societal and environmental impact as well as decreasing the negative effects of the business’ activities in creating, delivering and capturing value. They further assert that sustainable business models have the ability to manage innovations in technology to ensure sustainability on a systems level. Wells and Seitz (2005) state that circular business models are sustainable business models, because of the closed-loop flow of resources in the CE.

Circular business models have been defined by Mentink (2014, p. 35) “as the rationale of how an organization creates, delivers and captures value with and within closed material loops.” Knowledge on the development of such models is relevant for the successful implementation of the CE (Lewandowski, 2016). The basic elements needed to develop circular business models, in addition to the nine building blocks of business models, are the basic tenets of the CE (Lewandowski, 2016). The
six principles of the CE, according to the Ellen MacArthur Foundation (2015c), are represented by the acronym ReSOLVE:

- **Re – Regenerate**: stands for the proposed move from non-renewable energy and material sources to renewable sources. ‘Biological nutrients’ should be capable of being returned to the biosphere and ‘technical nutrients’ should be reusable.
- **S – Share**: encourages the use of a product, not ownership of it, as well as subsequent use in the form of ‘second-hand’ items. Utility from the product is maximized and product life is increased as long as the item is safe for use.
- **O – Optimize**: the aim is to realize resource sufficiency and efficiency by designing out waste and eliminating waste from the manufacturing process by turning waste into feedstock for another product.
- **L – Loop**: manufacturing is done in loops, with more attention being given to the smaller inner loops because they ensure optimal material use due to the speed in which materials can be returned into the production flow for reuse or back onto the market for other consumers.
- **V – Virtualize**: customer experience should be delivered in ‘soft copy’ (electronic form) if possible to reduce material consumption.
- **E – Exchange**: old materials could be replaced with equally old and advanced non-renewable materials.

The successful adoption of circular business models depends on a large extent on consumer behaviour, among other factors (Planing, 2015). Behavioural change is critical: whether consumers are willing to pay relatively high prices for a more durable product, or willing to share a product with other users rather than owning it, goes a long way toward determining the success of CE BMs (Renswoude, Wolde & Joustra, 2015). In developing countries, ownership rights to products are very important to consumers, hence ‘sharing’ products does not work very well (Planing, 2015).

Policymakers may also need to make policy adjustments to propel the CE BM to success (Stahel, 2014; Renswoude, Wolde & Joustra, 2015; Planing, 2015; Ellen MacArthur Foundation, 2015c). Stahel (2014) proposed changes in fiscal policies by removing taxes from ‘renewable’ material sources, including human capital. He explained that this would accelerate the development of not only the CE but all other activities that preserve human culture and sustain societies.

As shown in figure 5 below, Renswoude, Wolde & Joustra (2015) created these CE BM types based on the four cycles put forward by the Ellen MacArthur Foundation as ways of creating circular value, then added one of their own principles. The four cycles are short cycles, long cycles, cascades and pure circles. The cycles had to do with maintenance of products to make them useful for as long as possible through repairs and maintenance, cascades for new mixtures of recycled materials and components, completely reusing materials and components without recycling them. Renswoude, Wolde & Joustra (2015) added their own principle, which is to move physical products to virtual ones, as much as possible.
2.4 The 3Rs

For the purposes of this study, the CE is conceived as comprising the 3Rs: reduce, reuse, and recycle (Jawahir & Bradley, 2016; Murray, Skene & Haynes, 2015; Lieder & Rashid, 2015; Preston, 2012).

### 2.4.1 Reduce

During the years of the second industrialization era of the 1920s, ‘reduce’ meant to use fewer resources to manufacture the same amount of output; however in the 1980s, among eco-efficiency circles, ‘reduce,’ the main principle, also implied minimizing pollution, emissions and waste.
(McDonough & Braungart, 2010). The obligation to reduce emissions and resource consumption had been considered the responsibility of manufacturers (Stahel, 1982); however consumers can contribute to resource efficiency by altering their consumption habits (Preston, 2012).

“I drink water but I do not have a reservoir in my basement” (*The Guardian*, 2015). This is a comment made by Frank van der Vloed, the general manager of Philips Lighting Benelux, and it shows that ownership is not the only way to obtain utility from a product. New business models have emerged which discourage ownership of products, changing the relationship between manufacturers and consumers, from buyer–seller to ‘lessor’–‘lessee’. Consumers are able to enjoy the services the product offers without actually owning it (Preston, 2012; Gansky, 2010).

This model is also called performance economy or ‘servitization,’ in which consumers do not pay for the product; rather they pay for the use of the product, whilst the manufacturer retains ownership rights over the product (Morgan & Mitchell, 2015; Stahel, 2010).

Through collaborative consumption sometimes referred to as sharing economy, consumers are able to reduce resource consumption by postponing the use of new products and subsequently the harm done to the environment (Preston, 2012; Belk, 2014; Gansky, 2010; Morgan & Mitchell, 2015).

Stahel (1982) asserts that lengthening product-life is another means of reducing the amount of natural resources consumed and waste created. He defined product-life as the duration when a product is used by the consumer and it determines the rate at which products are replaced, the resources consumed in manufacturing and the waste created at the end of the product’s life. A Product can be repaired or refurbished after it has lived out its first life, then reused by subsequent owners.

### 2.4.2 Reuse

In the CE, biological materials decompose to become nutrients in the biosphere, and technical materials, which would have been discarded as waste, are captured back in the loop and reused (Huber, 2000).

According to the Ellen MacArthur Foundation (2013), a product is reused when it is being used subsequent times for the same purpose intended by the manufacturer or a slightly different one, in its initial form or after some work has been done on it to improve it. Reuse would be profitable as a BM if the product has a life-span that is long enough to allow it to be improved for use by subsequent owners.

Products may be prepared for reuse by repairing, reconditioning, remanufacturing and remodelling, whilst essentially maintaining the manufacturer’s original purpose for manufacturing (Stahel 1982; McDonough & Braungart 2010; Ellen MacArthur Foundation, 2013).

The performance economy model makes it relatively easier for manufacturers to take back products from consumers for reuse, or to remanufacture some components of the original product for reuse (Stahel, 1982). Otherwise, the manufacturers and their agents may have to buy back unwanted or non-functioning used products from owners, (McDonough & Braungart, 2010).

In the past products have been reused when items had been donated to charity organisations for gifts to underprivileged people in society, and today people shop at second-hand shops to contribute to a more sustainable world (Morgan & Mitchell, 2015). Organisations like Erikshjalpen sell second-hand items, and the proceeds are used to support charity projects in Sweden and other parts of the world (Erikshjalpen).
Renault, the French car making company, from its plant in Choisy-le-Roi, near Paris, renovers car engines and other automobile parts for resale as well as remodelling other parts and components to make it relatively easier for them to be taken apart and reused or recycled when they have come to the end of their useful life. This plant is the most profitable in terms of operating margins in the company, due to cost savings it makes on energy consumption and water usage (Groupe Renault; Nguyen, Stuchtey and Zils, 2014).

2.4.3 Recycle
The process of transforming materials and items that have been discarded as waste into new items is referred to as recycling (Jawahir & Bradley, 2016). Recycling may be closed looped (manufacturing new products from waste, without changing the original composition of the material used) or open looped (manufacturing new products which are lesser in quality because the materials lose their original composition) (Morgan & Mitchell, 2015).

Open loop recycling is relatively common. It comes with concerns, as products are not manufactured to facilitate easy reuse and recycling, and it costs so much capital and energy consumption to recycle items due to their material composition (McDonough & Braungart, 2010; Ellen MacArthur Foundation, 2013). Recycling is economically profitable when the items being recycled are valuable and there are mechanisms in place for their easy collection and reprocessing (Narayan, 2001). Notwithstanding, the U.K. tripled revenues from recycling to about 19 billion GBP between the years 2000 to 2010 (Morgan & Mitchell, 2015).

Renault redesigns some components to make them easy to recycle. It has formed a joint-venture with a waste management company to benefit from the latter’s competence in recycling steel waste (Nguyen, Stuchtey and Zils, 2014). The Renault group became the first car manufacturer in Europe to invest in end-of-life car recycling when it went into a joint venture with Suez Environnement, a joint owner of Indra, one of Renault’s subsidiaries that dismantled seventy five thousand cars in 2013 that have been discarded as scrap by owners. This allows Renault to purchase some components that have been recycled at cheaper prices, and as such can sell to customers at relatively cheaper prices (Groupe Renault).

2.5 Green Financing
Now that the study has investigated the elements of the CE and business models, attention is now turned to financing the CE transition. A successful transition to the CE requires both specific policies as well as investments in that area (Wijkman & Skånberg, 2015). Up until now, the roles played by the banking and other financial institutions in the push for sustainability have never been considered important (Alfredsson & Wijkman, 2014) as compared to issues of supply chain management in sustainable manufacturing.

Recent studies on the activities of banks show that they actually contribute negatively to sustainable development, and can be held responsible for aiding pollution and environmental degradation, flowing from their profit-making objective (Alfredsson & Wijkman, 2014). According to the same report (Alfredsson & Wijkman, 2014), banks have slowly drifted away from their primary role, which King & Levine (1993) say is to evaluate and provide external financing for entrepreneurial innovations based on Schumpeter’s model of financial intermediation (Schumpeter, 1934).

2.5.1 The Need for Financial Assistance
Small and medium-sized enterprises (SMEs), particularly relatively new small ones, have challenges accessing finance, because financial institutions often associate very high risk values to them. Even when
SMEs are able to get the bank to agree to finance them, obtaining the collateral or the guarantees demanded by the bank is another hurdle (Rizos et al., 2015).

CE companies may need help financing the relatively higher initial cost of a BMI (Rizos et al., 2015) or an alternative energy source based on renewable sources. If the company is an SME that has not saved up enough to finance the project, it may require external help and the decision to finance or not depends on the perceived profitability. Businesses with a CBM may need financial assistance with cash flow issues, especially when they operate a performance economy model. This situation arises because customers, who previously made upfront payment for purchase of products, now make relatively smaller monthly payments for use of the product (Acsinte & Verbeek 2015).

2.5.1.1 Fixed Capital and Working Capital Requirements
Peirson et al. (2014) mention the classification of financial needs based on the duration of repayment of the funds: fixed capital requirements versus working capital requirements. They explained it this way:

*Fixed capital requirements* are the relatively higher amounts of money needed to start a business, a new business line or renovation or improvements to factory plants. They are also required for the purchase of permanent assets like land, machinery and equipment as well as financing research and development. These sources of finance are repaid over long periods of time (more than a year). The amounts invested are contingent on factors such as the kind of investments, and the size and the nature of the business organisation.

*Working capital requirements* are obtained from temporary sources and necessary for the daily operations of the business. Working capital is needed to purchase inventory of finished goods or raw materials, components, parts and consumables. It includes expenses like salaries, rent, taxes and all other accrued expenses. The working capital requirements depend on the cash available to the business from its operations, hence a trading business’ need for working capital would be lower than what is needed for a manufacturing business.

2.5.1.2 Equity Capital and Debt Capital
Zimmerer, Scarborough & Wilson (2002) mention two classifications of capital based on the sources of capital and the level of risk that comes with them. Capital may be supplied by owners of the business or by others.

*Equity capital* refers to the funds invested in the business by the owners. It is very high risk, because the owners undertake the primary risk of the business, and owners lose this investment if the business fails. This kind of capital is not to be pulled out of the business unless the business is being liquidated, however more of these funds may be added to the business.

*Debt capital* refers to monies that companies receive as loans, making interest and/or principal payments to defray the debt completely. Unlike equity holders, debt holders are not owners but may become owners in the company if their debt instruments are converted to equity. Debt holders have lower risk compared to equity holders. Their interest payments are mandatory, and can push a company to file for bankruptcy and liquidation if the business is not able to make payments on the interest payments. Debt holders are the first people to receive payment upon the liquidation of the business.

2.5.1.3 Internal and External Sources of Funds
Businesses may raise the funds they need from external and/or internal sources (Brealey, Myers & Marcus 2001; Zimmerer, Scarborough & Wilson, 2002; Mikócziová, 2010).
Internal sources include all the funds that are raised by the business from within the organisation from additional investments made by the owners, retained company earnings, debt collection, and sale of inventory or fixed assets.

External sources include term loans and notes from financial institutions, bank overdrafts, leasing, sale and lease back, invoice discounting, factoring, or the issue of new shares.

2.5.2 Choice of Sources of Business Finance
Zimmerer, Scarborough & Wilson (2002) indicate that knowing and selecting the appropriate type of financing for a business is critical for the success of a business. They also mention the importance of planning for the financing needs of the business, particularly fixed capital. According to Mikócziová (2010), from the firm’s standpoint, the various sources of finance are not perfect substitutes, rather the choice of what type of finance to exploit follows a certain order. To be specific, internal sources are preferable to external sources. This is due to the fact that between business managers and potential investors, one party has information the other is not privy to, and this is called “information asymmetry.” This issue of information asymmetry is very pronounced in the case of new businesses, with innovative business models or growing businesses (Mikócziová, 2010).

2.5.2.1 Internal Finance
Retained Earnings refers to company profits that are saved up by a company for investment purposes rather than distributing it among equity shareholders as dividends. According to Lintner (1956), most companies plough back about 50 percent of their earnings for investments purposes, and if it is not enough, management may resort to other sources of finance.

Additional investment by owners. In the case of many sole proprietorship businesses, the owner may inject more capital when needed, if retained earnings are not sufficient. As is prevalent among family businesses, Hutchinson (1995) asserts that, owners may invest their own additional capital in a bid to prevent the dilution of their ownership control.

Voluntary Sale of Assets. Companies may fund its investments by voluntarily selling off some of its fixed assets (Hovakimian & Titman, 2006). Voluntary sale of assets may be motivated by financial constraints and operational reasons. With regards to the operational reasons, a company may sell off assets in a bid to streamline its operations to improve efficiency (Hovakimian & Titman, 2006; Edmans & Mann, 2013).

2.5.2.2 External Finance
Floating shares. Businesses may do an initial public offering (IPO), issue additional shares to existing shareholders or new shareholders or convert debt instruments into shares in order to raise funds (Stein, 1992). Shares in the form of equity shares or preference shares give their holders ownership rights in the company. Rights issues are additional shares that are issued first to existing shareholders. According to Carpenter & Petersen (2002), earlier research has portrayed financing through shares more quite risky than the other forms of financing; however this has been proven false by empirical evidence as new firms are increasingly doing IPOs. In a study by Bolton & Freixas (2000), their capital market equilibrium showed that firms that are considered to be high risk in terms of investments are usually not financed by loans, but through additional equity.

Bank overdrafts and term loans. Term loans are monetary loans that are repaid in regular instalments over a specified period of time, usually one to ten years, at an interest rate which may change over the period. Term loans have been used by firms to finance their fixed capital and working capital requirements (Strahan, 1999). The term loans can be in the form of ‘credit line’ when the bank allows gives a firm a
maximum loan amount that the former can maintain over a period of time; unlike the term loan with a specific amount disbursed (Nini, 2008). Bank overdraft is a credit line that a bank offers its customers that allow them to make withdrawals from their accounts even when the account balance is zero. Bank overdrafts, due to their temporary nature, are used to finance working capital expenditure (Sara & Peter, 1998). Term loans like overdrafts are provided by banks and they are different from bonds, which are also offered by non-bank financial institutions.

**Bonds.** Brennan & Schwartz (1977) explains that bonds are fixed income securities, with a rate of return and may be redeemed at par, a premium or a discount depending on the terms the bonds were issued at. The securities and exchange commission of the U.S. likened bonds to IOUs. The issuer of the bond is the borrower and the investors purchase the bonds at an agreed interest rate, making interest payments over the duration of the bond and repaying the principal amount at the end of the duration (maturity) of the bond. Upon redemption of the bond at maturity, the same amount invested as principal (at par), a higher amount (at a premium) and a lower amount (at a discount) may be paid.

**Finance lease and operating lease.** Firms lease the use of an asset rather than purchase it for various reasons, and depending on the type of asset and the terms of the contract, the lease is accounted for as an operating lease or a finance lease. Lease payments are treated the same way as interest payments on debt obligations; however leases are kept off the balance sheet of the lessee if it is an operating lease but finance leases must be present on the balance sheet (Fülbier, Silva & Pferdehirt, 2006). In operating lease contracts, the lease has right to use the assets, but all ownership rights and risks still remain with the lessor (asset’s owner) and at the end of the lease period, the asset is returned to the lessor by the lessee. It is not so with the finance lease, the lessor transfer’s some ownership rights and risks on the asset to the lease, and at the end of the lease period there’s an option in the lease contract that allows for total transfer of ownership of the asset to the lease (Beattie, Goodacre & Thomson, 2000).

**Factoring and invoice discounting.** Factoring is the situation when an expert firm purchases the debtors ledger of another firm at a discount, advances funds to the seller of the debtors’ ledger and collects the debts from the debtors. It is a short term method of financing used often by small businesses to improve their cash flow situation and fund their working capital needs (Soufani, 2001). With invoice discounting, the debtors’ ledger is not sold to another company, rather debtors invoices are used to secure a loan at a fee and percentage interest for each invoice (Bogin & Borkowski, 2002).

**Venture Capital.** This refers to capital often given to businesses that are in the early stages of development by venture capitalists, in exchange for ownership rights in the company. Venture capital is used by companies that are unable to raise sufficient internally generated funds, and highly indebted companies are usually turned down by venture capitalists as likely candidates to receive funding (Baeyens & Manigart, 2005). In addition to providing capital, venture capitalists devote time and expertise in the running of the venture to ensure its success, as well as helping the company to secure additional funding (Gorman & Sahlman, 1989).

**Figure 6** shows the distribution of the choice of sources of finance for companies in the Organization for Economic Cooperation and Development (OECD) countries in 2005 and Slovakia in 2005 and 2009. It shows that most companies finance their investments internally with retained earnings, then through banks, other sources like leases, factoring and gifts and loans from family, then banks and equity. Mikócziová (2010) asserts that most companies resort to debt instead of equity in order not to lose control over their companies.
Figure 6: Choice of sources of finance

Source: Mikócziová, (2010, p. 70)

Figure 7 below provides at a glance a summary of the choice of sources of finance explained early on in this section, classified as the multiple forms of capital required to finance CE business models. It identifies the various players in the capital markets and the types of financial support they can offer. From the figure, it is observed that banks offer the highest variety of financial support to CE companies. The last column depicts which CE business model or activity is best suited for what source of finance. Banks prefer financing their credit-worthy clients and their projects. However because the majority of CE business models are in their pilot stages, such firms are not able to access bank loans, but rather receive support from foundation and impact investors (ING, 2015). The term “impact investment” was coined by the Rockefeller Foundation and it refers to investments that are made in businesses with the goal of reaping environmental benefits in addition to the required financial benefits (Rockefeller Foundation).

Figure 7: Financing circular business models

<table>
<thead>
<tr>
<th>Need to finance circular business models</th>
<th>Bank finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate debt</td>
<td>Traditional corporate lending to finance circular businesses with guarantees at corporate level.</td>
</tr>
<tr>
<td>Lease</td>
<td>Can fit per use earning models, Applicable to clients that are creditworthy and products with predictable residual values in second hand markets.</td>
</tr>
<tr>
<td>Factoring &amp; supply chain Finance</td>
<td>Can solve the prefinancing issue of pay per use earning models by selling uncertain future cash flows to a financial institution.</td>
</tr>
<tr>
<td>Structured finance</td>
<td>Can be a financing option for large stand alone circular projects.</td>
</tr>
<tr>
<td>Balance sheet reduction through off balance finance</td>
<td>Can solve the issue of balance sheet extension.</td>
</tr>
</tbody>
</table>

| Capital Markets | Equity finance: Initial Public Offering | Valuable sources of finance for mostly larger and mature circular businesses that meet the scale and requirements of the capital markets. |
|-----------------|----------------------------------------|
| Debt finance: Green Bonds                                                   | Most circular businesses are still at their pilot stage, are not profitable yet or are lacking a track record. Non-commercial finance can bridge the gap from pilot stage to growth stage as they are less concerned with being fully compensated for the financial risk. |
| Foundations and Impact investors                                            | Finance source for the many startup businesses in the circular economy. However, their requirement for high growth and relatively fast payback horizons might limit suitability for circular businesses. |
| Venture Capital, Private equity, Family Offices                            | Offer new payment facilities and possibly working capital solutions. |
| Near banks like Google, Apple, Amazon, etc.                                 | Finance source for circular businesses that involve the (local) community or those based upon ideas that appeal to the crowd. |

Source: ING Bank
2.5.3 Short-Term versus Long-Term Profitability

It is the relatively higher initial costs associated with sustainability activities that deter SMEs; large corporations are generally better able to afford it. These SMEs may find it relatively difficult to attract external funding from financial institutions, with a promise of long-term benefits to both institutions with lower (or no) short-term profits to show for it (Rizos et al., 2015).

However, current trends reflect a focus on short-term profitability, with requirements for quarterly reports and cash flow statements that ‘look good,’ even if it results in dire consequences in the long term (Alfredsson & Wijkman, 2014). Banks and other financial institutions have made relatively high investments in oil and gas explorations, as well as extraction of shale in the U.S. and Canada for the high returns it offers in the short term, as compared to ‘green’ investments, with little regard to the long-term environmental implications (Wijkman & Rockström 2012; Alfredsson & Wijkman, 2014).

The ‘short termism’ of financial institutions can be attributed to the need to back projects in the shortest time possible due to the perceived high risks and uncertainties associated with projects whose profitability is projected in the long run (Boquist, Racette & Schlarbaum, 1975). Studies by Bocken et al., (2013) have shown that circular business models are not very profitable in the initial stages, but have the potential to become very profitable in the future when legislation favours it and scale of operation increases. A clear example was when the hybrid car was introduced; it was not so profitable then, but now its profitability is increasing (Harrop, 2012).

2.5.4 Current Measures to Support the CE

Many academic articles have been written with a critique of the current financial ecosystem and on what role the financial sector needs to play to propel the CE to success. A lot has also been said about the need for policy shifts in the financial sector to make the CE succeed (Rizos et al., 2015; Clements-Hunt, 2011; Wijkman & Rockström 2012; Alfredsson & Wijkman, 2014; Wijkman & Skånberg, 2015; Ellen MacArthur Foundation, 2013; 2015; European Commission, 2014). This section of the study looks at what is being done now in the financial sector to contribute to the success of the CE.

According to a report by the European Commission (2014, p. 6), it is working on reducing the risk exposure associated with investments in the CE by developing some new financial instruments “such as the Natural Capital Financing Facility of the Commission and the European Investment Bank.”

Since the introduction of the CE as a national policy in 2008, the Chinese government has taken decisive steps in ensuring that the concept is ‘fed’ financially as well. The regulatory body of banks in China, the China Banking Regulatory Commission (CBRC), charges every financial institution to set up organizational guidelines and internal memoranda that promote the CE. Banks are required to lend towards projects in renewable energy sources like wind and solar and penalizing any customer of theirs who does not comply with environmental laws (Clements-Hunt, 2011). In keeping with this, “the ICBC, the largest bank in the world by market capitalisation, has created a Green Credit Policies Department in an effort to become the leading green bank in China” (Clements-Hunt, 2011, p. 607).
This chapter presents the analytical foundations that underlie this study. This chapter also presents a review of theoretical literature pertaining to studies by other researchers on business models, since the aim of the study is to make an assessment of the financing needs of CE companies, given their business models that differ from the traditional ones. Literature on theories of financial intermediation and choice of financing sources is also reviewed, since finance is the contextual variable of this research.

3.1 Schumpeter’s Creative Destruction

Renowned economist Joseph A. Schumpeter coined the term “creative destruction” to describe the process through which an endogenous change in a nation state’s economic structure occurs. This may be a result of continuously changing industrial dynamics through the creation of new technologies that renders old ones obsolete (Schumpeter, 1942). This term became famous through the publication of his book, ‘Capitalism, Socialism and Democracy,’ first published in 1942. According to Schumpeter (1934), creative destruction is the main reason for economic development under capitalism, and the entrepreneur as an agent of production causes creative destruction. Creative destruction is achieved by combining the production factors in novel ways to invent new processes or value propositions which may be imitated by competitors when they succeed.

Schumpeter (1934) credits the entrepreneur for innovative combination “of previously disconnected ‘production factors,’ and this could result in new markets and industries, products, production processes, and source of supply, all being potential business model components” (Hedman & Kalling, 2003, p. 52). Schumpeter (1939) as quoted in Planing (2015, p. 3) describes innovation as “the introduction of new goods, new methods of production, the opening of new markets, the conquest of new sources of supply and the carrying out of a new organization in any industry.” These variables can be considered as potential innovations in business model (Hart & Milstein, 1999; Planing, 2015).

According to Eisenhardt & Sull (2001), the innovative firm is put in that privileged position of causing change as a result of the factors in its business model, namely its product/service offering, key activities performed to offer the value, and key resources that instigate the value creation process. They posited that firms are prone to give more attention to improving their key processes, in order to stay competitive in markets that are highly uncertain and rapidly altering their dynamics.

3.2 Nine Building Blocks of Business Models

Through their business models, enterprises sell their new products or services to consumers (Chesbrough, 2010). According to Osterwalder & Pigneur (2013, p.14), a business model is “the rationale of how an organisation creates, delivers and captures value.” They identified nine building blocks of business models, which they presented on a Business Model Canvas, which serves as a strategic management tool for creating new business models or developing existing ones (Strategyzer.com). For the purposes of this study, these nine building blocks are considered as the components of business models, despite differing works by other researchers (Afuah & Tucci, 2003; Linder & Cantrell, 2000; Alt and Zimmermann, 2001).
The nine building blocks according to Osterwalder & Pigneur (2013) are: (1) Customer Segments (2) Value propositions (3) Channels (4) Customer Relationships (5) Revenue Streams (6) Cost structure (7) Key resources (8) Key activities (9) Key partnerships. See figure 8.

Figure 8: The Business Model Canvas depicting the nine building blocks


3.3 Pecking Order Theory

This theory was first postulated by economist Gordon Donaldson in 1961, in his article “Corporate Debt Capacity,” but was further developed by Myers & Majluf (1984). The summary of the theory is that information asymmetry causes the cost of financing to rise and internal sources of financing are always preferable to debt and equity. Subsequently, there is a particular order in which managers select sources of finance to fund their projects. So if there are only these three sources – Equity, Internal finance and Debt – available to management of a company, they would first finance with internal sources, then debt and may resort to equity as the last option (Myers, 1984).

The theory holds that because investors perceive that managers may have information that they do not have, investors would require a higher return on their investments, which in turn increases the cost of financing for the company (Myers & Majluf, 1984). For this reason, managers as much as possible refrain
from issuing new equity because that sends a signal to investors that managers would overprice their company assets prior to the share issue or the company may be in financial distress, hence the issue of additional shares (Baskin, 1989).

3.4 A Schumpeterian Model of Financial Intermediation

The Schumpeterian idea that financial institutions play key roles in entrepreneurial innovations that birth new products is not well known (King & Levine, 1993). According to Schumpeter (1934), financial institutions engender innovation by screening ‘promising’ entrepreneurs and then financing their innovations. He goes on to say that entrepreneurs seek to innovate in order to capture some ‘monopoly profits’ before competition catches on, hence financial institutions would only finance innovations that they perceive may result in above-market profit levels.

King & Levine (1993) reiterate Schumpeter’s idea of the key role played by financial institutions in appraising, managing and financing businesses. They also mention that investment decisions are made based on cost and benefit analysis. Subsequently, financial institutions mobilize funds from individual investors (surplus units) and finance the activity of the entrepreneur (deficit units) because financial institutions are able to do this more cost efficiently than individual investors can.

In the face of investment uncertainties, financial institutions increase the confidence of investors as well as influence the allocation of financial resources through investments (Levine, 2005). Their knowledge and access to information affect where people save. According to Levine (2005, p. 869), the financial system performs some activities that ultimately contribute to economic growth. These “activities are to

- Produce information ex ante about possible investments and allocate capital.
- Monitor investments and exert corporate governance after providing finance.
- Facilitate the trading, diversification, and management of risk.
- Mobilize and pool savings.
- Ease the exchange of goods and services.”
CHAPTER FOUR
METHODOLOGY

This chapter outlines the research paradigm, methods by which the research is conducted, and the reason for the choices made. It provides an overview of which cases are selected and why they were chosen for investigations and analyses with regards to the research question. It also shows how the interviews were conducted to collect data and the methods with which the responses elicited were analysed. The ethical issues that were taken into consideration during the research, in terms data collection and analyses, are also addressed.

4.1 Research Paradigm

A study’s research paradigm – positivist, interpretivist or a mix of the two – influences how scientific studies are carried out and reflects the belief systems and assumptions made by researcher about the world and knowledge in general (Collis & Hussey, 2013). The interpretivist paradigm is used in this study, hence financing of CE companies in Sweden is interpreted using inductive processes. Unlike positivism, which measures occurrences in society, an interpretivist approach is used because it does not substantiate a particular subject or method; rather, it probes to describe the subject based on the subjective view of the researcher.

4.2 Research Method

This research uses a case study method, answering questions of why and how some phenomena occur, which is ideal for investigations that require depth (Tellis, 1997). Case studies involve in-depth analysis of an organisation, person or group of people over time (Mekouar & Pohilj, 2015). This research studies the cases of Ragn-Sellsföretagen AB and Inrego AB to examine what the financing needs are and how they are being met, in terms of the implementation of their CE business model. ING Bank was selected during the discussion of the case findings to present more robust analyses. Secondary data was collected on the bank’s financing activities with CE companies.

Interviews were conducted by the researcher with both Ragn-Sellsföretagen and Inrego in order to collect high-quality and in-depth data from credible sources. An interpretive research paradigm works in tandem with qualitative data analyses, since the paradigm concentrates on an exploration of a social concept to understand it. Qualitative data analysis was chosen over quantitative data, because the latter uses large numerical data sets to test a hypothesis and draw generalized conclusions from results. This study, on the other hand, is exploratory in nature, tests no hypotheses, and seeks to apply results cautiously from the relatively small sample investigated to similar situations (Collis & Hussey, 2013).

4.3 Data Collection

Data collection began with the selection of Ragn-Sellsföretagen AB and Inrego AB as case studies. Through the triangulation of sources, qualitative data in the form primary and secondary data were collected on Ragn-Sellsföretagen and Inrego through interviews and online sources. Secondary data was collected on ING Bank through online sources mainly. Both CE companies are based in Stockholm, Sweden but have operations in other countries. ING Bank, which has an office in Stockholm, is a Dutch bank.
Noting that different researchers define CE differently, for the purpose of this research, a CE firm is one that operates on the principles of the 3Rs: Reuse, Reduce and Recycle. The study seeks to explore the financial assistance to CE firms; hence the selection of the bank for the analysis of the case studies. To present more robust analyses, it was intended to interview a firm that is linear in its use of resources and production; however the researcher was unable to find such a company that would agree to an interview on the time frame of this thesis project.

4.3.1 Primary and Secondary Data
Primary data is data that originates from original sources by the researcher, whilst secondary data originates from existing sources. Primary data in this thesis is collected through semi-structured interviews. The triangulation of sources in the collection of data allows the researcher to compare different viewpoints on the research question, in order to gain deeper understanding, effectively answer the research question and achieve the objectives of the research.

Prior to the commencement of each interview, interviewees were given a short introduction to the research and key terms were explained. Even though research questions had been designed and sent out before the actual interviews were conducted, the interview process was still flexible; the researcher still had control over the interview process, reigning in deviations from the research matter. The interviews with Ragn-Sellsföretagen and one with Inrego were conducted over the telephone and they lasted 30–45 minutes. The interviews were not recorded; the researcher took copious notes during the interviews. A second Inrego interview was conducted through email correspondence. The interview guide, interview notes and email exchange with Inrego and the parameters used in gathering the secondary data on the bank can be found in the Appendix.

Secondary data was gathered through desk research, with data collected from relevant academic literature, press releases and reports. The credibility of these sources is not guaranteed, especially the reports of professional institutions and interest groups, since such reports advance the group’s own cause. Peer-reviewed articles are more reliable.

4.3.2 Case Selection
The companies selected for the case studies as well as the bank whose secondary data was used in the analyses of the cases, were purposively selected. The selection was based on the researcher’s judgement and objectives, hence the researcher selected organisations that are well involved in the subject matter, interviewed people that are well informed on the research matter and also happy to be interviewees for the research (Palinkas et al. 2015; Given, 2008). Subsequently, in selecting cases and bank for analyses of this research, two points were taken into consideration.

The availability of information and data on the organisations studied in this research was very important; hence the researcher chose Ragn-Sellsföretagen AB, Inrego AB and ING Bank. On their websites, there is information on their operations and activities pertaining to the CE. In addition, data was collected from search engines like Google Scholar and Google. Moreover, they were available to be interviewed for additional data which could not be gathered from online.

Secondly, it was important to the researcher that the cases were credible and relevant to the research and answering the research questions. The organisations selected have shown that they are involved in the CE activities for the long haul, not just a short-term experiment.
4.3.3 Primary Data Analyses
Data gathered for this research is from case studies and interviews. In analyzing the qualitative data from the case study, descriptive frameworks are used together with pattern matching as explained by Yin (2013). Through the descriptive frameworks, the CE activities of the case subject are expounded. With the pattern matching, themes are developed from the case description to aid the analyses of the case data and answering the research question.

Data elicited from the interviews are analysed with a qualitative approach based on common themes from the interview guide. In analyzing the data, the notes taken during the interviews were first sent to the interviewees to be checked to be sure that they have not been misquoted and any errors are not present; and this ensures the credibility of the interview data (Gibbs, 2008).

The data analysis is continued through the three activities mentioned by (Collis & Hussey, 2013), that is (1) data reduction, (2) data display and (3) conclusions and verification of the accuracy of the conclusions. During the data reduction stage, the transcribed data is simplified and focused, with data that is less relevant to the research question is discarded. The data display stage is done concurrently with the data reduction stage, the portions of the transcriptions that are relevant to answering the research question is summarized and presented in matrixes and charts (Miles & Huberman, 1994). In order to draw conclusions, themes and patterns are identified from the reduced data, to help put the analysis in focus. The themes help with coding the results for better conclusions. A code in this setting is defined by Saldaña (2013) as a word or phrase that gives an important meaning to a portion of written or graphic data.

4.4 Ethical and Sustainability Issues
The ethical considerations taken into account during the course of this research follow the guidelines by Collis & Hussey (2013). The entire research processes, from the gathering of primary and secondary data to conclusions and recommendations, were carried out by the researcher. In gathering the primary data, interviewers were not compelled into taking part in the research; rather, they willingly agreed to be interviewed.

According to Miller et al. (2012), in the course of research physical harm, social harm or financial harm may inadvertently be done to subjects. This research did not include physical experiments; hence the concern about physical harm was eliminated. No other harm was done to the interviewees or their organisations resulting from the interviews. Nothing has been published without the express permission of the interviewees. The interview data collected has been treated as confidential information and has not been passed on without the interviewees’ permission.

The companies studied in this research contribute to a sustainable future through their CE activities, through recycling and refurbishing used electronic gadgets. The financial institutions studied are also doing their part by supporting the CE firms with financial services and products that support the CE business.
CHAPTER FIVE
CASE STUDIES

Following the thorough literature review and explanations of key concepts studied, in this chapter the researcher, through two selected cases, describes the financing needs of CE firms and how these needs are met. In addition, interviews are conducted to gather additional in-depth data from the companies studied in the case. Data from the interviews are analysed in themes together with secondary data from ING Bank, a global bank headquartered in Amsterdam, Netherlands.

The first case study is Ragn-Sellsföretagen AB, a Sweden-based recycling giant in Scandinavia and the Baltic region. The second is Inrego AB, one of the five most reliable brokers of used electronics in Europe. These organizations were chosen based on data availability and their activities in the CE.

5.1 Case 1 – Ragn-Sellsföretagen AB

Ragn- AB is a third-generation recycling giant in Scandinavia and the Baltic region, with its headquarters in Sollentuna, a suburb of Stockholm. Its corporate vision is “to be a living proof that caring for the earth and good business go hand in hand”, and its corresponding business strategy is “to offer innovative and effective solutions to minimize, manage and convert waste into resources.” See Appendix A for information on Ragn-Sells history.

The group has operations in six different countries: Sweden, Norway, Denmark, Estonia, Poland and Latvia. In addition, it has a separate consulting company called Ragn-Sells MiljöKonsult in Sweden, which offers consultancy services to customers across the group’s operations in all six countries. There is also the Ragnar Sellsberg Stiftelse (Foundation), set up in 1991 to support financially research and spread of knowledge in waste management. The group has permits and certifications like ISO 19001 & 14001. See Appendix B for management team of Ragn- Sellsföretagen.

In Sweden, the group’s business operation is divided into three departments—basic services, construction and hazardous waste—and segmented into three regions: north, south and central.

As seen in figure 9, in 2013, the 2.55 million tons of garbage processed by Ragn-Sells was in three classes: 10% being energy recycled to generate heating and electricity, 60% being material recycling from plastic, metal, glass, paper, tires, and construction waste and 10% being recycled biological waste to generate biogas and biodiesel for societal use. Another 10% goes to landfills and the remaining 10% is not treated in Ragn-Sells plants. Out of the 60% material recycling, 20% is used by Ragn-Sells in its plants for various purposes.

The chart on the right-hand side of the figure shows the percentages of waste gathered and recycled by Ragn-Sells in 2014, and that of 2013 is put in the brackets. Waste collected in 2014 was 2.55 million tons, the same as in 2013. Total household waste in Sweden for 2013 was 4.4 million tons.
In Table 1 below, the information in Swedish from figure 9 is translated into English:

<table>
<thead>
<tr>
<th>Swedish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samhälle - förbrukning</td>
<td>Society - Consumption</td>
</tr>
<tr>
<td>Energiåtervinning - fjärrvärme, el</td>
<td>Energy Recycling – heating, electricity</td>
</tr>
<tr>
<td>Materialåtervinning – plast, metal, glas, paper, elektronik, däck, jordar, konstruktionsmaterial</td>
<td>Material Recycling – plastic, metal, glass, paper, electronics, tires, soil, construction materials</td>
</tr>
<tr>
<td>Biologiskåtervinning - biogas, biogödsel</td>
<td>Biological Recycling – biogas, biodiesel</td>
</tr>
<tr>
<td>Deponi</td>
<td>Landfills</td>
</tr>
<tr>
<td>Behandling, Rening</td>
<td>Treatment, Cleaning</td>
</tr>
<tr>
<td>Brännbart, Organiskt, Trä</td>
<td>Combustible, organic, wood</td>
</tr>
<tr>
<td>Farligt avfall, Förorenade massor</td>
<td>Hazardous waste, contaminated soils</td>
</tr>
<tr>
<td>Icke farligt avfall, övrigt</td>
<td>Non-hazardous waste, others</td>
</tr>
</tbody>
</table>

Source: Ragn-Sells Sustainability Report (2014)

In 2014, the group turnover was 2.945 billion SEK, which fall short of the group’s target of a 7% growth in turnover over the 2013 total of 2.971 billion SEK. Operating profit in 2014 was 71 billion SEK, an increment of 2.4% over the operating profit of 2013, but still not up to the 8% target. In 2015, group revenue was 4.5 billion SEK. The group employs some 2,500 people who have a total of 1,600 vehicles at their disposal.
5.1.1 Ragn-Sells and the Circular Economy

Ragn-Sells aims to remove toxic materials (except nuclear waste) from the environment and contribute to the circular use of resources. To do this, the organization uses highly skilled staff and new business models to deliver innovative solutions and products to customers. The CE provides a way out of the old growth methods that create waste, by turning waste into resources for consumption. Currently in Europe, each resident consumes 15 tons of materials per annum, out of which 6 tons are recycled materials.

Through the CE principles, Ragn-Sells is contributing to a more sustainable future, where it treats waste and turns them into resources, like ‘ReUseOil’, biogas and heating for societal use again. Through its CE efforts, Ragn-Sells has not only protected the environment but also engendered competition which drives innovation in the organization and the solution it offers.

As a member of the Circular Economy 100, Ragn-Sells collaborates with the Ellen MacArthur Foundation, helping to develop new ideas and business models that result in a smooth transition to a society that uses resources efficiently. Ragn-Sells cooperates with other organizations like Easy Mining Sweden AB to clean phosphorus and other heavy metals, to recover and recycle phosphorus to reduce extraction of virgin resources. Together with Chromafora, Ragn-Sells purifies water in a cost-effective way, and reduces the amount of metals that have to be treated as hazardous waste. Ragn-Sells collaborates with Rent Dagvatten, Omo Industrisanering A/S, and universities to stay abreast with new knowledge in waste treatment in order to offer innovative products and solutions to customers.

5.1.2 Ragn-Sellsföretagen AB Interview Findings

Interviewee: Lars Tolgen, Research and Development Manager
Interview mode: Telephone interview. The text below is a summary of the key points made by the interviewee as interpreted by the researcher, based on detailed notes taken during the interview, and is not a verbatim transcript of his responses.
Date: May 16, 2016

Would you say your organisation uses a CE business model? Please explain.

Ragn-Sells uses a CE business model because, as part of its business operations, waste is converted into materials that are returned into the production cycle and harmful materials that cannot be recycled are removed from the cycle for disposal. Ragn-Sells evolved from being a haulage company to a waste collection company in the late 1990s, with waste collection forming about 60% of the business operations; now it forms about just 10% of the operations. Now the company is mainly into the treatment of waste into raw materials.

In what parts of your products and processes have the CE principles been applied?

CE principles have been applied in the organisational processes as well as the products and solutions offered to customers. As a company, Ragn-Sells strives to reduce the negative environmental impact of its own operations. In the haulage part of the company, improvements have allowed the company to use electric hybrid cars to reduce fuel consumption by 25% to 30%, whilst trucks that run on methane/diesel reduce fuel consumption by about 70%.

With regards to the products and solutions offered by Ragn-Sells, the company receives waste and treats it to make it materials for production. From its plant in Högbytorp, treatment of landfill gases is used to heat a nearby community called Bro.
Also from the plant in Halmstad, industrial oils waste is treated to become the award-winning-proprietary product called ‘ReUseOil’, which is resold to customers from whom the waste oils were collected. The ‘ReUseOil’ process was recognized and awarded by the EU environmental fund.

Do you receive any financial or other incentives to use a CE business model?

Ragn-Sells does not receive any incentives in order to implement the CE business model it runs; the motivation is intrinsic. The company does not receive any form of funding from government. To further complicate matters, the current legislations are about five to ten years behind the current trends in waste management. Some of the legislation and waste management taxes affect Ragn-Sells negatively, and time is spent with politicians and legal experts to educate them to make the necessary changes. However, changing taxation laws and legislation is a long-term work.

The company has evolved with time, and has invested in research and development in order to be in the position it is in now, to be able to employ new and innovative business models.

Describe the business model based on the following parameters:

Customer Segments: Real Estate and construction customers, Service companies in the energy sector and Household waste
Value Propositions: hauling materials, industrial cleaning, environmental consultancy services, waste collection, waste treatment, recycling, sales of materials
Channels: Haulage of materials on customer orders, Ragn-Sells staff work from the customers’ site
Customer Relationships: Direct contact with customers, 20% of Ragn-Sells staff work from customers’ premises
Revenue Streams: selling knowledge through the environmental consultancy services, payment from waste treatment, payment from selling treated waste, haulage
Cost Structure: Vehicles, waste treatment and personnel
Key resources: Personnel, trucks and permits for treatment plants
Key activities: Waste treatment, environmental consultancy, haulage, research and development
Key Partnerships: Easy Mining Sweden AB, Chromafora, Clean storm water, Rent Dagvatten and Omo Industrisanering A/S

What are the challenges to your business model?

The biggest challenges Ragn-Sells faces in implementing it business model is to find new means of transport and to further reduce the environmental impact from transportation. Keeping and monitoring landfills can be a very onerous task, and the company is continually researching means of reducing methane gas impact. Finding specialists in waste treatment is also a challenge.

Has your organisation had any financing needs over the last five years? Please explain those financing needs.

Ragn-Sells has had financial needs in the past five years, and they have been in relation to the development of plants and research and development for treatment processes.

How have these financing needs been met?
The financing needs have always been met, mostly from retained earnings. Also some of the company trucks have been sold off to finance some of these projects. Instead of owning the trucks, a part of the haulage of materials business is outsourced to other transport companies to perform that service.

How well have they been met? Please explain.

The financial needs are always met, but sometimes more can be done when larger sums of money are available. Sometimes the project done is constrained by the funds available.

Have banks met some of those financing needs over the past five years? Please explain how.

Because of the size of Ragn-Sells, banks are always willing to lend money to the company; however the company prefers to finance its projects with funds generated internally, like retained earnings and monies from the sale of its trucks. In the past five years, banks have met some of the financing needs of the company, though it is about 10%, since about 90% of projects are funded internally.

5.2 Case 2 – Inrego AB

Inrego AB was started in 1995 by two students, Henrik Nilsson and Rickard Hannerell, who wanted to sell affordable used computers to the student community in Lund, Sweden. Twenty-one years later, Inrego, with its headquarters in Stockholm, is now a market leader in the Nordic region, operating in seventy countries worldwide. Currently the company employs ninety people. The company handled 260,000 units of IT equipment, turned over 230 million SEK in revenues and 23 million SEK in annual profits for the 2014 fiscal year.

Inrego believes that “reusing IT is better than recycling” and subsequently derives its mission statement which is “is to minimise the impact of used IT equipment on the environment.” (Inrego.com)

Inrego buys used IT equipment that has been fully depreciated from the books of companies and public organizations, wipes the hard drive clean and refurbishes it for resale to schools, smaller companies, individuals and other companies who resell the computers. By building its wide network of suppliers and distributors, Inrego has been able to expand, and was nominated as one of the top five dealing companies with used IT in Europe.

Through the years, Inrego changed its name twice from Combac Data to Megabyt data then finally to Inrego. The founders of the company learnt over the years and from their business experiences that, the market is very dynamic and businesses must constantly evolve to remain in business and remain relevant to its customers. “A major part of working here is to question old truths and to come up with improvements. Nothing is sacred” is a popular saying in Inrego. The transition from serving a student-based customer segment to corporate customers proves this lesson, even though it was successful. The company has grown to include leasing of IT equipment and IT migration services in addition to its sales business, all in line with its mission statement (Inrego.com). Henrik Nilsson, a co-founder of the
company is the current chairman of Inrego. See figure 13 in Appendix C for the management team of Inrego.

5.2.1 Inrego AB and the Circular Economy
Inrego’s mission to reduce the effects of used IT equipment on the environment contributes to the CE and a more sustainable society through the reuse of IT equipment. Inrego believes that recycling is not effective when it comes to IT equipment; reuse is a better alternative. Inrego prolongs the product life of computers, mobile phones and other IT equipment by extensive repair and refurbishment, which usually doubles the product-life, enabling the products to be reused for a relatively longer time. Products that are considered not fit for reuse are not put up for resale but recycled.

In most business and government organizations, when IT equipment is completely depreciated in the company’s books, the used units are scrapped and given up to recycling companies for the materials to be recycled. This is in contradiction to EU waste hierarchy, which states that recycling should be the last resort after products have been reused.

According to the Kirby (2008), “240 kg of fossil fuels, 22 kg of chemicals and 1,500 kg of water” is required to manufacture a new unit of computer; hence reusing it ensures a more optimal use of resources as well as reducing carbon dioxide emissions. For every unit of computer reused, saves the environment 109 kg of carbon dioxide; 69 kg savings on laptops, 41 kg savings on LCD monitors and 27 kg savings on mobile phones.

5.2.2 Interview Findings from Inrego AB
From the researcher’s interviews with Erik Pettersson, Sustainability Manager, and Miguel Alijah, International Sales Manager, the following information was compiled to enable better analysis of the cases in the next chapter. As before, the text below is a summary of the key points made by the interviewees as interpreted by the researcher, based on detailed notes taken during the interviews, and is not a verbatim transcript of their responses. See the Appendix F for the researcher’s notes from each individual interviewee.

What is the problem your organisation is solving, and/or what solution is it offering?

_Inrego buys used IT equipment from companies and public organisations, repair it, wipe all information from the computer and resell to schools, smaller companies, private persons and other companies who resell used IT equipment. Inrego is solving the e-waste problem in society, protecting the environment and preventing the waste of money on purchase of new IT equipment. Inrego takes care of the environment by prolonging product life. In Sweden, people usually use computers for three to four years, then replace it with new ones. However computers are manufactured to last for ten years._

How do you define your impact on society?

_Environmental impact_
We are replacing the manufacturing process of a computer when we repair it for reuse. This saves the environment 109 kg of CO2 (carbon dioxide) emissions per unit of computer when it is reused.

_Changing behaviours in Society_
Through public relations, the media, our conferences, we change people’s attitudes towards second-hand IT equipments and encourage them to buy used IT equipment instead of buying new ones._
What is your understanding of the CE and its principles?

The CE is a good thing. It shows you how to make business out of saving the environment.

How does the organisation talk about the CE in its communications?

We refer to the CE in our communications with our customers on our websites and during our conferences.

Would you say your organisation uses a CE business model? Please explain.

Yes. We resell used computers and we try to get it back from the people we resell it to.

In what parts of your products and processes have the CE principles been applied?

In our customer offering to our customers, we repair used IT equipments and resell them. We lease out IT equipments to our customers.

Do you cooperate with outside organisations for the implementation of the CE through your business operations?

We cooperate with transport companies like Postnord that collect used computers from their first users and also deliver refurbished computers that have been ordered by new users. Sims Recycling Solutions is a recycling company that we deliver ‘unreusable’ IT equipments to for recycling.

Do you receive any financial or other incentives to use a CE business model?

We do not receive any financial support from the government or any subsidies on our operations. We are fully self-supported. It has to be this way; else we cannot say we are using CE business models if it is not self-sustainable and we need support.

Can you describe your business model based on these 9 parameters?

**Customer Segments:** Public Organizations like Government institutions and Municipalities, Schools, Small companies, IT equipment retail companies, private users

**Value Propositions:** eco-friendly IT equipment, low-cost IT equipment, high quality IT equipment

**Channels:** Company website, one-on-one

**Customer Relationships:** Direct contact with customers, company website

**Revenue Streams:** selling refurbished computer and other IT equipments, renting and leasing of IT equipments and turnkey data migration services

**Cost Structure:** Personnel, buying computers and IT equipments

**Key resources:** Personnel, data wiping software

**Key activities:** Receiving in-coming used computers, security (producing data wiping certificate to sellers of used computers), selling refurbished computers, environmental communications (communication with sellers of used computers and IT equipment and buyers of refurbished computers) on CO2 emissions savings reports on how the business is helping the environment

**Key Partnerships:** Sims Recycling Solutions, Blancco – data wiping software

What are the challenges to your Business Model?
Finding enough used computers to purchase or convincing companies to sell their used computers that have been fully depreciated to us, rather than just throwing them into their basement. We always have to get a minimum of ten computers from each organization that wants to sell its used computers to us, else it is not a profitable transaction, considering the cost of transporting the computers from the supplier to our offices.

Has your organisation had any financing needs over the last five years? Please explain those financing needs

No, we have not had need for credit, we have been financed internally. We do have a banking relationship, but we do not have loans from them. We own this premises in Taby, so it is possible there is a mortgage loan on it. But I cannot say for sure.

5.3 ING Bank

ING is a global bank with a strong presence in Europe, serving personal, retail, commercial, corporate, institutional and governmental clients in 40 countries. ING aspires to place customers at the centre of everything it does. In 2015, its 54,000 employees served 34.4 million customers. The bank is known for its strong financial position, strong distribution channels and wide international network.

The bank’s purpose is to “empower people to stay a step ahead in life and in business” by creating sustainable progress that is powered by staff and customers, with ingenuity. The bank, through its strategy of creating a differentiated customer experience, has made its banking activities simple and easy, constantly improving its operational excellence, other internal processes and lending activities (ING Bank, 2016).

ING divides its markets into four main areas: the Benelux (Belgium, Netherlands and Luxemburg), Challengers (Germany, Spain, France, Italy, Australia and Austria), Growth markets (Poland, Romania, Turkey and the offices in Asia) and Wholesale markets (business units in the U.S, Mexico, South America, Scandinavia and the global franchises) (ING Bank, 2016). See figure 10 below.

Figure 10: ING Bank global presence and offices

![Map of ING Bank's global presence and offices](image)

Disclaimer: Please note that ING Bank does not have a banking license in the US and is therefore not permitted to conduct banking activities in the US. Through its wholly owned subsidiary ING Financial Holdings Corporation and its affiliates, ING offers a full array of wholesale financial products such as lending, corporate finance and a full range of financial markets products and services to its corporate and institutional clients.

Source: ING Bank, 1st Quarter 2016 Report
Under the management of Ralph Hamers as ING’s CEO in 2015, the bank made profit after tax of 4.2 million Euros, which was a 23.2% increase over the 2014 net profit. The bank’s share price increased by 15% and the return on equity was 10.8%, an increase from 9.9% in 2014. The cost to income ratio improved from 58.7% in 2014 to 55.9% in 2015. See figure 11 below. In Europe, ING emerged as fourth largest bank in terms of market capitalization, with 48 billion euros.

Figure 11: Key performance indicators of ING Bank

![Figure 11: Key performance indicators of ING Bank](image)

Source: ING Bank, Annual Report 2015

5.3.1 ING Bank and the Circular Economy

Sustainability forms an integral part of ING’s corporate strategy. The bank is among the leaders in the industry group in the FTSE4Good Index and in the Dow Jones Sustainability Index (Europe and world), where the bank’s shares are listed (ING Bank, 2016).

The information below is gathered from the ING Bank website on the bank’s activities on the CE through its publications and articles (ING Bank, 2015; 2016). Some of it is paraphrased from videos from a March 10, 2016 conference, organized by the bank’s wholesale banking department, the Dutch embassy in London and Green Alliance. The conference gathered managers who make financial decisions in their companies to deliberate on the transition to the CE, the associated business models and financing for CE business models (‘Finance, the catalyst to the circular economy ’).

Below, the researcher classified the information from the conference under headings that aid analysis of the case study in the next chapter, but note that an interview was not conducted with ING.

The bank’s understanding of the CE and its principles

*In ING’s opinion, the CE is the solution to environmental degradation and depletion of economic resources. Through the CE principles of ‘reduce, reuse and recycle’ companies can reconsider the entire lifecycle of their products and the resources consumed in producing these products,*
hence decoupling economic growth from resource consumption and environmental impact. Moreover the CE concept is inspired by nature, where there is no waste. However it is important to mention that the CE is more than recycling. This has necessitated the development of innovative business models, called circular business models, which incorporate the CE principles of ‘reduce, reuse and recycle’, in order to adapt the traditional business models. This has become necessary among other reasons because businesses are constrained in terms of energy supply, land and material availability, volatile prices of raw materials and pressure from consumers and other groups for more sustainable business operations.

Criteria used to determine if a company has a CE business model

A company is classified having a CE business model when in its economic activities:
- use fully renewable, recyclable or biodegradable resource inputs – circular supplies
- extend the product life cycle – waste as a resource, recycling
- offer a product as a service – performance economy, servitization
- promote collaborative consumption through sharing platforms – sharing, CC
- recover resources at the end of a product life cycle – remanufacture, repair, resell

Clients or partners of the bank using a CE business model

(The researcher identified a number of companies in the report ‘Rethinking finance in a circular economy - ING Group analyses’ and presentation by Christopher Steane, head of wholesale banking, ING at the conference on March 10, 2016.)
- BMA Ergonomics

Their share as a percentage of the total number of the bank’s overall clients

17% of the whole sale lending clients of ING is considered sustainable by the bank’s own sustainability test. The share has been growing.

Services the bank offers to companies using a CE business model

In the case of large companies, the bank supports their supply chain by financing smaller suppliers within the chain or other partners in the value chain who the client identifies as necessary for the effective working of CE business model. As a bank, ING finances cash flows not assets; no business asset is worth anything unless it is creating cash flows.

Financial or other incentives motivating the bank to work with CE companies

The banks own data that combines sustainability and economic performance and the loan books being managed now shows a positive correlation. ING acknowledges that sustainability pays, so the CE is a large business opportunity and it is the business of the future. The bank also recognises the demands that society puts on financial institutions to finance the low carbon economy, which requires financing running into trillions of dollars and wants to contribute to the targets in ‘our common future’. It is the bank’s aim to support its clients to stay a step ahead in business and in their lives.

How the bank is preparing for these changes
ING is developing their leasing products to answer more CE business request by expanding products to new asset categories, extending existing policies, even though the bank has a strong risk based policies due to episodes that happened in the past.

Instances in which the bank encountered challenges in meeting the financing needs of CE customers

A startup wanted to go into the building of long life temporary housing using wood which is more sustainable than steel. ING was not able to support it because the bank when it lends, wants to know that the business model is reasonably robust and tested, with a management team with a great track record. Until the business model is proven and to prove that the market is willing to pay for these sustainability shelters, they would have to team up with more established entities to be able to underwrite the future value of temporary shelters at the point when they are redeployed.
CHAPTER SIX
DISCUSSIONS AND CONCLUSIONS

In the following sections, the case studies are analysed in the light of the theories listed in the analytical framework of this research. In addition, information from ING Bank on their financing activities of CE companies is used to ensure a more robust analysis and to improve the credibility and validity of the findings. After discussing the findings, the research is concluded and recommendations are made for future research.

6.1 Discussions

6.1.1 Financing need is a function of the business model building blocks

Businesses incur expenses in delivering their value propositions to their customers (Osterwalder & Pigneur, 2013), and the type of product or service being delivered to customers determines whether or not businesses may need financing support from external organizations like banks. Apart from the recurrent operational expenditures incurred in delivering the customer value proposition, Ragn-Sells in the past five years has had financing needs that were capital expenditures related to their landfills, developing plants for the treatment of waste and research and development into their treatment processes.

Interview findings from Inrego revealed that the company has not had any financing need that has required external sources of funds. Its financing needs over the last five years have been operational in nature, not capital expenditures. The interviewee, however, mentioned that the current premises of the company is not rented but owned by the company, and could possibly be financed with a mortgage loan, but the interviewee could not say for sure.

The cost of setting up a brand new waste management plant or of conducting renovations on an existing one is higher than the cost of data-wiping software; hence the amount and type of financing need vary based on the company’s value proposition to customers. Ragn-Sells and Inrego revealed that the largest recurrent cost incurred pertains to staff costs, in paying salaries and benefits.

Data from ING Bank reveals that this bank does not finance business assets but cash flows. The bank has financed CE companies indirectly, by financing smaller companies within the CE company’s value chain. By financing the CE company’s key partners like suppliers, the bank helps ensure that the suppliers are able to give trade credit to the CE company, which is a source of finance.

6.1.2 The business is mostly financed from internal sources of finance not banks

According to Lintner (1956), on average, companies “plough-back” about 50% of their earnings for investment purposes, and if it is not enough, management may resort to other sources of finance. In accordance to the pecking order theory postulated by Myers (1984) and Myers & Majluf (1984), internal sources of finance are generally preferable to external sources; and when internal sources of finance are not enough, companies usually issue debt instruments or access loans from banks. Issuing new equity is the last resort.

Ragn-Sells is financed about 90% with internal funds and 10% from financial institutions. Ragn-Sells has been financed with retained earnings and sales of some of its trucks. Even though the trucks have
been sold because the company has been thinning out its haulage business and needed to dispose of some of its trucks, the sales from trucks were used to finance company projects.

Inrego is financed entirely with retained earnings; no credit has been accessed from financial institutions.

6.1.3 The biggest challenge to the CE business model is not finance

From the interviews with both Ragn-Sells and Inrego, the researcher found that the biggest challenge to their business models was not related to financing. The researcher discovered that these CE business models are self-financing, and both companies finance their projects with retained earnings.

The biggest challenge faced by Ragn-Sells in implementing its circular business model is finding new means of transporting and further decreasing the environmental impact from the transportation of waste for treatment. Keeping and monitoring landfills can be a very onerous task, and the company is continually researching means of reducing methane gas impact from these landfills.

Inrego faces challenges when it comes to finding enough used computers and IT equipment to purchase or convincing companies to sell their used computers and IT equipment that have been fully depreciated.

6.1.4 Companies have built up earnings that have been used to finance the CE business model

Ragn-Sells began in 1881 as a haulage company. It added waste collection and recycling much later. Now waste collection is a small part of the business, and waste treatment forms a major part of the company’s operations, while environmental consultancy is growing too. Its business model has worked over the years and has kept the company profitable. The company foresees a time when it will only be offering consultancy services for waste treatment; its clients may treat their own waste based on the knowledge supplied by Ragn-Sells.

Inrego has also changed some of the building blocks of its business model and added more elements to some of the building blocks. For instance, it has included renting and leasing of the computers and IT equipment instead of just selling. It has also started offering turnkey and data migration services to its customers.

Schumpeter (1942) coined the term “creative destruction” to describe the process in which an entrepreneur combines the factors of production in innovative ways that invent new products and processes. Over the years, these companies have invented new ways of conducting their business or new product offerings and have survived the pressures in their external business environment.

ING turned down a request from an entrepreneur for financing of a CE business that builds long-life temporary shelters using renewable materials. The bank turned it down because the business model is not tested for robustness and they could not vouch for the track record of the management team. Moreover, it has not been proven that the market would be willing to pay for these shelters.

6.1.5 Banks are not partners with CE companies in implementing the CE business models

Key partners, according to the Business Model Canvas of Osterwalder & Pigneur (2013), are external organizations that provide services that are critical to the value creation process of the business. From this definition, banks are not partners with businesses in delivering value to their customers; however banks may finance a business’ activities through capital expenditure or supply chain financing. When a
bank finances a business, it does not make the bank a partner to that business, unless specific provisions have been made to that effect through a contract.

For Ragn-Sells, its key partners are companies that help it in the treatment of waste and management of its landfills. It is noteworthy that here that not one mention is made of any financial institutions, even though as a company it of course has relationships with banks.

Inrego admits to having banking relations and may even have a mortgage loan over the company’s current business premises; however, it does not consider bankers as key partners.

6.1.6 Banks are willing to support CE business models

According to Schumpeter’s model of financial intermediation, financial institutions assess entrepreneurial innovations and then gather money from the surplus units in society to finance the entrepreneurs.

ING is motivated by its own mission statement to support clients to always stay a step ahead in their business and in their personal lives. From the bank’s own databases and loan books, it has observed a positive correlation between sustainability and economic performance, although the researcher notes that correlation does not imply causality. Managers in the bank have indicated that there are sustainable business opportunities associated with the circular economy.

ING managers acknowledge that financial institutions are expected to finance the low-carbon economy, which requires investments of about $89 trillion from 2014 to 2030, according to one estimate (The New Climate Economy Report, 2014). In the “Our Common Future” report by the Brundtland Commission of the UNWCED, sustainability targets were set, and ING as a bank wants to contribute to achieving these targets. The bank is developing its current products on leasing and also expanding their products and service offerings to new asset categories that serve the CE and the associated business models.

In the past, ING may have given loans that went bad, and subsequently the risk policies of the bank have been tightened to prevent such episodes. These risk-based policies are being further extended, due to innovative business models that are associated with the CE, some of which are not time-tested.

6.1.7 These CE companies do not receive any financial support or subsidies from government

CE business models, like other business models, must be able to give the business an advantage over its competitors through the business model building blocks. The business model shows the firm’s rationale for creating, delivering and capturing value, according to Osterwalder & Pigneur (2013). Profit-making businesses should be able to generate enough profit to stay in business.

Ragn-Sells does not receive financial support from any institution or government agencies for the CE business models or activities that the company takes part in. The motivation to run the CE business model comes from the company’s vision, which states that taking care of the environment and successful businesses go together. They consider their business operations rather hampered by current laws that are not abreast with current trends in waste management. Legislation on waste management and tax laws on landfills affect the business operations adversely, and important working hours are dedicated to educating public officials about the necessary changes required to support the CE business models.
Inrego does not receive any financial support or subsidies from government bodies or agencies, and its managers have indicated that such independence is necessary if CE business models are to be self-sustaining. They have indicated that if their business needed financial support from the government to remain in business, then they would not be using a CE business model. According to Stahel (2014), prolonging product life through reuse and repair can become a profitable business that becomes a source of employment.

6.2 Conclusions

The purpose of this research was to contribute to knowledge on the fledgling CE concept and its associated new business models. The research aimed to investigate what the financing needs of CE companies are and how they are being met. Secondly, the research investigated how banks in Sweden are partnering with businesses that are moving towards the CE in meeting their financial needs, given the innovative business models of CE firms.

The findings suggest that financing is not the biggest challenge in implementing the CE business models of both companies analysed in this research. Data from the bank also showed its willingness to lend to CE companies, so long as the business model generates sustainable cash flows. The business models of the case study companies have been financed by internally generated funds, especially retained earnings and voluntary sale of assets. In these cases, under current circumstances it seems there is not much for banks to do in financing CE companies.

Secondly, the research revealed that the specific financing needs and the amount of finance needed by a company in implementing its CE business model depends to a large extent on the value proposition the company offers to its customers and cost structure. A company that is into a capital-intensive business like waste management may have relatively larger financial needs than another company that is into retailing of consumer products like computers.

The biggest challenge to the CE business models of the companies studied is related to logistics. The biggest challenge relates to managing their supply chain to get the right minimum quantities of stock needed at all times to make the retail process profitable for both companies. Another challenge is finding enough skilled personnel to work in continuously innovating. Legislation and tax laws have inadvertently challenged the CE companies, according to the interviewees.

Since financing is not a challenge in implementing the CE business models for these companies under current circumstances, and direct financial aid from government may imply that the business models are not self-sustaining, indirect government support in the form of favorable tax legislation may help CE business models to survive in the long term.

Moreover, it appears that the attitudinal change of consumers towards second-hand products and green-labeling of products to indicate environmental savings from using that product would help CE companies. It is important for CE companies to continue investing in research and development to continue being innovative with their business models.

The scope of this research was limited to financing CE companies that deal with reducing and managing waste and a bank that operates in Stockholm. These delimitations have implications for how the findings can be generalized to other CE companies in other industries or parts of the world.
6.3 Limitations

No interview was conducted with any company that operates on the traditional linear economy model. This is mainly due to the inability of the researcher to find one that would agree to an interview within the timeframe of the thesis. This could reduce the credibility of the findings. In addition, the researcher was unable to obtain information from the bank on the specific financing products given to CE companies that differ from what is offered to linear economy companies.

The relatively short duration within which this research was carried out, about eight weeks, created challenges in gathering and analysing primary and secondary data. An extensive literature review was necessary for gathering secondary data, but time constraints limited the extent of the literature review.

In the interpretivist paradigm, reliability of results is not of utmost importance; hence results may differ when the study is repeated by another researcher (Collis & Hussey, 2013). The success of the associated interview method of gathering data hinges on how experienced the researcher is (Boyce & Neale, 2006). In addition, interviewees may give biased or incorrect answers in an attempt to be perceived as polite. This is called “social desirability bias,” and it may result in research results that are deceptive (Fisher, 1993; Randall & Fernandes, 1991).

6.4 Recommendations for Future Research

In case studies, analyses of findings are mostly limited to the facts of the organization(s) being profiled. In the future, research may widen the scope to include more companies, and firms from other industries. The use of quantitative data with regards to financing of CE companies, as well as interviewing more CE companies, could be another way to widen the scope of future research.

This research showed that the main challenge to the business models of the CE firms studied is not finance, hence future research could endeavour to understand the main challenges faced by CE companies and linear economy firms transitioning to CE business models.

Future research could explore the different finance providers and financing options available to CE companies.

Further research can also be conducted to ascertain if findings from this research are applicable to other geographical areas. Moreover, all the three organizations that were used in this research do not have business operations in Africa, despite presence in all other continents of the globe. Future studies may consider companies with operations in African markets.

This research analysed CE companies that work on reducing the amount of waste created or managing the effects of waste on the environment, in terms of the 3Rs implementing ‘reuse’ and ‘recycle.’ Future research may study businesses that operate in the sharing economy, which have completely different cash flows from ‘recycle’ and ‘reuse’ companies.
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APPENDICES

Appendix A: Ragn-Sellsföretagen AB through the years

The company is a family business that was started in 1881 by Amandus Zachariah Leonard Sellberg as a horse haulage company, Sellbergs häståkeri, in Odengatan, Stockholm. By 1928, at Väderholmens gård in Sollentuna, Ragnar Sellberg, son of Amandus Zachariah Leonard Sellberg, started a garbage collection business in Sollentuna, which ran alongside the family horse haulage company in Odengatan. In 1933, Ragnar became the CEO of the group and in 1968, the group name changed from AZ Sellbergs Åkeri AB to Ragn-Sells AB. Throughout these years, waste management formed just a small part of the business operations as compared to the haulage business of the company, however it was still the biggest waste management company in Sweden during these years. Ragnar Sellberg resigned as CEO to be the group chairman in 1973. In 1989, a company in Oslo, Norway that specialises in industrial cleaning called Norsk Renovasjon AS was purchased by Ragn-Sells, and this was the beginning of acquisitions and other expansion that moved the company to international markets.


Within Sweden, Ragn-Sells has expanded through acquisitions and diversifying its customer offerings. One important point in the company’s history was in 1992, with the privatization of Malmö’s sanitation works, the largest in the country at the time. In 2007, TRAAB, Vanersborg together with its landfill and optical technology sorting of household waste was acquired, in 2010 Selectiva in Småland and in 2012, Reaxer environment in Jämtland was acquired.

In 1995, the first plant for 100% recycling of waste from the construction industry, RentBygge, was inaugurated and set into operation. In 1998 and 1999, Sweden’s first waste recycling systems were developed for homes and shopping malls, respectively, and by this time the company’s turnover was growing.

Appendix B: Ragn-Sellsföretagen Corporate Governance

The commencement of the company can be traced back to 1881, as a family business and in 2016 it is still a family business comprised of a group organization called Ragn-Sellsföretagen AB located in Sollentuna, Sweden and six subsidiaries. The subsidiaries are Ragn-Sells AB, Sweden, Ragn Sells A / S, Denmark, Ragn-Sells AS, Norway, Ragn-Sells Estonia AS, Ragn-Sells Polska Sp. Zoo, Poland and SIA Ragn Sells, Latvia.

Each subsidiary is operated independently with its own management team, but is able to draw on a shared knowledge base developed within the group. At the top of the organizational chart is the Board of Directors, followed directly by the CEO of the group, then the various group functional heads. See figure 12 below.
Figure 12: Group Management and Corporate Staff of Ragn-Sellsföretagen AB

Source: Ragn-Sellsföretagen AB

Appendix C: Management Team of Inrego AB

Figure 13: Management Team of Inrego AB

Source: Inrego.com
Appendix D: Interviewees

1. Lars Tolgen – Research and Development, Ragn-Sellsföretagen AB,
2. Erik Pettersson – Sustainability Manager, Inrego AB
3. Miguel Alijah – International Sales Manager, Inrego AB

Appendix E: Interview Guide for Ragn-Sellsföretagen AB and Inrego AB

1. What is your title in this organisation?
2. What is the size of the organization in terms of *employees and *annual revenues *profits? (if you are able to share that)
3. What is the problem your organisation is solving, and/or what solution is it offering?
4. How do you define your impact on society?
5. What is your understanding of the CE and its principles?
6. How does the organisation talk about the CE in its communications?
7. Would you say your organisation uses a CE business model? Please explain.
8. In what parts of your products and processes have the CE principles been applied?
9. Do you cooperate with outside organisations for the implementation of the CE through your business operations?
10. Do you receive any financial or other incentives to use a CE business model?
11. Can you describe your business model based on these 9 parameters?

(1) Customer Segments  (2) Value propositions   (3) Channels   (4) Customer Relationships
(5) Revenue Streams   (6) Cost structure   (7) Key resources   (8) Key activities (9) Key partnerships

12. What are the challenges to your Business Model?
13. Has your organisation had any financing needs over the last five years? Please explain those financing needs
14. How have these financing needs been met?
15. How well have they been met? Please explain?
16. Have banks met some of those financing needs over the past five years? Please explain how.
17. What percentage of your financing needs is met by banks over the past five years?
18. What are the other sources of finance for your capital expenditures and operational expenditures? Explain.

Appendix F: Interview Notes

Interviewee: Erik Pettersson, Sustainability Manager, Inrego AB
Interview Mode: Telephone Interview. The text below is a summary of the key points made by the interviewee as interpreted by the researcher, based on detailed notes taken during the interview, and is not a verbatim transcript of his responses.
Date: May 17, 2016

What is the problem your organisation is solving, and/or what solution is it offering?

Inrego buys used IT equipment from companies and public organisations, repair it, wipe all information from the computer and resell to schools, smaller companies, private persons and other companies who resell used IT equipment.
Inrego is solving the e-waste problem in society, protecting the environment and preventing the waste of money on purchase of new IT equipments.
Inrego takes care of the environment by prolonging product life. In Sweden, people usually use computers for three to four years, then replace it with new ones. However computers are manufactured to last for ten years.

**How do you define your impact on society?**

*Environmental impact*
We are replacing the manufacturing process of a computer when we repair it for reuse. This saves the environment 109 kg of CO2 (carbon dioxide) emissions per unit of computer when it is reused.

*Changing behaviours in Society*
Through public relations, the media, our conferences, we change people’s attitudes towards second-hand IT equipments and encourage them to buy used IT equipment instead of buying new ones.

**What is your understanding of the CE and its principles?**

_The CE is a good thing. It shows you how to make business out of saving the environment._

**How does the organisation talk about the CE in its communications?**

_We refer to the CE in our communications with our customers on our websites and during our conferences._

**Would you say your organisation uses a CE business model? Please explain.**

_Yes. We resell used computers and we try to get it back from the people we resell it to._

**In what parts of your products and processes have the CE principles been applied?**

_In our customer offering to our customers, we repair used IT equipments and resell them. We lease out IT equipments to our customers._

**Do you cooperate with outside organisations for the implementation of the CE through your business operations?**

_We cooperate with transport companies like Postnord that collect used computers from their first users and also deliver refurbished computers that have been ordered by new users. Sims Recycling Solutions is a recycling company that we deliver ‘unreuseable’ IT equipments to for recycling._

**Do you receive any financial or other incentives to use a CE business model?**

_We do not receive any financial support from the government or any subsidies on our operations. We are fully self-supported. It has to be this way; else we cannot say we are using CE business models if it is not self-sustainable and we need support._

**Can you describe your business model based on these 9 parameters?**

_Customer Segments:_ Public Organizations like Government institutions and Municipalities, Schools, Small companies, IT equipment retail companies, private users
Value Propositions: eco-friendly IT equipment, low-cost IT equipment, high quality IT equipment
Channels: Company website, one-on-one
Customer Relationships: Direct contact with customers, company website
Revenue Streams: selling refurbished computer and other IT equipments, renting and leasing of IT equipments and turnkey data migration services
Cost Structure: Personnel, buying computers and IT equipments
Key resources: Personnel, data wiping software
Key activities: Receiving in-coming used computers, security (producing data wiping certificate to sellers of used computers), selling refurbished computers, environmental communications (communication with sellers of used computers and IT equipment and buyers of refurbished computers) on CO2 emissions savings reports on how the business is helping the environment
Key Partnerships: Sims Recycling Solutions, Blancco – data wiping software

What are the challenges to your Business Model?

Finding enough used computers to purchase or convincing companies to sell their used computers that have been fully depreciated to us, rather than just throwing them into their basement. We always have to get a minimum of ten computers from each organization that wants to sell its used computers to us, else it is not a profitable transaction, considering the cost of transporting the computers from the supplier to our offices.

Has your organisation had any financing needs over the last five years? Please explain those financing needs

No, we have not had need for credit, we have been financed internally. We do have a banking relationship, but we do not have loans from them. We own this premises in Taby, so it is possible there is a mortgage loan on it. But I cannot say for sure.

Interviewee: Miguel Alijah, International Sales Manager, Inrego AB

Interview Mode: Email Interview (edited for grammatical errors)

Date: May 19, 2016

What is your title in this organization?
International Sales Manager

What is the size of the organization in terms of *employees and *annual revenues *profits? (if you are able to share that)
90 employees; 250 million SEK/year

What is the problem your organization is solving, and/or what solution is it offering?
“We help organizations recycle their IT equipment and reduce their CO2 emissions. We call it Reinventing IT”. Reuse IT before recycle in order to reduce the ecologic impact reducing the CO2 emissions.

How do you define your impact on society?
Inrego helps society to reduce CO2 emissions and help to recycle and reuse contaminant components as electronics. Inrego is aware of ecological impact of the waste we produce and
What is your understanding of the CE and its principles?
The main principle of CE is an industrial economy with no waste and pollution where the materials and extra resources are reused inside the company.

How does the organization talk about the CE in its communications?
The concept if CE is still complex to explain and share between our clients and partners. We describe the “what, why, and how” we do without specifying exactly what is a CE.

Would you say your organization uses a CE business model? Please explain.
Yes

In what parts of your products and processes have the CE principles been applied?
Inrego helps companies to properly waste their old IT equipment. We offer several services as logistics, data protection/erase, and guarantee and security ISO Certifications. Then, we refurbish the units which can be reused by national or international markets. These units will arrive to the domestic market and they will be used again after we process them. Those which cannot be reused will be properly recycled.

Do you cooperate with outside organizations for the implementation of the CE through your business operations?
Yes. We cooperate with suppliers and clients to keep the extra resources and used IT inside the business operations, recycling those units which life –cycle is done and refurbishing those units which are still valid to use.

Do you receive any financial or other incentives to use a CE business model?
No

Can you describe your business model based on these 9 parameters?
(1) Customer Segments - Individuals, companies, medium and big distributors  
(2) Value propositions - Low price, eco-friendly and high quality IT equipment  
(3) Channels - Big distribution internationally – Internet for the Local Swedish Market  
(4) Customer Relationships - Long term relationships as a big volume supplier – high quality technical support as a retail business  
(5) Revenue Stream - National and international sales of IT units together different IT services during the processed of the equipment  
(6) Cost structure - High volume costs with big stocks and facilities  
(7) Key resource - Big companies which renovate their IT equipment periodically (every 3-5 years)  
(8) Key activities - Asset IT recovery, international sales, national sales, IT refurbish, recycle of the unit which have no longer life-use  
(9) Key partnerships - Big IT renting companies and new IT distributors

What are the challenges to your business model?
To convince the companies that giving a reuse-second life to their IT equipment is better and better for the environment than recycling.

Has your organization had any financing needs over the last five years? Please explain those financing needs
The main financing need is the storage stock to ensure the chain supply. Big capital has to be immobilized to ensure big stocks which provide the market demand.

How have these financing needs been met?
The company increased its capital investment and work with loans from banks, amounts which are periodically revised.

How well have they been met? Please explain.
The company currently has several partnerships with different investors and banks, which provide with enough capital to supply the stock rotation.

Have banks met some of those financing needs over the past five years? Please explain how.
Yes. The company proved its solvency and good results for the last 20 years, which enhance its position and increase the trust of the banks on us.

What percentage of your financing needs is met by banks over the past five years?
I don’t have that information.

What are the other sources of finance for your capital expenditures and operational expenditures? Explain.
The financial sources of the company apart from banks are: own sources of the company (after 20 years of operations) and private investor sources (these are normally temporary and signed with short-terms contracts).

Appendix G: Questions used in collecting secondary data on ING Bank
1. What is the bank’s understanding of the CE and its principles?
2. What criteria are used by this bank to determine if a company has a CE business model?
3. Are there companies using a CE business model among the bank’s clients or partners? If so, how many?
4. Is the bank able to estimate their share as a percentage of the total number of its overall clients, or the total amount financed?
5. Has this share been growing over time?
6. What are the services that the bank offers to companies using a CE business model?
7. Does the bank have any internal policies that encourage or require that it work with CE companies?
8. How is the bank preparing for the changes that the transition to circular business models brings?
9. Have there been instances during which the bank successfully met the financing needs of CE customers?
10. Have there been instances during which the bank encountered challenges in meeting the financing needs of CE customers?