



# CHALMERS

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## **Circular Business Model as an approach to deliver sustainable transport solutions**

Investigating internal capabilities and competences needed, as well as risks and barriers hindering implementation of a Circular Business Model

*Master of Science Thesis*

*in the Quality and Operations Management Programme*

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## Abstract

The prevailing consumption pattern in the world is not sustainable. The global industrial system is by 2050 expected to double its output (Bocken et al., 2013). Additionally, the world population is expected to reach more than 9 billion by 2050 (Beltramello et al., 2013). Increased consumption has and will lead to an increased strain on the resource extraction and the resource utilization. The current system of global economy has since the industrial revolution more or less followed a linear approach, built around an idea of endless supplies of resources. Recent price climbs for resources has presented companies with a reason to question the current linear approach. A concept within sustainability that in recent times has gained interest is the Circular Economy, which is centered on effective resource utilization that maximizes the value extracted from the resources. In the circular economy, resources are kept in the value chain over a longer period of time, and through a number of returning loops resources are reentered in the value chain enabled to be utilized again and again.

The Research Support Office at Scania initiated this thesis due to an interest in if it would be possible for Scania to, with the use of performance sales, deliver more efficient transport solutions through the use of a circular business model. The researchers conceptualized the thesis by forming a purpose and stipulating research questions. In short the research consisted of four parts. The first part consisted of the mapping of Scania's current business model. The mapping was kept on a general level in order to fit a broader mass of the business areas within Scania's truck segment. The second part was dedicated to creating a circular business model that is based on performance sales. As a third part, the current business model and the circular business model were then compared. The comparison revealed differences and these differences were broken down into capabilities and competences that Scania was currently lacking or needed to develop even further. The final part was to identify risks and barriers connected to a move to the circular business model.

The differences revealed a need for a deeper understanding of the customers' needs and also the working environment of the customers. The fact that Scania in the circular business model will retain ownership will affect the customer relationships in the sense that the relationships inevitably will become more long term. Also, customers need to shift from being buyers into being users. Retaining ownership will also have strong economic impacts. The level of tied up capital will increase quite a lot and due the performance sales there will be a certain amount of internalized costs. Data collection and data analysis are also deemed to be highly important in order for Scania to be able to deliver a high quality total solution.

One of the most noticeable barriers towards a switch of the business model is the fact that Scania is and has historically been performing very well, economically speaking. The last time Scania ended a year with red figures was in 1934. The circular business model also requires the customers to be willing to transform from being buyers into being users. Which during the study has proven to be an aspect of can be difficult to incur on. There are some internal barriers and risks as well but these could be targeted with a switch in how success and economic prosperity is considered. Also, a better understanding within the organization can remove much of the skepticism towards the concept and hence remove barriers as well.

**Keywords:** Circular economy, Circular business model, performance sales, Business model innovation, business model canvas, sustainable transports.

## **Acknowledgment**

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# Table of Contents

<b>1. Introduction</b> .....	<b>1</b>
1.1 Background .....	1
1.2 Purpose .....	2
1.3 Research question .....	2
1.4 Delimitations .....	2
1.5 Report Disposition.....	2
<b>2. Methodology</b> .....	<b>4</b>
2.1 Research Strategy .....	4
2.2 Research Design .....	4
2.3 Trustworthiness.....	10
2.4 Research Ethics.....	11
<b>3. Theoretical framework</b> .....	<b>14</b>
3.1 Sustainable transport solution.....	14
3.2 Circular Economy.....	16
3.3 The Business Model .....	20
3.5 Moving towards a Circular Business Model.....	27
<b>4. Empirical Study</b> .....	<b>30</b>
4.1 Scania's Current Business Model.....	30
4.2 Conceptualizing a Circular Business Model.....	35
<b>5. Analysis</b> .....	<b>47</b>
5.1 GAP-analysis .....	47
5.2 Capabilities and Competences development.....	50
5.3 Risks and Barriers .....	53
<b>6. Discussion</b> .....	<b>57</b>
<b>7. Conclusion</b> .....	<b>59</b>
7.1 Findings .....	59
7.2 Suggestions to Future Research.....	60
<b>8. Recommendations</b> .....	<b>61</b>
List of references.....	63
Appendix A .....	70
Appendix B .....	71
Appendix C .....	73
Appendix D.....	76
Appendix E .....	78
Appendix F .....	80

## List of Figures

Figure 2.1 Project Timeline .....	4
Figure 2.2 Research Design .....	5
Figure 2.3 Research Areas.....	6
Figure 2.4 Three part criteria .....	8
Figure 2.5 GAP-analysis.....	10
Figure 3.1 The approach of Linear Economy .....	16
Figure 3.2 The Circular Economy .....	17
Figure 3.3 Win-Win-Win of Circular Economy .....	19
Figure 3.4 Connecting Strategy and Business Model .....	21
Figure 3.5 Segments of the Business Model Canvas .....	22
Figure 3.6 Business Model Canvas .....	22
Figure 3.7 Connection between BMC and VPC .....	26
Figure 3.8 VPC - Customer Profile.....	26
Figure 3.9 VPC - Value Map.....	26
Figure 3.10 Product Service System.....	28
Figure 4.1 Current sales and distribution channels .....	31
Figure 4.2 Current communication set-up .....	31
Figure 4.3 Scania's Revenue Model .....	32
Figure 4.4 Feedback of knowledge about customer in the current BM.....	33
Figure 4.5 Overview picture of Scania's current BM .....	35
Figure 4.6 Proposed Product and Service offer to the CBM.....	39
Figure 4.7 Sales and distribution channels in the CBM .....	42
Figure 4.8 Communication set-up in the CBM.....	42
Figure 4.9 Feedback about customers in the CBM.....	44
Figure 4.10 Actors in the logistics value chain .....	45
Figure 4.11 Overview picture of the CBM.....	45
Figure 5.1 GAP-analysis.....	47
Figure 8.1 Implementation process for the CBM.....	62



## List of Tables

Table 2.1 Keywords for Literature Study .....	6
Table 2.2 Interviewees (Current BM).....	7
Table 2.3 Interviewees (CBM) .....	8
Table 2.4 Interviewees (External Customers) .....	9
Table 2.5 Workshop participants .....	9
Table 3.1 Indicators of Sustainable Transportation.....	15
Table 3.2 BMC - Type of customer segments .....	23
Table 3.3 BMC - Type of customer value .....	23
Table 3.4 BMC - Type of relationships .....	24
Table 3.5 BMC - Type of revenue streams .....	24
Table 3.6 BMC - Type of key resources.....	25
Table 3.7 BMC - Type of key activities .....	25
Table 3.8 BMC - Type of partnership .....	25
Table 4.1 External cases of Business Model Innovation .....	36
Table 4.2 VPH and Indicators of sustainable transportation .....	37

## List of Abbreviations

BM – Business Model

BMC – Business Model Canvas

BMI – Business Model Innovation

CBM – Circular Business Model

KPI – Key Performance Indicators

OEM – Original Equipment Manufacturer

PSO – Product and Service Offer

PSS – Product-Service System

R&D – Research and Development

ROI – Return of Investments

TCO – total cost of ownership

TM – Truck Manufacturer

VPC – Value Proposition Canvas

VPH – Value Proposition-Hypothesis

## SCANIA

**Connected Vehicles** – Connected vehicles means that the truck is capable of sending and receiving updates regarding the trucks performance.

**Scania Factory** – Scania Factory is a collective term referring to Scania’s research and development, production units and the central sales and marketing department, acting as one big unit.

**SAIL** – SAIL, Scania Access Information Line, is a portal aimed towards partners and employees at the Scania sales and services network.

# 1. Introduction

*This chapter will present a background to the thesis and also to why circular business models is a relevant research area. The purpose, delimitations, research questions and the report disposition will also be presented below.*

## 1.1 Background

The world will face major sustainability challenges in the future. By 2050, the global industrial system is targeted to double its output (Bocken et al., 2013) and in the same time period the world population is estimated to reach almost 9.2 billion people and the world GDP is estimated to grow from USD 77 trillion in 2012 to USD 305 trillion in 2050 (Beltramello et al., 2013). If the world continues on the current growth path and keep doing business as usual, humankind would by 2050 need the equivalent of three Earths in order to produce and absorb the waste of what is consumed (Bonciu, 2014). In other words, there are clear signs that with the shrinking availability of natural resources, deteriorating environmental conditions and changing climate, the growth path is far from sustainable (Beltramello et al., 2013).

The Brundtland Commission stated in 1987 that sustainable development is *“Development that meets the need of the present without compromising the ability of future generations to meet their own needs”* (World Commission on Environment and Development, 1987, pp 16). Unfortunately, the prevailing system of global economy has since the industrial revolution more or less followed a linear approach, relying on an endless supply of resources. This linear consumption along with a senseless *“take, make and dispose”* mentality has led to a consumption-pattern that highly jeopardize the ability of future generations to meet their needs (Ellen MacArthur Foundation, 2013a). Fortunately, many companies have in recent years expressed an active strive to turn to more sustainable solutions. The challenges in turning to a more sustainable approach are a global problem that implies a need for economic, social and environmental changes (Bocken et al. 2013).

The continuously rampant consumption has affected the resource-prices and recent price climbs (Dobbs et al., 2011; Ecorys, 2011) has presented companies with reasons to question the current linear economy being the divine and almighty way in which to run businesses (Nguyen et al., 2014; Lacy et al., 2014; Bonciu, 2014). According to Dobbs et al. (2011), commodity prices are now at levels unseen since the beginning of the 20<sup>th</sup> century. The circular economy is a concept within sustainability that in recent time has gained increased amounts of interest from both the industry and academia. Circular Economy is centered on effective resource utilization that maximizes the value extracted from the resources. Resources are kept in the value chain over a longer period of time, and through a number of returning loops resources are enabled to be utilized again and again. The possible benefits related to Circular Economy span across all of society, and hence is an appealing concept for many actors in society. However, a real change is only possible if there are real incentives for companies and customers to turn towards a more circular business model (CBM). This in turn will require enterprises to redefine strategies and business models (BM) (Stahel, 1998).

In theory the circular economy have the ability of being beneficial to all actors of the society. However, in order for circular economy to achieve a significant breakthrough it has to be incorporate as natural part of companies' way of making business. Therefore, it is of interest to conduct research within the field of creating business models that embraces principles from circular economy. This study aims to investigate how truck manufacturers could embrace a circular business model.

Scania has a pronounced aim to be the leader in sustainable transport and to create value to their customers by delivering customized solutions with focus in efficiency (Scania AB, 2015a). There is a clear ambition of being in the forefront in reinventing the way of making business. Preparing for a transition to a circular model is one of many steps in that direction.

## 1.2 Purpose

The purpose of this master thesis is to examine internal changes that are required when a global truck manufacturer, such as Scania, would like to embrace a circular business model in order to provide their customers with sustainable transports solutions.

## 1.3 Research question

In order to fulfill the purpose of examining internal changes that are required if Scania would like to embrace a CBM, firstly a CBM will be defined. The CBM will represent the target scenario for Scania. Defining what is required of Scania in a CBM requires identifying how the CBM is different from the current. The purpose along with the above mentioned arguments have broken down into four research questions:

**RQ1** - How does Scania's current business model look like on a general level?

**RQ2** - How could a performance-based circular business model look like at Scania?

**RQ3** - What are the main differences between the current and the circular business model, translated into capabilities and competences?

**RQ4** – What risks and barriers are there that hinder a switch to a circular business model?

## 1.4 Delimitations

In the initial step of the thesis, the researches consulted the supervisor at both Scania and Chalmers in order to establish delimitations to the study. The delimitations are listed below.

- The BM description conducted in the thesis will be kept on a general level in order to fit a broader mass of business areas, i.e. the detail level has deliberately been kept on a lower level than sometimes possible
- The thesis will be delimited from investigating how recycling, refurbishment and remanufacturing can be incorporated in the CBM and solely focus on the performance sales.
- Interviews will solely be conducted with actors on the Swedish market
- The thesis will solely focus on Scania's business segment connected to trucks and not include any aspects of the bus-segment or industrial engines-segment

## 1.5 Report Disposition

In this section the disposition of the thesis will be presented chapter by chapter to make it easier for the reader to see how the report come together. This section also aims to make it easier for the reader to find relevant information.

### 1. Introduction

The introduction chapter will present the background to the research and introduce the reader to how the research has been defined. It will also present the thesis purpose, research questions and delimitations.

### 2. Methodology

The second chapter will present the chosen research design and describe how the research was conducted. It also contains sections regarding trustworthiness and research ethics.

### 3. Theoretical framework

The third chapter will introduce the reader to the theoretical framework that has been used in the study. More specifically the reader will be introduced to theory regarding sustainable transport solutions circular economy and BMs.

### 4. Empirical Study

The fourth chapter will present the empirical data that have been gathered throughout the study. Also, this chapter will present the current BM, answer to RQ1, and the CBM, answer to RQ2.

**5. Analysis**

The fifth chapter will present the analysis of the empirical data. A GAP-analysis is conducted to show the differences between the current BM and the CBM. The chapter will also present answers to RQ3 and RQ4.

**6. Discussion**

The sixth chapter will present a discussion regarding the thesis as well as the trustworthiness and transferability of the study and its findings.

**7. Conclusion**

The seventh chapter will present the concluding findings of the thesis. It will also give suggestions to future research.

**8. Recommendation**

The eighth and final chapter will present recommendations that are given to Scania.

## 2. Methodology

*This chapter of the report will describe the scientific considerations that have been made by the researchers. The chosen research strategy and research design is also presented. Furthermore, this chapter elaborates upon the quality and ethical aspects of this study.*

### 2.1 Research Strategy

The master thesis project was carried out at the *Research Support Office* at Scania's Research and Development department in Södertälje, Sweden. The report describe some internal capabilities and competences lacking today as well as some barriers that the company may face if the present business model (BM) should be transformed into a circular business model (CBM). The study is qualitative and will hence be concerned with words in preference of numbers (Bryman & Bell, 2007). Being a qualitative study, it is most natural to take an inductive approach in regards to theory. However, as is the case with much research, there are some deductive elements included in this thesis. (Bryman & Bell, 2007).

### 2.2 Research Design

The research was conducted during 20 weeks and followed the design of figure 2.1. The researchers were located at Scania, Södertälje. During the study, the researchers worked on the report in parallel to conducting the research. Additionally, at the end of the 20 weeks the researchers dedicated 2-3 weeks to writing up the results and preparing the presentations.

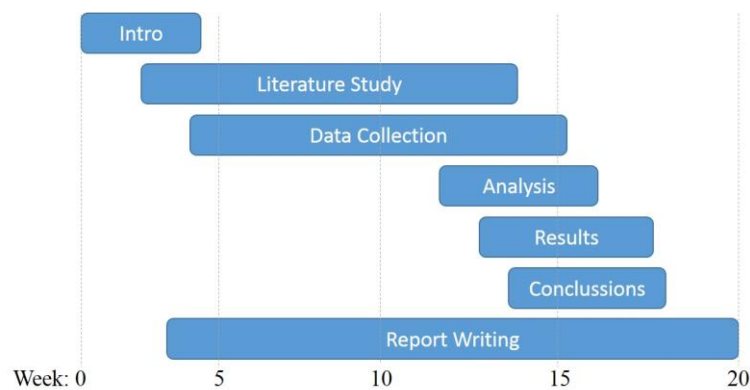


Figure 2.1 Project Timeline

The research project was initialized by Scania's Research and Support Office and was conceptualized by the researchers. In the initial phase of the research project, the researchers focused on defining the problem and planning the research. The purpose and research questions were outlined in this phase, which aided the researchers in finding a suitable research strategy and to make a plan for research design and execution.

The following phase of the research consisted of a literature study, where the initial purpose was to broaden the researchers knowledge about sustainable transportation, circular economy and BMs. As soon as the researchers had acquired a general understanding within the above-mentioned areas, focus was turned towards addressing the research questions.

In parallel to most part of the literature study, empirical data were collected. Data were mostly collected through interviews, meetings and workshops with employees at Scania as well as external customers to Scania (hauliers). Inspiration to the creation of the BMs was also sought through external examples of BM that have been innovated towards performance sales and studies of internal business areas. By conducting the literature study in parallel to the empirical data collection, the researchers were guided in further data collection in an iterative process.

The data collection led to the mapping of two BMs. The two models were mapped in parallel in order to be time-efficient. Scania's current BM was mapped as a merger of the many different business areas within Scania and was kept on a general level in order to consider all the different business areas. As described in section 1.4 *Delimitations* the business model will not be described with the most level of detail in order for it to be applicable for many business areas within Scania Trucks. The CBM is based on inspiration from already existing CBM, internal and external interviews and also a workshop.

The BMs were compared in a GAP-analysis that revealed the differences. Based on these differences, capabilities and competences lacking at Scania in order to implement and operate according to the CBM were identified. Barriers towards implementing and operating the CBM were also identified. Both external and internal barriers were identified and described. The research design is illustrated in figure 2.2.

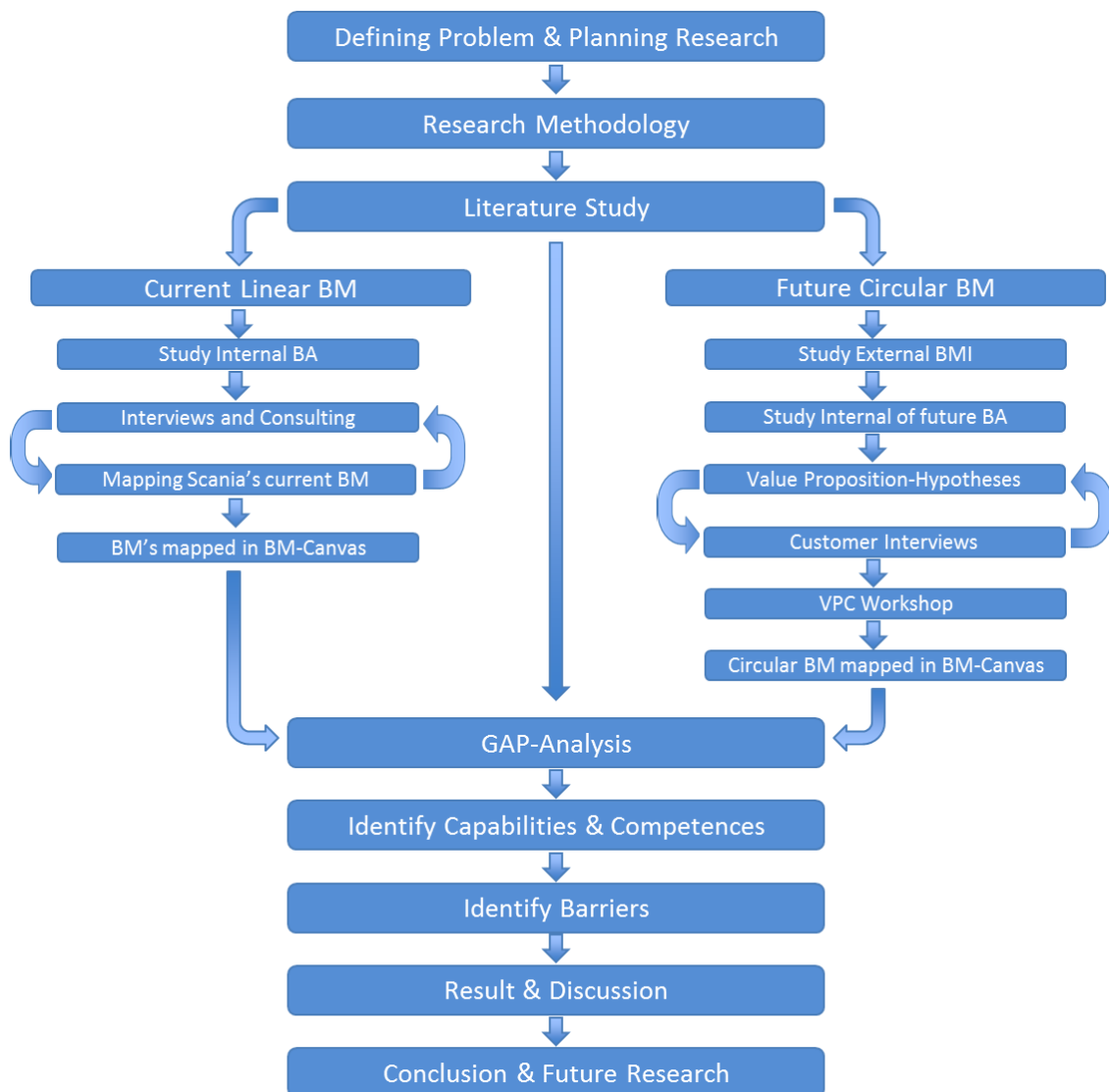


Figure 2.2 Research Design

### 2.2.1 Literature study

In the initial phase of the thesis the researchers discovered that the literature addressing the concept of CBMs, connecting the principles of circular economy to BMs, was not extensively researched. The initial guidelines in the thesis were to a large extent based on the reports published by the Ellen MacArthur Foundation. These reports create a coherent and comprehensible description of circular economy. Also, the reports are frequently referred to in the literature regarding circular economy.

The researchers soon discovered that most of the literature that revolves around circular economy focuses on enhancing recycling, reuse, refurbishment or remanufacturing, instead of embracing the utilization phase and how products and services should be utilized in a sustainable way. In order to get a broader view of the theory around CBMs the literature study was based on three different research areas that together capture the concept of CBMs. The research areas were identified from the initial terms of references that were provided to the researchers by Scania. The identified research areas were; Sustainable Transports, Circular Economy and Business Model as illustrated in figure 2.3. All three of the research areas connect to CBMs from different perspectives and are further elaborated in chapter 3, *Theoretical Framework*.

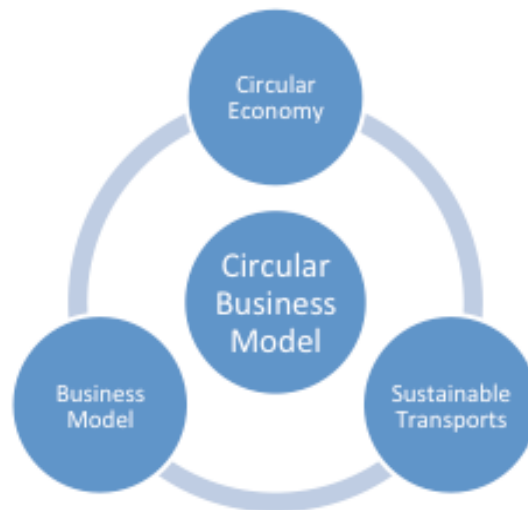


Figure 2.3 Research Areas

The main source used for literature search was Internet databases. The databases used in the thesis were Chalmers library database, Google Scholar, Science Direct and Emerald. The keywords that were used in the search for literature are compiled in table 2.1. To find as relevant literature as possible the keywords were used both as detached search terms and in many different combinations.

#### Keywords in literature search

Sustainable transports, cradle-2-cradle, business model, business model innovation, circular economy, performance sale, product-service system, business model canvas, value proposition canvas, value creation

Table 2.1 Keywords for Literature Study

In addition to the literature collected from databases, books and articles were collected from Chalmers Library, KTH Library and Södertälje City Library. The literature found from searching in databases was also complemented by articles and papers recommended by Scania, the supervisor at Chalmers and researchers from Chalmers.



### 2.2.2 Empirical data collection

The empirical data collection in this thesis was divided into two parallel processes, see figure 2.2. One process where data was collected in order to map Scania's current BM and one where data was collected in order to create a CBM. Common to both of these processes is that the collected data was consolidated and mapped into a BM template called Business Model Canvas (BMC), see section 3.4.1 *Business Model Canvas*.

#### **Current Business Model**

The empirical data collected to enable the mapping of Scania's current BM was mainly gathered from interviews that were continuously conducted throughout the thesis. The interviews were organized in a semi-structured way, where open questions were asked and followed up by more specific questions that emerged during the interview. The reason for using semi-structured interviews is that the interviewees are given the chances to present more comprehensive answers (DiCicco-Bloom & Crabtree, 2006). A list of interviewees with their position and affiliation is presented in table 2.2. The template used during these interviews can be found in Appendix A.

Position	Affiliation
Managing Director	Scania Transportlaboratorium AB
Business Analyst	Scania CV AB (Research and Development)
Director	Scania CV AB (Sales and Marketing)
Sales Director	Scania CV AB (Sales and Marketing)
Product Manager	Scania CV AB (Sales and Marketing)

Table 2.2 Interviewees (Current BM)

In addition to the interviews, internal business areas were studied. The internal business areas were studied through the use of qualitative interviews where the interviewees were asked to fill in a predefined BM template, see section 3.4.1 *Business Model Canvas*. Studying internal business areas gave the researchers opportunity to combine different qualitative methods and gain knowledge in the specific areas, similar to the benefits connected to proper case studies (Bryman & Bell, 2007). The mapping of current BM was kept on a general level due to the differences between the business areas within Scania. Some of the business areas within Scania had already started a transition towards a more service-based offering. However, the business areas all derive from a product-centric standpoint and have many common denominators. It is the common denominators that the mapping of the current BM is based on. The current BM was verified with Scania-employees in order to ensure the validity.

#### **Conceptualizing a Circular Business Model**

The process of conceptualizing a CBM was divided into two stages. The first stage consisted of defining the value that the BM intends to deliver and how that value should be delivered. In the second stage of the process, focus was turned into mapping what a CBM would require from Scania.

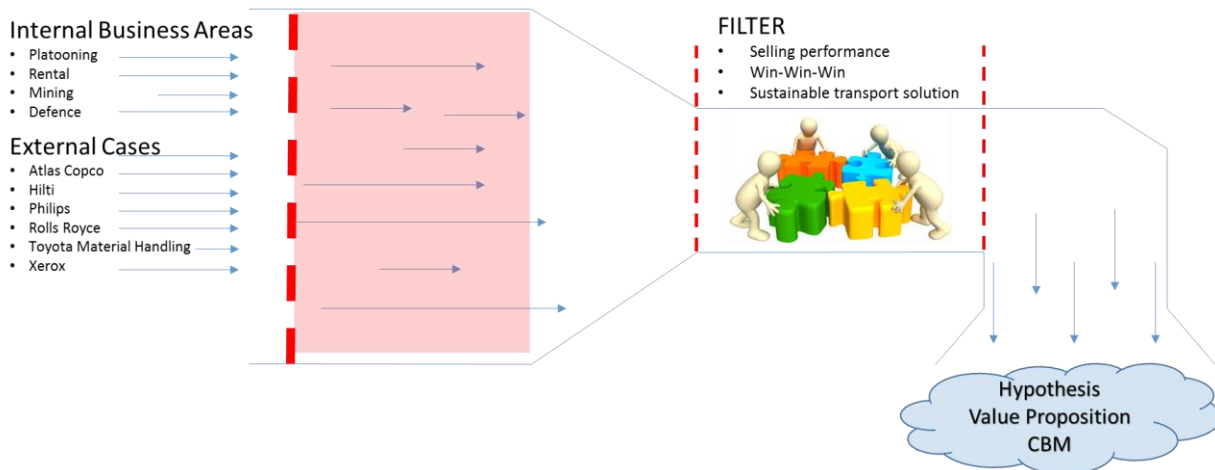
As an initial step in collecting empirical data to the CBM, a number of companies that have innovated their BM and moved towards a CBM were studied. A list of studied companies is presented in table 4.1. The companies that were chosen to be studied were in the literature emphasized as BMs in which some of the principles of circular economy had been embraced. The choice to study already established CBMs is based on the article by Martins et al. (2015). In the article two frameworks are presented that both advocate the finding of a source concept or modifier concept that in comparison with the current BM will present similarities or differences. Finding these similarities or differences allows the construction of a new BM to be based on already tested ideas. Also giving the researchers a way in which to avoid reinventing the wheel. The source concepts or modifier concepts were in this study represented by the already successful CBMs applied by different companies. The findings from these BMs were merged together and gave a good understanding of what the important elements of the CBM will be.

The studies of companies were complemented by semi-structured interviews with employees at Scania that in some way worked with business development or development of future business areas. A list of interviews with their position and affiliation is presented in table 2.3.

Position	Affiliation
<b>Team Manager within Truck, Cab and Buss Chassis</b>	Scania CV AB (Research and Development)
<b>Team Manager within Powertrain Development</b>	Scania CV AB (Research and Development)
<b>Senior Engineer within Powertrain Development</b>	Scania CV AB (Research and Development)
<b>Product Manager</b>	Scania CV AB (Sales and Marketing)
<b>Business Analyst</b>	Scania CV AB (Research and Development)
<b>Director</b>	Scania CV AB (Sales and Marketing)

**Table 2.3 Interviewees (CBM)**

The findings from the above mentioned data collections were used as foundation in formulating a value proposition-hypothesis (VPH) to a future CBM. To ensure that the established BM would direct Scania towards selling sustainable transport solutions, a three part criteria was constructed, see figure 2.4. The three part criteria consisted of one part focusing on sustainability, one part focusing on selling performance and the last part aimed to create a win-win-win situation.



**Figure 2.4 Three part criteria**

To quantify progress in terms of sustainability, and to ensure progress in the sustainability criteria, a number of indicators were used. Each indicator was given a direction in which they should make progress in order to be considered as contributors to a sustainable transport solution, see section 3.1.2 *Indicators to Sustainable transport solution*.

The criteria of selling performance was set up since selling performance is according to Stahel (1998), considered as a step in becoming more sustainable and also moving towards being an actor in a circular economy. The basic principle of this criteria was to ensure that the BM was innovated from a BM based on selling products into a BM that focuses on selling performance.

The third criteria, win-win-win, were set up to ensure that the future BM focuses on creating a holistic win-situation including company-, customer- and societal-win. Hence, the VPH has to be capable of actualizing a situation that could be considered as win-win-win.

**Interviews**

When the established VPH had passed through the three part criteria it was considered as a value proposition that would be justified in a CBM. To ensure a market fit and credibility, the VPH was iteratively tested in semi-structured interviews, where actors within the transport industry were interviewed, see table 2.4. The interviews were carried out in accordance to an interview guide that

were created by the researchers. The interview guide is presented in Appendix B. After consultation with the supervisor at Scania, the researchers chose to interview actors within the customer segments of Long Haulage and Distribution. The customer segments were chosen because of their size in terms of produced volumes. Also, by choosing two different segments the researchers aimed to include the environmental aspect of different customer requirements.

Position	Affiliation	# trucks
<b>Managing Director</b>	Mid-size haulier	33
<b>Traffic Manager</b>	Mid-size haulier	35
<b>CEO</b>	Large-size haulier	485
<b>CEO</b>	Mid-size distributor	13
<b>CEO</b>	Large-size distributor	135
<b>CEO</b>	Large-size distributor	75

**Table 2.4 Interviewees (External Customers)**

The template used during the interviews is presented in Appendix C and was set up according to the principles of the Value Proposition Canvas (VPC), see section 3.4.2 *Value Proposition Canvas*. As a step in determining how the BM should deliver value, the interviewees were asked to give feedback to the VPH in terms of what products and services that should be included. Besides the main objective of testing the market fit of the value proposition, the interviews were also aimed at collect data that were used as input in generating a customer profile of a future actor within the transport industry. In total, two customer profiles were constructed, one representing the customer segment Distribution and one representing Long Haulage. Additionally, the customer interviews gave the researchers an indication of whether or not the market is ready and prepared to accept the proposed value proposition. The interviews will also reveal potential barriers to why the customers may be hesitant to switch to a total solution as opposed to buying the truck as a product.

### **Workshop**

In the second stage of conceptualizing a CBM, the aim was to map how the BM creates value. To bring clarity and understanding of what a CBM actually is, the researchers initiated the second stage by conducting a VPC-workshop with the aim of suggesting a product and service offer (PSO) to the CBM. The VPC-workshop was conducted with employees from different business areas within Scania, see table 2.5. The workshop proceeded according to the workshop-guide that was created by the researches and presented in Appendix D. During the workshop, the researchers acted as facilitators and the participants were asked to suggest a PSO that could fulfill the requirements of the two pre-defined customer profiles. Each customer profile consisted of a job-description, what is considered core business and aspects considered as Pains or Gains in their operations. The customer profiles are more thoroughly described in Appendix E. In addition to the customer requirements, the participants were also provided with a future transport industry scenario that they were obliged to relate to. The workshop resulted in a PSO that was used as foundation in mapping the CBM into a business model canvas (BMC).

Position	Affiliation
<b>Business Analyst</b>	Scania CV AB (Research and Development)
<b>Product Manager</b>	Scania CV AB (Sales and Marketing)
<b>Senior Manager</b>	Scania CV AB (Research and Development)
<b>Team Manager within Scania Mining</b>	Scania CV AB (Sales and Marketing)
<b>Managing Director</b>	Scania Transportlaboratorium AB

**Table 2.5 Workshop participants**

### 2.2.3 Analysis

The analysis was centered on a GAP-analysis. A GAP-analysis is an identification and analysis of the differences between a future desired state and the current state (Cambridge Dictionaries Online, 2015). The GAP-analysis will reveal if there is a gap between the current and the future state, and also the factors responsible for this gap, see figure 2.5. In this thesis, Scania's current BM depicts the current state and the future state is depicted by the CBM. The two BMs, the current and the CBM, were compared by matching each block of the BMCs with the correlating block in the opposite BM. The key resources of the current BM were compared to the key resources of the CBM and so on. The differences were mapped and the direct consequences of these differences were also described.



Figure 2.5 GAP-analysis

The differences were grouped into general categories. These categories were used as base when listing capabilities and competences considered as necessary if Scania were to embrace a CBM. The differences along with the capabilities and consequences were connected to the possible barriers possibly associated with an implementation of the CBM. Both external and internal barriers were described.

## 2.3 Trustworthiness

The collected data was retrieved through a combination of literature studies, interviews and a workshop. The focus has been empathized on collecting qualitative data. Bryman & Bell (2007) discuss problems related to qualitative research, which are related to how to ensure reliability and validity in qualitative research. Mainly, the problem is how to ensure subjectivity, i.e. that research can be generally applicable. Furthermore, as discussed by Kapoulas & Mitic (2012), when conducting qualitative research it can be difficult to explicitly portray all available data, i.e. the researchers has an personal interpretation of the collected data. Bryman & Bell (2007) presents four different factors that affect trustworthiness of qualitative research; *credibility*, *transferability*, *dependability* and *confirmability*.

### 2.3.1 Credibility

Credibility of a research relate to the fact that the findings presented in the research in a correct way reflects statements made by participants and that the research has been conducted according to research standards (Bryman & Bell, 2007). In the thesis, the researchers took some actions to ensure credibility. Both researchers were present during all interviews and transcriptions were made after each interview. This enabled the researchers to afterwards discuss their interpretations of the interviews. In cases of any uncertainties among the researchers the interviewees were addressed through further

interviews, emails or phone calls. Triangulation was used as method to assure systematic checks of the research findings (Kapoulas & Mitic, 2012). Findings were validated by interviewing several employees from different departments about the same subject and by having the same research questions when interviewing external customers. The research findings were also continuously discussed with employees at the Research Support Office at Scania and supervisor at Chalmers University of Technology.

### **2.3.2 Transferability**

Findings of qualitative research typically entail depth rather than breadth (Bryman & Bell, 2007). Transferability aims to describe how well the research findings are applicable to some other context. Since the findings in this thesis are based on a case study at Scania, the transferability to other contexts could be questionable. However, the concept of BMs that enables sustainable transport solutions are relevant for the whole future truck industry and not specific to Scania. Furthermore, the external customers that have been interviewed during the thesis are not exclusively Scania customers and they have explicitly been asked during the interviews to focus on the overall truck industry and not on a specific truck brand.

It is the researchers intention that the research findings should be transferable within the Swedish urban distribution and long haulage industry. To increase the transferability of the findings in this thesis the reader is provided with a description of the environmental preconditions in which this case has been studied. The findings are also to the highest possible degree related to generally accepted theory within the field, which increases the transferability (Bryman & Bell, 2007). Both these activities has been conducted to help the readers of this report to evaluate the transferability. In addition, the fact that both company internal and external interviews have been conducted increases the transferability of the research findings.

### **2.3.3 Dependability**

The aim of dependability is to reflect how consistent and well the findings of the research can be replicated at another time. Qualitative research has because of its natural subjectivity an inherent limitation in its dependability (Bryman & Bell, 2007). In this study, both researchers and participants have most likely affected the findings and changing any of them could make an impact. The researchers have actively worked to increase the dependability of the study. The research process has been thoroughly documented, together with findings from the workshop and transcriptions from interviews.

### **2.3.4 Confirmability**

Confirmability aims to ensure that the researchers have acted in good faith, i.e. that the subjectivity of the researchers has not affected the findings of the study (Bryman & Bell, 2007). To decrease the impact of subjectivity, both researches have been present in all steps of the thesis and transcriptions or summaries of all interviews have been made. To avoid a one-person perspective, both researchers have also been part of developing the research method and conducting the analysis. The fact that the researchers have been aware of the potential implications of subjectivity in a qualitative research, have made the researchers to actively make precautions to be as objective as possible throughout the entire research project.

## **2.4 Research Ethics**

The following section presents the ethical principles that have been taken into account by the researchers during the thesis. The ethical principles are those suggested by Dainer and Crandall (1978), namely *harm to participants*, *lack of informed consent*, *invasion of privacy* and *deception*.

### **2.4.1 Harm to Participants**

Harm to participants can entail number different aspects, such as; physical harm, harm to participants' development of self-esteem, stress or harm to participants' prospects or future employment (Bryman & Bell, 2007). The participants in this study have not been exposed to any elements risking their physical harm, hence the main concern for the researches has been to avoid any kind of psychological harm or harm to participants' prospects or future employment. The elements that could be considered potential sources to psychological harm to participants in this thesis are the interviews. According to Bryman & Bell (2007), interviews can induce stress and probing questions can affect the interviewee and make them feel uneasy. Since stress is a subjective issue, it is difficult prior to an interview to know whether an interview question or the interview set up might induce stress among the interviewees. Therefore it is hard to create an interview set up and interview questions that are guaranteed not to cause any stress among the participants. However, all that has participated in this study have been informed about the topic for the interview in advance and they have all participated by their own free will. During the interview participants were also informed that they were not forced to answer all questions. If a question caused any feelings of unease the participants were free to skip answering that question.

Prior to all interviews the interviewees were informed that their participation would be kept anonymous and that no information would be able to be traceable back to them personally. This was made as a precaution in order to avoid any harm to participants' career prospects or future employment. During the initial phase of every interview the participant were given the option to approve if the interview was audio recorded or not. All recorded data, together with personal names and company names of hauliers were handled confidential to everybody except the researchers.

In addition, before the thesis was started a confidentiality agreement was signed between Scania and the researchers. The agreement was signed to ensure that no confidential information obtained at Scania is included in the report or spread outside the company. Before its publication at Chalmers University of Technology, the supervisor at Scania reviewed the report.

### **2.4.2 Lack of Informed Consent**

Throughout the study, the researchers have been consistent about keeping the purpose and the research process open to all participants. All first-time interviews and meetings with the participants were initiated with an introductory presentation of the thesis, the research process and the research questions aimed to answer. Because of the fact that each individual requires different amount of information to create an informed consent (Bryman & Bell, 2007), the participants were given time to ask the researchers question, enabling them to make informed decisions of consent. Before any questions were asked to the participants, an oral consent was given from them, allowing the researchers to use the data collected from the interviews.

### **2.4.3 Invasion of Privacy**

All participants in this study have in advance to conducted interviews been informed about the purpose of the interview and what it will entail. Since the subject of privacy is subjective by nature, it is recommended that the researchers treat each case sensitively and individual, giving the participant an genuine opportunity to withdraw (Bryman & Bell, 2007). In this thesis, participants have in all situations been given the option to not answer a question or to stop an interview if they have considered any question too personal or that it have invaded in their privacy. However, the opportunities to withdraw or refuse to answer were not used by any of the participants. Therefore, the researchers have no intention to believe that the privacy of any participant has been exploited to any acts of invasion.

#### **2.4.4 Deception**

Deception occurs when research is presented as something other than what it is. According to Bryman & Bell (2007), is deception quite widely spread in much research and often used to as part of research to limit participants understanding so that their respond more naturally. Prior to all interviews the researchers has been upfront with the purpose of the study as well as carefully presented the purpose of the interview to all participants. Therefore, it is the researchers intention to deem that no deception or suppression has been necessary in order to get the information that was search for.

### 3. Theoretical framework

*This chapter will present the theoretical background that has been used in the study. The concept of circular economy and the concept of business models (BM) are introduced and defined. Also, the frameworks used in the study are presented.*

#### 3.1 Sustainable transport solution

In recent time, legislators both on national and international levels have presented heavier demands on vehicle emission levels and the sustainability of transports. This has led to a growing number of initiatives within the area indicating that the industry is taking conscious steps towards more sustainable transportation (Mihyeon Jeon & Amekudzi, 2005).

The European Union together with the European Commission has since the 1980's used framework programs (FP) to enhance research and technological development within the European Research Area. The current program, which is the seventh FP, is called Horizon 2020 and was stipulated in 2014. Horizon 2020 aims to emphasis excellent science, industrial leadership and tackling societal challenges (Horizon 2020, 2015). Within the program, 7,7 billion Euro is assigned to transport research with the aim of develop smarter, greener and integrated transports (European Comission, 2011). Transport research under Horizon 2020 has been divided into four main priorities:

- Resource efficient transport that respects the environment
- Better mobility, less congestion, more safety and security
- Global leadership for the European transport industry
- Socio-economic research and forward looking activities for policy making

One of the many companies that work according to the goals of Horizon 2020, and that take action to provide more sustainable transportation is Scania (Scania AB, 2015b). With support from legislations and customer cooperation, the company aims to reduce the carbon dioxide emission by 50 % by 2020. In order to reach the goal, Scania intends to target four areas; smarter logistics, improved driver skills, vehicle development and biofuels (Scania AB, 2015b).

##### 3.1.1 Defining Sustainable transportation

The definition of Sustainable transportation made by the Transportation Research Board is *"... sustainability is not about threat analysis; sustainability is about systems analysis. Specifically, it is about how environmental, economic, and social systems interact to their mutual advantage or disadvantage at various space-based scales of operation."* (Litman & Burwell, 2006, p.333). This definition contains three dimensions that are recurring in a majority of the definitions of sustainable transportation: the progress in economic development, environmental preservation and social development (Mihyeon Jeon & Amekudzi, 2005; Kolak et al., 2011).

Economic development refers to the prosperity of the commercial aspects such as productivity, business activity and trade. The environmental aspect concerns for example emission levels, climate change and biodiversity. The third dimension, the social development, concerns the wellbeing of the human community, e.g. human health, community livability and cultural values (Litman & Burwell, 2006).

##### 3.1.2 Indicators to Sustainable transportation

The dimensions of sustainable transportation: economic development, environmental aspects and social developments are on a level that is difficult to quantify, which in turn makes them difficult to concretize. In order to concretize the three dimensions, indicators have been articulated. In the literature, indicators for a sustainable transport system are presented, which includes aspects of all transportation, both passenger and freight transportation (Dom & de Ridder, 2002; Mihyeon Jeon & Amekudzi ,2005). Since this thesis focus on the transportations related to the truck industry not all indicators that are



listed in the reports are applicable to the thesis. Indicators relating to the trucking industry were sourced from two articles and only the indicators the researchers believe concern the trucking industry have been compiled. Therefore, a selection of indicators related to trucking industry are compiled and presented in table 3.1. The indicators will help the researchers judge whether or not a proposed value proposition hypothesis (VPH) will contribute in delivering a sustainable transport solution. Also, it will give the readers an idea of how the VPH is considered in terms of sustainability. The articles from which the below-listed indicators have been sourced are *“Indicators to Assess Sustainability of Transport Activities”*, an article written for the European Commission, and *“Addressing Sustainability in Transportation Systems: Definitions, Indicators, and Metrics.”*, an article printed in the Journal of Infrastructure Systems.

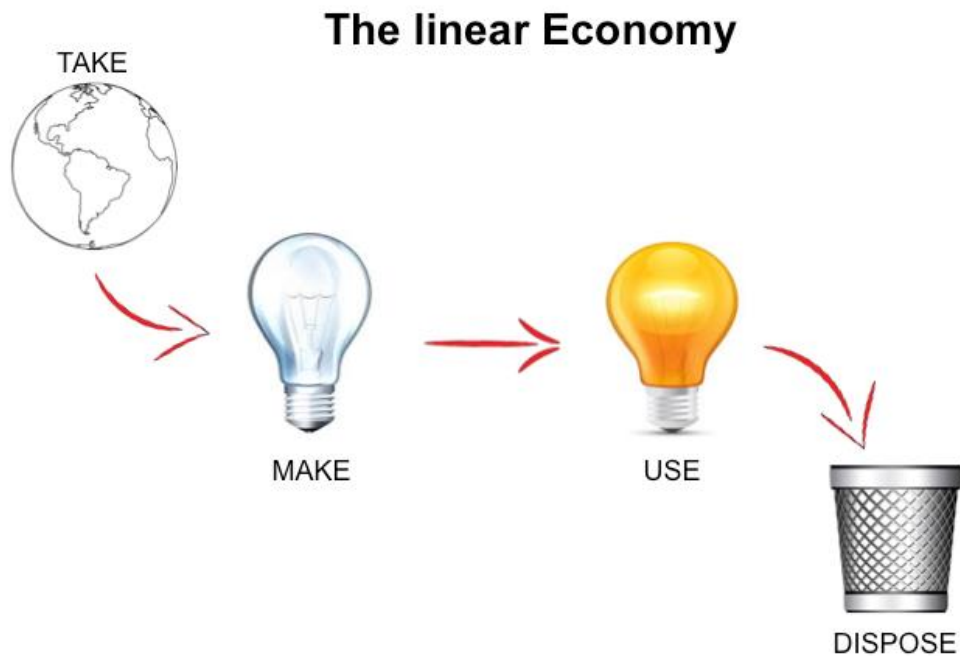
Dimension	Indicator	Direction
<b>Economic</b>		
	Economic efficiency	More is better
	Load factors for freight transport	More is better
	Vehicle fleet composition	Balanced is better
	Capacity of transport infrastructure	More is better
<b>Social</b>		
	Road Utilization Index	Balanced is better
	Emissions rates per tonne-km	Less is better
<b>Environment</b>		
	Load factors for freight transport	More is better
	Vehicle fleet composition	Balanced is better
	Emissions rates per tonne-km	Less is better
	Fossil fuel consumption	Less is better
	Overall energy efficiency	More is better

**Table 3.1 Indicators of Sustainable Transportation.**

Source: Dom & de Ridder (2002); Mihyeon Jeon & Amekudzi (2005)

### 3.2 Circular Economy

The move during the early 20<sup>th</sup> century from craft production to mass production led by the American automotive industry set the standard for how industries operate today. The basic principle in industrial economy has since been a one-way, linear-approach, see figure 3.1. Raw materials are extracted from the environment, turned into products and eventually disposed as waste (Stahel, 1998; Braungart et al., 2007).



**Figure 3.1 The approach of Linear Economy**

In search of greater profit, companies have focused on increasing the sales volumes and also to increase efficiency in production processes as well as seeking economies of scale where possible (Stahel, 1998; Preston, 2012). This increased volume, i.e. growth, requires in many cases an increase in the material used. Hence, economic growth has consistently been and is to a large extent still coupled with an increased resource usage (Lacy et al., 2014). For long, there have not existed any economic incentives for companies to rethink this BM. However, a turbulent resource market with increasing prices and increased volatility has now presented serious incentives for companies to assess the validity of current BMs (Nguyen et al., 2014). Resources will in the future become increasingly scarce and prices are predicted to rise and hence undermining the idea of unlimited resources present in the linear economy (Lacy et al., 2014). Circular Economy is seen as a concept that will enhance sustainability across society without limiting economic development (Ellen MacArthur Foundation, 2013a).

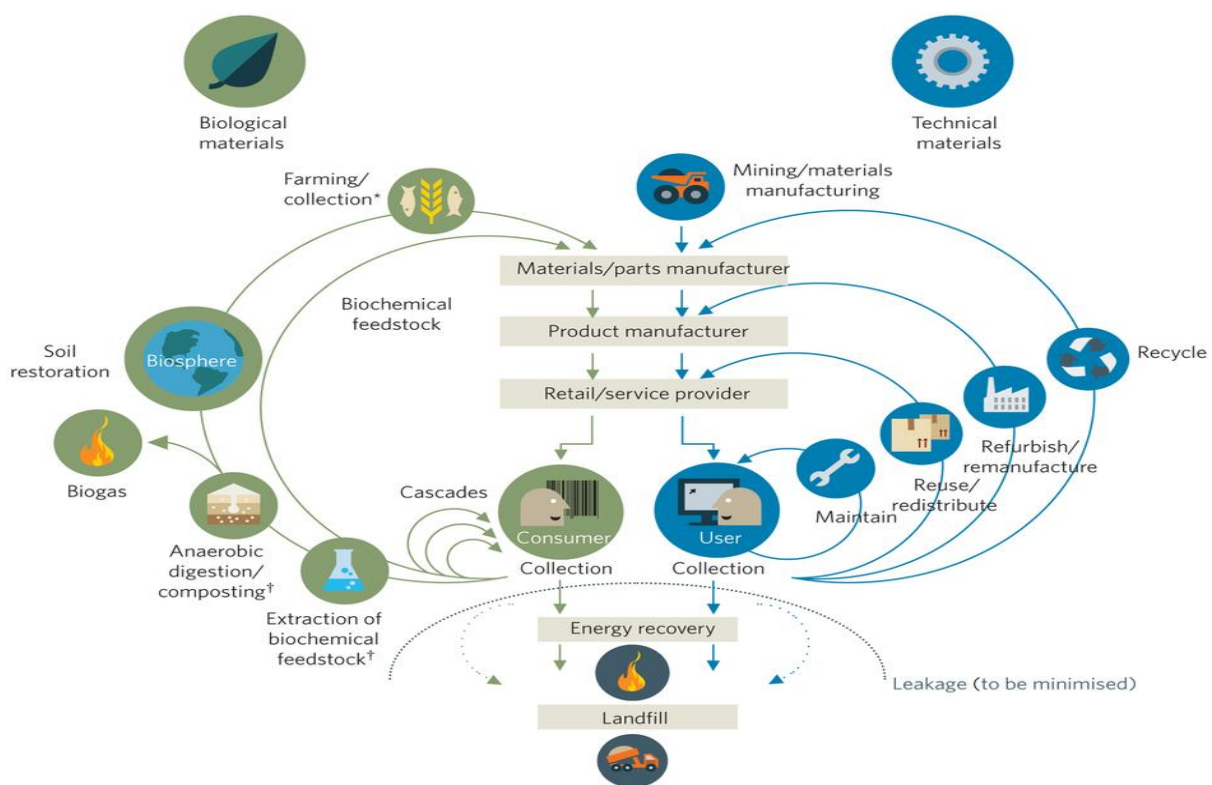
#### 3.2.1 Defining Circular Economy

Opposed to the “take-make-use-dispose” approach of the linear economy the circular economy is centered around regeneration and restoration (Nguyen et al., 2014; Ellen MacArthur Foundation, 2013a). A well-functioning Circular economy involves both suppliers and customers, and connects all operators in a vast supply chain network. This holistic scenario is however not easily reached and requires substantial changes in governmental policies as well as the strategies and BMs of companies (McDonough & Baumgart, 2002). Circular Economy is focused on economic value creation and as a positive inevitable consequence it improves ecological aspects (Philips, 2015).

### 3.2.2 Activities in circular economy

There are a number of similar descriptions of the circular economy presented in the literature and they all comprise loops in order to visualize the material flow. As described by McDonough & Baumgart (2002), the Economical system should find inspiration in the circularity present in some of nature's eco systems. For example, the photosynthesis, in which material is able to maintain their status as resources and being upcycled over time.

In order to present the main activities in a circular economy, the description presented by Ellen MacArthur Foundation will be utilized in this thesis. As illustrated by figure 3.2, the material flow is non-linear and there are a number of returning loops present in order to reintroduce material into the value-chain and hence improve resource utilization. The concept of circular economy is holistic and comprises all activities within a Society (Ellen MacArthur Foundation, 2013a; Bonciu, 2014). This demands, as mentioned above, substantial changes in how businesses and society operates. These changes that companies must undertake are tightly linked to the loops visualized in figure 3.2.



**Figure 3.2 The Circular Economy**

Source: van Renssen (2013)

The right hand side of figure 3.2 concerns technical materials and is therefore the most suitable for this thesis. Below, each loop of the technical material flow will be described.

The outer-most loop, Recycle, is to some extent already established today but in a manner that is a complement to the linear economy. However, it is still an important step towards a more circular economy. Recycling is the process of recovering materials in order for it to be reintroduced into the material flow. Recycled material is often returned to the start of the material flow, e.g. as raw material. The material can be reintroduced at the same quality level or downgraded or upgraded to different levels of quality (Ellen MacArthur Foundation, 2013a). There are however, according to some authors, limitations to the extent to which recycling is profitable and actually reduces the resource utilization. According to (Stahel, 1998), recycling does not reduce the flow of material but it has the potential of decreasing the waste and depletion of resources globally. Also, as stated by Mckinsey (2015a) recycling

only targets the value bound to the price of the raw material. The value created by labor and energy is still lost.

Refurbishment and remanufacturing are additional activities within the circular economy that enables a better exploitation of resources. Also, it can create a win-win situation for the producer and the customer since less cost is needed to complete the product and consequently the products may be significantly less expensive to purchase for the customer (Gutowski et al., 2011; Stahel, 1998). Remanufacturing and refurbishment aims to create an as-good-as-new product from an already used product. By doing this the life span of certain products can increase and hence reduce the need for resources (Nasr & Thurston, 2006). From a resource perspective, Remanufacturing enables a reduced flow of raw material. However, the energy consumption may not be affected significantly since the energy-usage within a life cycle may be heavily balanced towards the usage-phase rather than production (Gutowski et al., 2011).

The closest loops comprise reuse, redistribution, upgrading and maintenance of goods (Ellen MacArthur Foundation, 2013a; Stahel, 2013). Each of these activities are focused on increasing the lifespan of products and possibly allowing multiple lifecycles. It is also here, in the closest loops, that the largest competitive advantage can be found (Stahel, 1998). It is important to have a holistic view on the possible applications of reusing a certain product. In the report by Ellen MacArthur Foundation, cascade use is presented as another option of reusing a product. Cascade usage allows waste for one industry to become a resource in another industry. The value chain is enhanced and the value gained from material is increased (Ellen MacArthur Foundation, 2013a).

### **3.2.3 Driving forces for Circular Economy**

The reasons to why companies would consider moving towards circular economy are numerous, but can be divided into two main segments: environmental and economic. However, these segments are heavily intertwined and below some arguments will be explained and connected to one another.

One of the major, if not the major, arguments for turning to a more circular and sustainable economy is resource depletion (Nguyen et al., 2014; Bocken et al., 2014; Wells & Seitz, 2005; Winkler, 2011; Bonciu, 2014; Stahel, 1998; Preston, 2012). The reason to why the resources are being depleted is as explained above connected to the linear “take-make-dispose” approach that has been prevalent since the industrialization (McDonough & Baumgart, 2002). The access to new resources, such as oil, ore and other natural resources, has been infinite in thought and hence there was no need to create loops to utilize resource more effectively (Ellen MacArthur Foundation, 2013a). Also, there has been and is still a steadily growing demand for products. The population is continuously growing and by 2030 it is estimated that around 3 billion people from developing countries will enter the middle class (Nguyen et al., 2014). This will put even greater demands on the resource utilization if presumed that the western materialistic way of life is the ideal. In the report by Ellen MacArthur Foundation (2013a), it is claimed that even the most conservative projections for global economic growth predicts an rise with about 30% in demand for natural resources such as oil and iron-ore. An increased demand for resources will also increase the need for transports. All of the above mentioned reasons will lead to higher resource prices and a more volatile resource market (Ellen MacArthur Foundation, 2013a). Additionally, many of the resources needed in the industry are mined in politically unstable countries. This opens up depending companies to greater risk and has the possibility to create an even more volatile resource market (Ellen MacArthur Foundation, 2013a).

The growing environmental awareness among consumers is another drive force for companies to become more sustainable in their business execution. If a company does not apply a more sustainable approach there is a risk that the brand value becomes eroded (Lacy et al., 2014). A less favorable brand

value can cause customers to turn away from a company and hence impact the revenue stream negatively.

### 3.2.4 Benefits of Circular Economy

In the report by Ellen MacArthur Foundation (2013a), the possible gains from a circular economy are analyzed in the context of society, company and customer with the goal of creating a win-win-win situation, see figure 3.3. The environmental is most likely the biggest societal reason. However, unless companies will be able to make profit or suffer risk losing revenue there are no actual reasons for companies to change. The simple formula  $\text{Revenue} - \text{Cost} = \text{Profit}$  implies that if resource prices go up and revenue are kept the same, profit will go down. That is a very clear incentive for companies to take action.

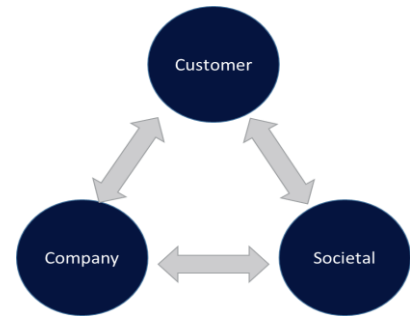


Figure 3.3 Win-Win-Win of Circular Economy

#### **Societal Benefits**

A more circular economy would affect the environmental impact of both waste, emissions and resource depletion (Ellen MacArthur Foundation, 2013a). As argued by Geng et al. (2012), circular economy incentives can bring comprehensive environmental benefits, which include conservation of natural resources. Furthermore, Geng et al. (2012) argues that the circular economy have the potential of improving social relations between industrial sector and local societies. This could in turn result in employment opportunities from new business, improved public environmental awareness and public health level. Spreading the concept of Circular Economy requires improvement in the public education mechanism (Xinian & Yanfu, 2011). Hence, spreading the word of circular economy also opens up opportunities to further increase the public environmental awareness.

#### **Company Benefits**

Embracing a system of returning loops of technical material has the potential of generating new business opportunities to many companies. According to Accenture, the circular economy offer companies a trillion-dollar opportunity (Lacy et al., 2014). Returning material loops also offer companies *“a guaranteed access to its own resources, at known resource cost, and choice of optimal reuse strategy”* (Stahel, 2010, p.96).

Furthermore, synergy effects can be found in the utilization of the companies’ supply chains as a consequence of having both reverse and normal supply chains running in parallel. Remanufacturing and refurbishment offer great opportunities for companies, however it requires the company to develop new skills in order to handle these operations. Apart from the saved resources connected to remanufacturing and refurbishment, synergy effects from utilizing already existing sales and aftermarket networks can be reaped (Ellen MacArthur Foundation, 2013a). It also offers companies opportunities to tie closer bonds to existing customers as well as building relationships with new customers. Along with recycling, remanufacturing and refurbishment can have substantial effects on the material cost.

In an attempt to entering emerging markets the concept of Circular Economy, and especially functional sales can be used as a competitive advantage. Companies’ individual products may not be as competitive as those provided by competitors, but by using a new approach to providing the market with functionality instead of products a company may offer a competitive edge.

#### **Customer Benefits**

The first benefit that is of interest for customers may be that of significantly lowered total cost of ownership (TCO). Returning material loops reduces premature obsolescence and for the customers this could bring down the TCO (Ellen MacArthur Foundation, 2013a). For example, the *“power by the hour”* concept by Rolls Royce offer the customer a possibly improved cost structure due to lower initial cost

and less stock keeping. Also, recycled material as well as refurbished and remanufactured products also holds the potential of offering products at the same quality at a lower price. Furthermore, the within a Circular Economy choice and conveniences are increased, due to the fact that today's standard purchase is replaced by producers interest of tailoring durations, type of use and components to specific customer needs (Ellen MacArthur Foundation, 2013b). Worth mentioning, is that customer also will benefit from secondary aspects, such as reduction of environmental costs.

### 3.3 The Business Model

Since the dotcom burst in the 2000s, the economic world has been increasingly populated by the term BM (Doganova & Eyquem-Renault, 2009). Management willingness and request to understand how business work and how value is created for different stakeholders has increased (DaSilva & Trkman, 2014). Hence, the term BM has become more widespread and frequently used. However, the academic literature on this topic is fragmented and inconsistently used with different definitions (George & Bock, 2011). According to DaSilva & Trkman (2014), the term BM was first mentioned in an academic article by Bellman et al. (1957). BM was at that time described as *"a simulation of the real world through a model"* (DaSilva & Trkman, 2014, p.380). A description that by all means is open for interpretation by a specific situation and its actors. In an attempt to clarify the concept of *Business Models*, Osterwalder et al. (2005, p.2) reflects on the semantics behind the concept by interpreting the words *business* and *model* separately:

**Business** is *"the activity of providing goods and services involving financial, commercial and industrial aspects"*.

**Model** is *"a simplified description and representation of a complex entity or process"*.

Combining the words, Osterwalder et al. (2005, p.3) propose that the concept of a BM must go in the following direction.

*"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences"*.

The definition implies that a BM should, on a simplified level, conceptualise and define what and how a company should work and the outcome of those actions. Taking this argument further, George & Bock (2011) states that the underlying dimensions of a BM consists of; resource-structure, transactive-structure and value-structure. First of all, the resource-structure is defined as *"the dynamic capability that links the firm's distinctive competencies to organizational aspirations and outcomes"* (George & Bock, 2011, p.86). This implies that a BM intends to describe how a firms competences are connected to the ambition and intended outcome of the business. Secondly, the transactive-structure refers to the BM as *"a unifying mechanism describing the content, structure and governance of transactions"* (George & Bock, 2011, p.88). Lastly, the value-structure refers to a BM as system of rules, expectations and mechanism that are institutionalized with the purpose of create and capture value.

Combining the underlying dimensions presented by George & Bock (2011), one could say that a BM should illustrates how an organisation use resource-structures to create value, transactive-structure to deliver that value and its value-structure in order to capture value. This way of describing a BM strongly reflects the definition given by Osterwalder et al. (2012, p.14):

*"A business model describes the rationale of how an organization creates, delivers and captures value"*

According to the definition by Osterwalder et al. (2012), the essence of a BM is related to value. The term value is per se highly subjective and can in practice be difficult to articulate. In the context of a BM, the essential activity is to create and deliver value to customers. Generating enough value to customers should entice payments which in turn could be converted into profit. The conceptual description and architecture of this process should be described by a firms BM (Teece, 2010).

### 3.3.1 Connecting Business Model and Strategy

The boundary between BM and strategy is subtle. Porter, a prominent figure within strategy literature, define strategy as; *“how all the elements of what a company does fit together”* (Porter, 2001, p.71). At the same time, Magretta (2002, p.91) use almost the same words to define a BM; *“a system, how the pieces of a business fit together”*. On the surface, the notion of a BM appears similar to that of a strategy (Casadesus-Masanell & Ricart, 2010). However, it is important in this context to clarify that strategy and BM should be interpreted as separate concepts. Casadesus-Masanell & Ricart (2010) argues that a BM reflect a firms realized strategy. Furthermore, Teece (2010) argues that the BM is more generic than a business strategy. Hence, conceptual differences exist when differentiating a BM from strategy. DaSilva & Trkman (2014) illustrates the differences by presenting in which time perspectives the different concepts are appropriate. As illustrated in figure 3.4, strategy is used in a long-term perspective whereas the BM is used in short-term. The picture also illustrates that a strategy provides the dynamic capabilities which constrain a possible BM.

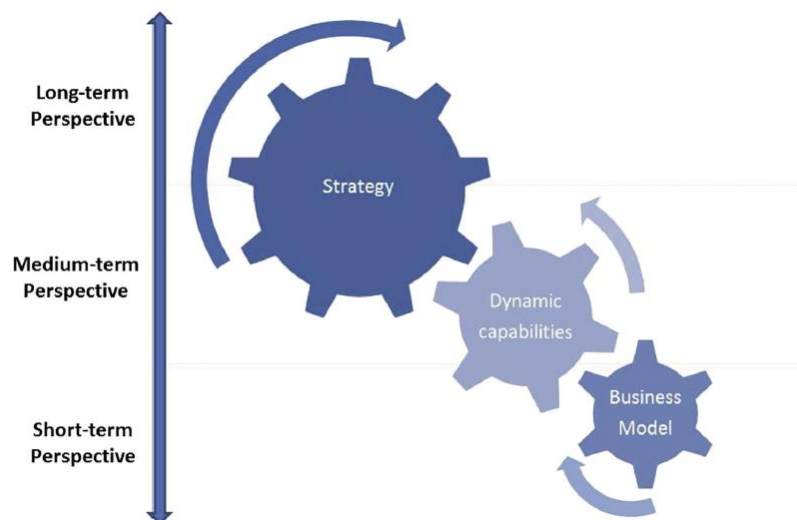


Figure 3.3 Connecting Strategy and Business Model

Source: DaSilva & Trkman (2014).

### 3.3.2 Business Model Canvas

The business model canvas (BMC) is a tool developed by Alexander Osterwalder and Yves Pigneur. It is intended to facilitate and visualize the process of creating and analyzing BMs and is described as “A shared language for describing, visualizing, assessing, and changing business models” (Osterwalder & Pigneur, 2012, p.12). The BMC can be divided into three overarching segments that describes the underlying purpose, see figure 3.5. The center segment “*Defining Value*” articulates and specifies the value that the BMs aims to generate. The segment on the right in the canvas, “*Delivering Value*”, articulates to whom and how value should be delivered. Lastly, the left side of the canvas, “*Creating Value*”, articulates how value is created and the cost involved in creating that value.

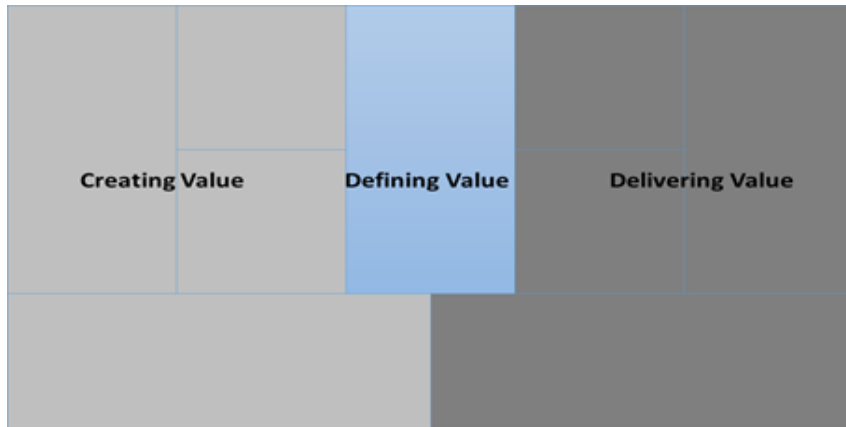


Figure 3.4 Segments of the Business Model Canvas

The BMC consists of nine building blocks ,see figure 3.6, that together comprise customers, infrastructure, offer and financial viability, i.e. the principal areas of business. By explaining each of the segments, a BM can be developed or explained in a highly comprehensive way. Each of the building blocks are presented below.

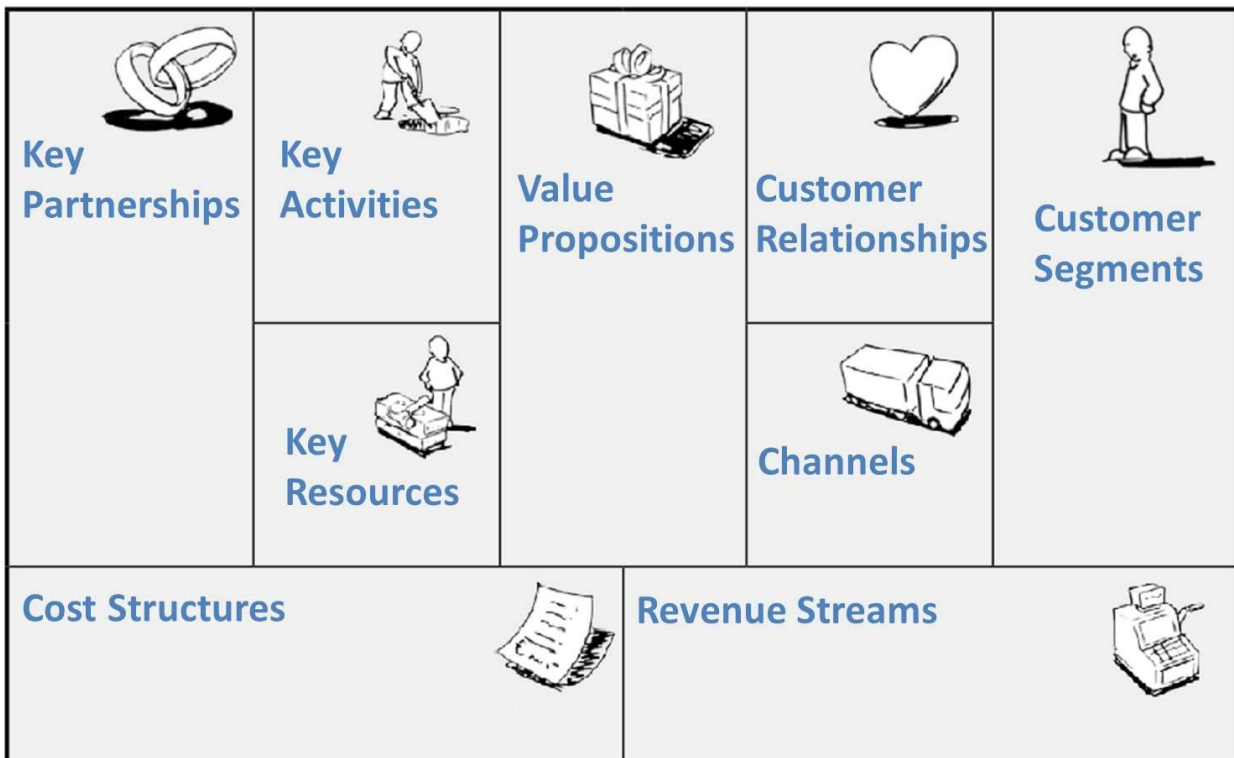


Figure 3.5 Business Model Canvas

Source: Conlinnewlyn (2015)



### Customer Segments

Customers are the audience at whom a certain product or service is aimed. Important to remember is that the customers are the core of every BM. In order to target the right group of customers, a company must carefully choose which segments to attempt to reach and which segments to neglect (Osterwalder & Pigneur, 2012). The segmentation allows a company to get a clear understanding of how the customers vary in terms of needs and preferences. Needs and preferences impacts how a customer wish to have the product or service delivered, i.e. distribution channels, which type of relationship with the company a customer seeks and how profitable each segment is considered. Examples of different customer segments are presented in table 3.1 below.

Type of customer segment	Aim and characteristics
<b>Mass market</b>	Directed towards a broad mass, market is based on similar customer needs and preferences. Offerings are standardized.
<b>Niche market</b>	Targets a narrowed and specialized customer segments. Solutions are tailored to meet the specific customer demands.
<b>Segmented</b>	Aimed at customers divided into segments, that differ little in terms of needs and preferences. Each segment has a slightly adjusted value proposition
<b>Diversified</b>	Aimed at customers that are strictly segmented due to highly differing needs and preferences. Each segment has a distinct value proposition.
<b>Multi-Sided market</b>	Aimed at segmented customers but where both customers and value proposition is interdependent.

Table 3.2 BMC - Type of customer segments

### Value proposition

The building block called *Value Proposition*, describes the combination of products and services that creates value to a specific customer segment. Osterwalder & Pigneur (2012, p.22) define value proposition as; “*the reason why customers turn to one company over another*”. A value proposition aims to create value for its designated customer segment. What a specific customer segment consider as value creating is highly subjective and can consist of quantitative, qualitative, tangible and intangible measures. Osterwalder & Pigneur (2012) presents a list of examples that explain different ways of how a proposition can contribute to customer value creation, see table 3.2.

Type of customer value	Customer value is generated by:
<b>Newness</b>	Focusing on delivering a completely new type of offering, aims at satisfying entirely new set of needs.
<b>Performance</b>	Providing products and services where their performance have been improved.
<b>Customization</b>	Products and services that are tailored to specific customer needs.
<b>Getting the Job Done</b>	Helping customers to get specific jobs done. Enhance customers to focus on their core business.
<b>Design</b>	Focusing on providing customers with good design on product and services.
<b>Brand/Status</b>	Using brand value/status to gain good reputation and generate customer value of products or services.
<b>Price</b>	Offer product and services similar to those of competitors, but to a lower price.
<b>Cost Reduction</b>	Helping customers to reduce cost related to operating their business.
<b>Risk Reduction</b>	Helping customers to reduce risks related to a purchase of a product of service.
<b>Accessibility</b>	Providing accessibility to products and services, e.g. new technology
<b>Convenience/Usability</b>	Changing the way products are used, e.g. making product and services easier to use.

Table 3.3 BMC - Type of customer value

### **Channels**

Channels describe how a company communicate and connects with its different segments. It is through the channels of communication, distribution and sales that companies interact with their customers (Osterwalder & Pigneur, 2012). These can be direct, indirect, owned or partner channels. Common for both is that they are crucial to the contact between the customer and the company. The channels serves, among others, the functions of marketing the company and providing support.

### **Customer Relationships**

This building block of the BMC clarifies what type of relationship companies should establish with each Customer Segment. According to Osterwalder & Pigneur (2012) customer relationships can be driven by customer acquisition, customer retention or to boost sales. Common for all types of customer relationships is that they deeply influence the overall customer experience and hence also affects the perceived value to the customer. In table 3.3 are examples of customer relationships given by Osterwalder & Pigneur (2012).

Type of relationship	Characteristics
<b>Personal assistance</b>	Based on human interaction, i.e. customers can interact and communicate with real representative from the company.
<b>Self-Service</b>	No direct relationship between the company and customer. The company provides necessary means for their customers to help themselves.
<b>Automated Service</b>	A mixture of self-service and automated processes, e.g. service through a personal online profile where customers can access a customized service.
<b>Areas</b>	Customers communicate through a customer-platform provided by the company. Companies can learn more about customers by monitoring the platform.
<b>Co-Creation</b>	Customers and company work tightly together. Customer are involved to a bigger extent and value is co-created between company and customer.

Table 3.4 BMC - Type of relationships

### **Revenue Streams**

The revenue streams unveils the ways a company is to generate income. The revenue streams are affected by pricing mechanisms such as fixed list prices, auctioning or volume dependent. A company can have revenue streams of two sorts: a one-time income deriving from customers acquiring a product or service, Transaction revenue, or continues payments due to a continuous service or post-purchase services, Recurring Revenues. The revenue streams can be generated in many ways, some examples given by Osterwalder & Pigneur (2012) are listed in table 3.4 below:

Type of Revenue Stream	Revenue is generated through:
<b>Assets Sale</b>	Classic buyer-seller scenario. Ownership to a physical product is changed through a transaction.
<b>Usage Fee</b>	Allowing customers to utilize a certain service. Customers pay for the amount of service used.
<b>Subscription Fees</b>	Selling continuous access to a service, e.g. newspaper subscription
<b>Lending/Renting/Leasing</b>	Charging customer for giving them exclusive right to utilize a product or service.
<b>Licensing</b>	Charging customers when they are using an intellectual property, i.e. companies that holds a patent or copyright to a product can license utilization and charge their customers for usage of those products.

Table 3.5 BMC - Type of revenue streams

### **Key Resources**

Represented in the building block named Key Resources, are the assets that are most important and required in order to make a BM work. The resources enables a company to create and offer a value proposition to a designated customer segment. Osterwalder & Pigneur (2012) presents four categorize of key resources, see table 3.5;

Type of Key Resource	Characteristics
<b>Physical</b>	Includes tangible assets such as facilities, machines and distribution networks
<b>Intellectual</b>	Includes intangible assets, e.g. brand, patent, copyright and customer databases
<b>Human</b>	Resources directly connected to humans and their knowledge. Often considered Key Resource within knowledge-intensive and creative companies.
<b>Financial</b>	When key resources consist of liquid found, e.g. banks, investments companies and venture capital companies.

Table 3.6 BMC - Type of key resources

### **Key Activities**

Key Activities are the actions that are required by a company for them to successfully operate their BM and to deliver their value proposition. Osterwalder & Pigneur (2012) uses three different categorize to describe key activities, see table 3.6;

Type of Key Activities	Characteristics
<b>Production</b>	Activities related to tangible products, e.g. design, making and deliver products.
<b>Problem Solving</b>	Solving an individual customer problem, i.e. customise a solution. Knowledge management and training is often considered key activities in these situations.
<b>Platform/Network</b>	When a business model is design around a platform, key activities are focused on operating, maintain and develop that platform, e.g. Visa's credit card transaction platform.

Table 3.7 BMC - Type of key activities

### **Key Partnerships**

The building block furthest to the left in the BMC describes the network of suppliers and partners that enables a BM to work. The reasons to why companies create alliances or enter partnerships are many. Often, the aim and motivation to enter a partnership is to optimize the performance of a BM, reduce risks or simply a way to acquire resources. Osterwalder & Pigneur (2012) distinguish four different types of partnership, se table 3.8.

Type of Partnership	Characteristics
<b>Strategic</b>	Alliances between non-competitors
<b>Coopetition</b>	Strategic partnerships between competitors
<b>Joint Venture</b>	Collaboration that aims to develop new business
<b>Buyer-Supplier</b>	Relationships to assure reliable suppliers

Table 3.8 BMC - Type of partnership

### **Cost structure**

The building block named Cost Structure, aims to present costs associated with the certain BM. All activities presented in the BM; creating and delivering value, customer relationships and revenue generation, can all incur costs. The cost structure is of importance since it is directly connected to companies' profitability, but also highly connected to how the company aims to do business. Cost structures can be divided into two main categories, cost-driven or value-driven (Osterwalder & Pigneur, 2012). A company that attempts to create value by keeping the prices down is referred to as cost-driven. A company that is less concerned with keeping the prices down for the customer and instead focus on value creation is referred to as Value-driven. The cost structures have different characteristics two of

the most common are fixed and variable costs. The fixed costs are independent of the produced volume and remain fixed whereas the variable costs fluctuate in connection to the produced volume.

### 3.3.3 Value Proposition Canvas

The value proposition canvas (VPC), is an extension of the BMC, see figure 3.7, and delves into two of the BMC's nine building blocks, namely Value Proposition and Customer Segment. The tool consists of two sides, a Customer Profile and a Value Map (Osterwalder et al., 2014). The desirable effect of using this tool is to achieve match between the value map and the customer profile, and by that verify that value proposition will have a market fit.

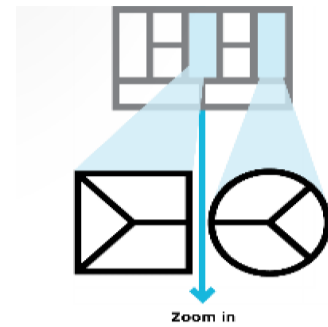


Figure 3.6 Connection between BMC and VPC

#### Customer Profile

In the customer profile, the aim is to clarify the understanding of the designated customer segment. The profile template consists of three areas, Customer Jobs, Customer Pains and Customer Gains, see figure 3.8. Customer Jobs aims to describe things that the customer are trying to get done in their work, i.e. task that they try to perform, problems that they are trying to solve or need that they are trying to satisfy. Customer Jobs can be divided into functional jobs, social jobs, personal/emotional jobs and supporting jobs (Osterwalder et al., 2014).

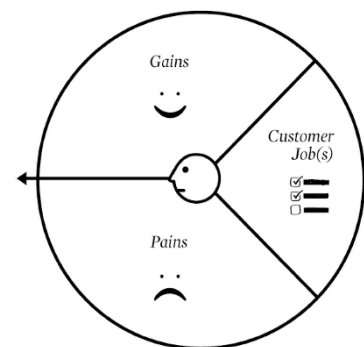


Figure 3.7 VPC - Customer Profile

Customer Pains aim to describe anything that annoys customer before, during and after they try to get their job done. This section also aims to map things that prevent customers from performing their job, as well as describing risks that customers associate with their jobs (Osterwalder et al., 2014).

Customer Gains aims to describe outcomes and benefits that are desirable from the customer perspective. Gains can be categorized into, required gains, expected gains, desired gains and unexpected gains. Required gains are basic expectations, without these a solution wouldn't work. Expected gains are gains that customers expected from a solution even though it could work without them being present. Desired gains go beyond customers' expectations, however if they were present they would boost customer satisfaction. Lastly, unexpected gains are those that go far beyond customer expectations. Even if customer are asked, they wouldn't be capable of coming up with these gains because they are so far from their expectations (Osterwalder et al., 2014).

#### Value Map

The value map is a clarification of the Value Proposition given in the BMC and contains sections describing Products and Services, Pain Relievers and Gain Creators, see figure 3.9. Product and Services is basically a description of what is offered to the customers. Osterwalder et al. (2014) uses the metaphor of Product and Services as list of items that customers can see through your business shop window. Products and services that are listed should be used to build up the value proposition and can include physical (tangible), intangible, digital and financial (Osterwalder et al., 2014).

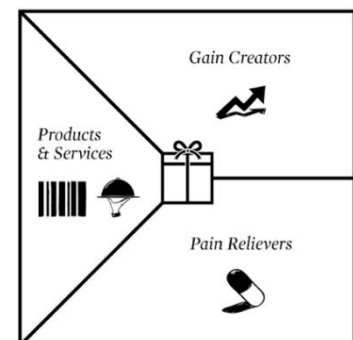


Figure 3.9 VPC - Value Map

Pain Relievers, describe how the suggested product and services aims to ease specific customer pains. According to Osterwalder et al. (2014), no value proposition is capable of facilitate all pains perceived by a customer. Therefore, a great value proposition is capable focusing on the pains that matters to customers, i.e. focus on a few pains and ensure that they are obviated extremely well. Lastly, in the section Gain Creators the intention is to outline of the suggested Product and Services intends to create customer gains (Osterwalder et al., 2014).

### **3.5 Moving towards a Circular Business Model**

In the literature describing the move towards circular economy, a lot of emphasis is placed on describing how a change in product design is necessary in order to enable a system of material loops. In addition to changing product design, companies can also rethink how products are sold and used. More specifically, BMs are an important part in how sustainable product and services are brought to the market (Beltramello et al., 2013)

#### **3.5.1 Business model innovation**

Increased market competitiveness and changing customer demands has forced many product-based companies to change their way of making business. Many companies are moving towards models that are based on service and integrated solutions (Kindström, 2010), table 4.1 presents examples of. The new way of setting up business requires a change and innovation in companies' BMs. According to Markides (2006, p.20), business model innovation (BMI) can be defined as *"the discovery of a fundamentally different business model in an existing business model"*. In other words, BMI is about redefining existing products or services rather than discovering new ones. Hence, a redefinition of products and services implies that value has to be generated and captured in new ways. As argued by Chesbrough (2007,p.12), *"A better business model often will beat a better idea or technology"*. The question is how to balance the aspects of those that create value and those that help to capture value. A disruptive technology could enhance the value creation. However, as long as customers aren't able to capture value from the technical solution, the value added by such technology will be limited. In the end, BMI is all about creating value - for companies, customers and society (Osterwalder & Pigneur, 2012).

#### **3.5.2 Product Service-systems**

As mentioned above, BMs focused on service and integrated solutions are growing in number. Moving from a product-centric offering to a more integrated solution is broadly referred to as servitization. A special type of servitization is a product service-system, (PSS), (Baines et al., 2007). According to Tukker & Tischner (2006, p.1552), PSS *"consists of a mix of tangible products and intangible services designed and combined so that they jointly are capable of fulfilling final customer needs"*. A PSS is hence an offering combining a product with additional services that in combination provides performance and value.

By adding services to the product offering, PSS offers companies' new opportunities to differentiate themselves in a commoditized market (Tukker, 2015). Switching to a more integrated solution may change the measures on which an offering is considered. According to Baines et al. (2011), production usually focuses on cost, quality and delivery whereas an integrated solution instead focuses on performance, availability, reliability and cost. This difference is similar to what Tukker & Tischner (2006) describes as the *"real strength of PSS thinking"*: the focus on the need and function demanded by the customer. By switching from a pure product-offering to a PSS there is a great possibility that the incentives within the company will change (Tukker, 2015; Tukker & Tischner, 2006). A company that is looking to satisfy the needs of a customer rather than designing the perfect product will have a different perspective on how to increase revenue, market shares and generate profits. In a classic product-focused setting, an increased volume is the primary method of economic prosperity. In a PSS setting, the

primary method of achieving economic prosperity is to accommodate the needs of the customer at an as-low-as-possible cost (Tukker, 2015).

Another benefit with PSS that is emphasized is the opportunity to increase and/or transform the position in the value chain (Tukker & Tischner, 2006; Tukker, 2015; Baines et al., 2007; Smith, 2013). An increased and transformed presence in the, see figure 3.10 value chain offers companies opportunities to differentiate the offering and also to be in a closer connection with the customer, hence being able to generate greater revenue and gaining better understanding of the customers (Smith, 2013; Tukker, 2015).

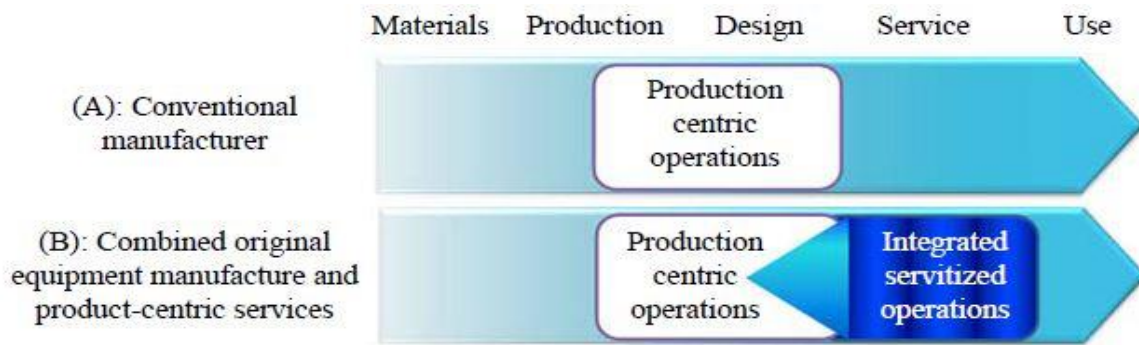


Figure 3.8 Product Service System

Source: Bains et al., (2011) Altered

### 3.5.3 Circular Business Model

The debate concerning societies' unsustainable consumption of resources and the need to go from a linear to circular economic system highly affects what type of business that will succeed in the future (Ellen MacArthur Foundation, 2013b). The focus is on how firms can use BMI to capture more value (Speith et al., 2014). As stated by Bakker & den Hollander (2014), *"the most promising circular business strategies will be those that focus on capturing value from extended product life"* (Bakker and den Hollander). Circular thinking within BM require manufacturers to think of the resources within their products as assets rather inputs and customers should be seen as users rather than buyers. Co.Exist (2013) present five businesses model that according to them are driving the circular economy. The concepts behind each of the five BMs are presented below.

- **Product as services** – companies that normally produce and sell goods embrace the idea of themselves as service providers. Instead of selling products or services these companies starts to lease access to a service or product.
- **Next life sales** – in this concept companies focus of closing material loops, providing a next life for materials and products. Necessary for this to work is that companies efficiently can recover and re-condition products after use and then reintroduce the products into the market again, enabling a second and third chance for the company to earn money.
- **Product transformation** – reconditioning is not a suitable alternative for all products. However, most products have single components that carry high value and could be reused in other applications. The idea with product transformation is that components can be put together and form new products that serves a new purpose and provides new value.
- **Recycling 2.0** – innovations and technology within the recycling industry has made it possible to benefit from sustainability performance by recycling waste from one product when producing a new product.

- **Collaborative consumption** – the idea behind this way of making business is to provide platforms and areas that intend to increase the shared-use among consumers and advocate a collaborative consumption. A illustrative example is the internet-platforms, such as eBay, where consumers can trade second hand products. Through internet and social media, this way of making business has become a growing phenomenon.

PSS is considered by many to be an effective way in which to become more sustainable and move towards a more Circular Economy (Tukker, 2015; Baines et al., 2007). The impact and opportunities a PSS can provide presents incentives to companies to become more effective and frugal in terms of resource utilization (Stahel, 1998; Tucker & Tischner, 2006). The value provided to the customer by a PSS has the potential of meeting the needs of customers through not only the functionality of a product but also through the additional services.

By shifting focus from what abilities a product holds to focusing on fulfilling the needs of a customer, the producing company is presented with opportunities to lower the resource utilization (Tukker 2015). A PSS can shift the way companies strive towards economic prosperity and this shift will have a positive impact on the resource utilization and also the environmental impact.

There are a number of examples of companies that have taken steps towards or even completely turned to a serviced-based offering and sell a function instead of a product. As described in Philips (2014), the company has shifted from selling light as “one time sale” to “Light as a Service”. During such a contract, Philips maintain ownership of all material and by managing the service extend the lifetime and performance of their products. Providing light as a service also enables customer to take full advantage of the newest technology solutions, increase energy efficiency and reduced their operational costs. Selling light as a service also opens up opportunities to Philips as a company. New value can be captured by exploring the possibilities from a second hand market, where used parts and luminaires can be reused. At the end of service, used products are naturally returned to the production processes to be refurbished, harvested on useful components or put into a recycling loop.

By redesigning and rethinking the system of making business, new opportunities will be opened to companies. With a circular business model (CBM), the system boarder is moved forward in the value chain and praxis of making business will change from a one-time transaction into a long-term service relationship. This implies a BM where customers and companies work in a closer collaboration resulting in better alignment between interest of customers and companies (Ellen MacArthur Foundation, 2013b).

## 4. Empirical Study

The following chapter will present the compiled data collected through the study. The data collection was as described in section 2.2 Research Design, divided into two simultaneous processes, one for the current business model (BM) and one for the circular business model (CBM). The collected data was used to map the current BM and to create a CBM in accordance to the business model canvas (BMC).

### 4.1 Scania's Current Business Model

Scania's current BM was mapped through a series of interviews with employees from different business units within the company. Cases from different business areas, i.e. Scania Rental, Scania Mining, Platooning, were studied. The general BM presented below is a compilation of all studied business areas and is presented in figure 4.5. The detail level in the BM description is by the researchers deliberately simplified in order to be applicable to a wider span of business areas.

#### **Customer Segments**

As stated in section 1.3 Delimitations, this thesis will focus on the business segments of trucks. In 2014, the truck segment corresponded to 82,9% of the total number of delivered units within Scania, which in turn corresponded to 62,5 % of the total delivery value <sup>1</sup>(Scania AB, 2015a). The product offer in the truck segment is according to Scania divided into four categories; *Long-Haulage*, *Distribution*, *Construction* and *Special-purpose trucks* (Scania AB, 2015c). Based on this categorization, the researchers have discovered that in Scania's current BM, the customers are categorized by what type of transport they like to perform.

#### **Value Proposition**

As stated in Scania Sustainability Report 2014, "*Scania provides value to their customers through high-quality products and services that enhance customers' profitability*" (Scania AB, 2015d, p. 13) During an interview with a Product Manager from Scania's sales and marketing department, it was claimed that products and/or services are sold to a customer in the majority of Scania's sales-transactions. The customer uses monetary funding in order to gain ownership of a product or service. Based on this, the value proposition of Scania's current BM as being centered on selling products and services.

#### **Channels**

According to Scania's internal SAIL-portal, the sales and distribution channels in the current BM is described in the following way. Scania's captive markets are divided into five regions spanning globally. Each region is divided into business units consisting of distributor(s), dealers and workshops. Distributors act as importers of trucks and are in charge of the wholesales and distribution network within their business units. From the national distributors trucks are distributed to local dealers that are in charge of sales and distribution of new Scania products and after-sales services within an assigned district. The workshops are exclusively responsible for after-sales services. The dealers and workshops can either be Scania owned or private owned (franchised).

As implied by the description above and attested during an interview with a Sales Director at Scania, the sales and distribution channel more or less follows a linear approach. Products are pushed from the Scania Factory to distributors, to retailers and then sold to what is called end-customer acting in the so-called aftermarket, see figure 4.1. As the figure shows, an actor is only responsible and interested in the products until it has been transferred to its subsequent actor, e.g. from the Scania Factory to distributor, and when the products have reached the distributor it is no longer in the Scania Factories responsibility or interest. The underlying incentive is that volumes of products should be pushed in one direction and

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<sup>1</sup> Total delivery value includes revenue from selling; trucks, buses, industrial engines, services, used vehicles and other.



revenues in the returning direction. The principle is that bigger volumes will generate bigger revenue in return.



Figure 4.1 Current sales and distribution channels

In the mapping of the communication channels of the current BM, the researchers discovered that the communication interface between Scania and their customers unfolds at the outer end of the Scania value chain. During interviews with a Managing Director from one of Scania’s customers, the researchers found out that in many cases, a service or product purchase has its designated contact person. The Managing Director illustrated this by using the model presented in figure 4.2. As the Managing Director expressed, each of the surrounding functions has its own contract and contact person, i.e. they are managed through an individual communication channel.

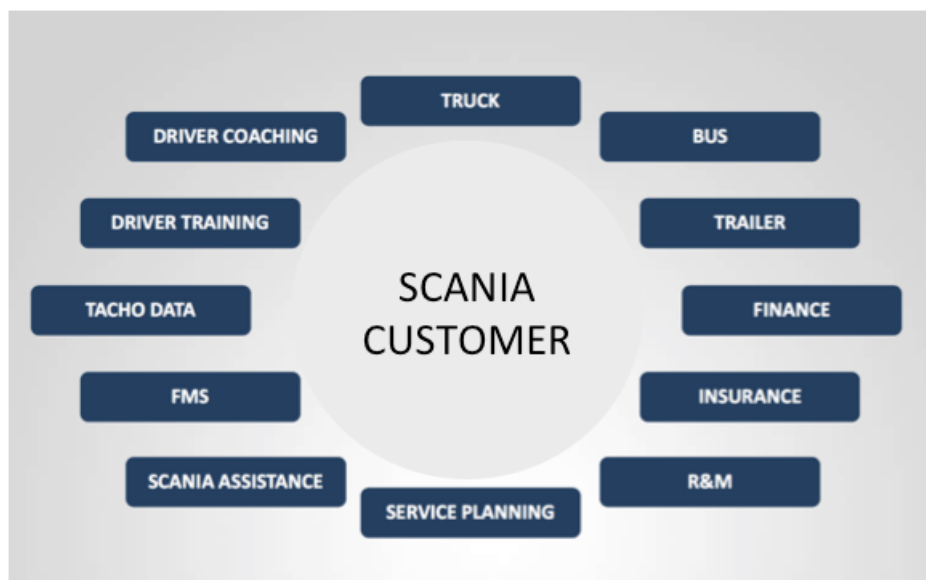


Figure 4.2 Current communication set-up

**Customer Relationships**

One of Scania’s core values is Customer First, and as stated in the recent annual report, “Through close dialogue, Scania builds partnerships with transport companies and buyers of transport services” (Scania AB, 2015a, p.12). This statement implies that Scania actively works and communicates with its customers to help them find a suitable product or service. However, it does not say anything about how Scania conducts this dialogue.

As found out during the mapping of Scania’s current sales and distribution network, the interface between Scania and their customers unfolds at the outer end of the Scania value chain. As a Managing Director to one of Scania’s customers expressed during an interview, the company has many different contact interfaces with Scania and each relationships are in general built around the sales of a product or service. The Managing Director also expressed during these sales, there is in general a transaction where an artifact switches ownership based on a certain purchase price.

Worth mentioning is that the situation described above is not applicable to all of Scania's business areas. For example, in business areas such as *Scania Defence*, *Scania Mining* or *Scania Rental*, the company has a close collaboration with its customers. However, these collaborations are connected to very specific cases and not applicable to the broader mass of Scania's business, which the researchers also identified when conducting interviews with employees at Scania and external customers. Therefore, it is the researchers' intention to describe most part of Scania's customer relationships as transactional. This way of describing the customer relationships was also supported by the findings from an interview with a Business Analyst from one of Scania's Research and Development departments.

### Revenue Streams

Scania's revenue is generated through sales of *Vehicles and Engines*, *Repair and maintenance*, *Financing and insurance* as well as sales of *Used vehicles*, see figure 4.3. In 2014, sales of *Vehicles and Engines* corresponded to 72% (of which almost 87% from trucks-sales) of the total revenue from external customers. *Repair and maintenance* corresponded to 20%, *Finance and insurance* 5% and sales of *Used Vehicles* 5,5%.

During interviews with a Product Manager and a Sales Director from Scania's sales and marketing department, the researchers found out that Scania basically has three different payment methods; cash purchase, finance lease or operating lease. In the interviews, it was also stated that the main part of all payments from the customer is made in order to gain the ownership of a product or service in return. Hence, it could be argued that Scania's revenue streams are structured around a principle of selling products and services to a customer who becomes the property owner.

### Key Resources

By conducting interviews with employees from different departments within Scania, see table 2.2 in section 2.2.2 *Empirical Data Collection*, the researchers found out that different departments consider different resources as Key Resource. Still, some common denominators were identified and the interviewees agreed that these resources could be seen as general key resources. The identified key resources are; production, know-how and Scania's modular system.

**Production facilities** – As described during an interview with a Product Manager, without high-performing products, Scania's customers would have limited chances of being profitable. Therefore, it is of high importance that Scania provides their customers with high quality products. A necessary step in reaching this goal is to have the capability to produce high quality trucks. Scania's production facilities are therefore considered as one of the company's key resources.

**Know-how** – Know-how is a mixture of technical knowledge, regarding products and services, and understanding customers' wants and needs. Without connecting technical and customer know-how it is hard to find a fit between the product and designated market, making it very difficult to operate a profitable business. The knowledge regarding customers' wants and needs, is in the current BM follows the linear approach, see fig 4.4.

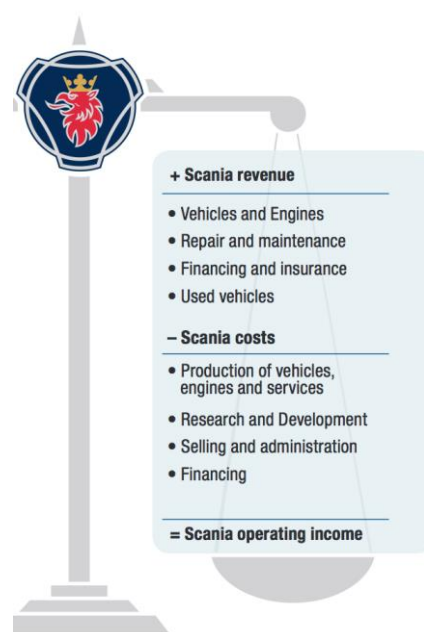


Figure 4.3 Scania's revenue model  
Source: Scania AB (2015a) Altered

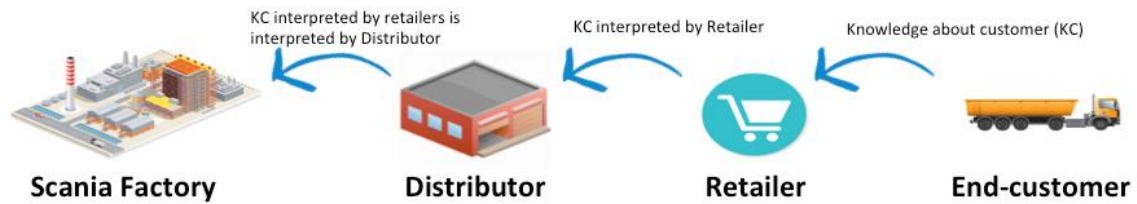


Figure 4.4 Feedback of knowledge about customer in the current BM

In each step the information is interpreted and then forwarded to the next actor, e.g. from end customer to retailer and from the retailer upwards. As expressed during consultation with a Senior Manager, the original customers' wants and needs are interpreted through a number of steps before it reaches the Scania Factory. Hence, the development of products is not always based on first-hand information.

**Modular system** – As argued by many employees at Scania, the modular system has generated a competitive advantage by enabling Scania to combine a high degree of distinctiveness in their product design with high level of commonality in a number of different parts. This mean that Scania is capable of providing their customers with great variety of products and still keep the number of unique parts at a low level.

#### Key Activities

During interviews with a Business Analyst, a Director and a Product Manager, it was advocated that Scania offers their customers high quality products and services. Hence, from a general perspective the most important activities that are performed within Scania are connected to development, production and distribution of products and services. The activities have been divided by the researchers into four categorizes; Production, Sales and Marketing, Distribution and Research and Development.

**Production** – During an interview with a business analyst, it was communicated that when Scania produces a product, it is vital to deliver it with delivery precision and high quality. In order to ensure that high-quality products are produced and delivered accordingly, a production system built upon standardized activities is established. The system is called Scania Production System (SPS).

**Sales & Marketing** – Through interviews with a Sales Director and a Product Manager, it was said that Scania's sales and marketing department is of high importance in capturing and understanding what Scania's customer value. A strong sales and marketing department can aid the organization in providing information about the customers. In addition, the sales and marketing department plays a vital role in attracting customers to purchasing Scania's products.

**Distribution** – The distribution network and its processes are considered a key activity in ensuring that a produced truck reaches the market and its customer, which is a prerequisite in selling vehicles. As stated during an interview with a Managing Director from one of Scania's customers, if Scania shall remain successful in providing customers with a high quality service during the purchase of vehicles, it is greatly important to have a reliable and well-functioning distribution network.

**Research and development** - Developing high quality products and services is dependent on having a strong and qualified research and development (R&D). At Scania there is a strong culture concerning R&D and the idea of in-house development. In a consultation with a Senior Manager, it was

indicated that this tradition of keeping development in-house has led Scania to develop a strong modular system, one of the current key resources.

### ***Key Partners***

As stated in the section above, the key activities revolve around creation and delivery of products and services. In order for Scania to produce high quality trucks they are dependent on suppliers to supply them with high quality components. Therefore, the major part of Scania's key partners is found in the initial phase of the value chain, i.e. suppliers that ensure a steady flow of high quality components that are used in Scania's products and services.

Another important aspect in the creation of high quality products and services is being able to test how customers will receive and use them. As a step in ensuring market fit, Scania has a close collaboration with selected customers. As described by the Managing Director of Scania Transport Laboratorium, their role is to validate Scania's products and services. Common for Scania's key partners, regardless of where in the value chain they are active, is that they are strongly connected to Scania's products and services.

### ***Cost Structure***

As illustrated in figure 4.3, the major cost items in Scania's current BM are; Production of vehicles engines and services, Research and Development, Selling and administration and Financing. In 2014, about 82% of Scania's costs were related to production of products and services. Research and Development activities corresponded to about 6%, almost 11% of the costs were related to Selling and administration activities and Financing corresponded to 1% (Scania AB, 2015a). As implied by the financial numbers above, the costs items in Scania's current BM are centered on producing and distributing products. Therefore, the cost structure will be described as product centered.

### 4.1.1 Overview of current Business Model

The above-described results from the empirical study were compiled into a BMC, and presented in figure 4.5. This is done to give the reader of this thesis an overview of the important aspects of the current BM. This part of the thesis will also provide the reader with an answer to the first research question:

RQ1 - How does Scania's current business model look like on a general level?

## The business model Canvas

Scania's Current BM

2015-04-27

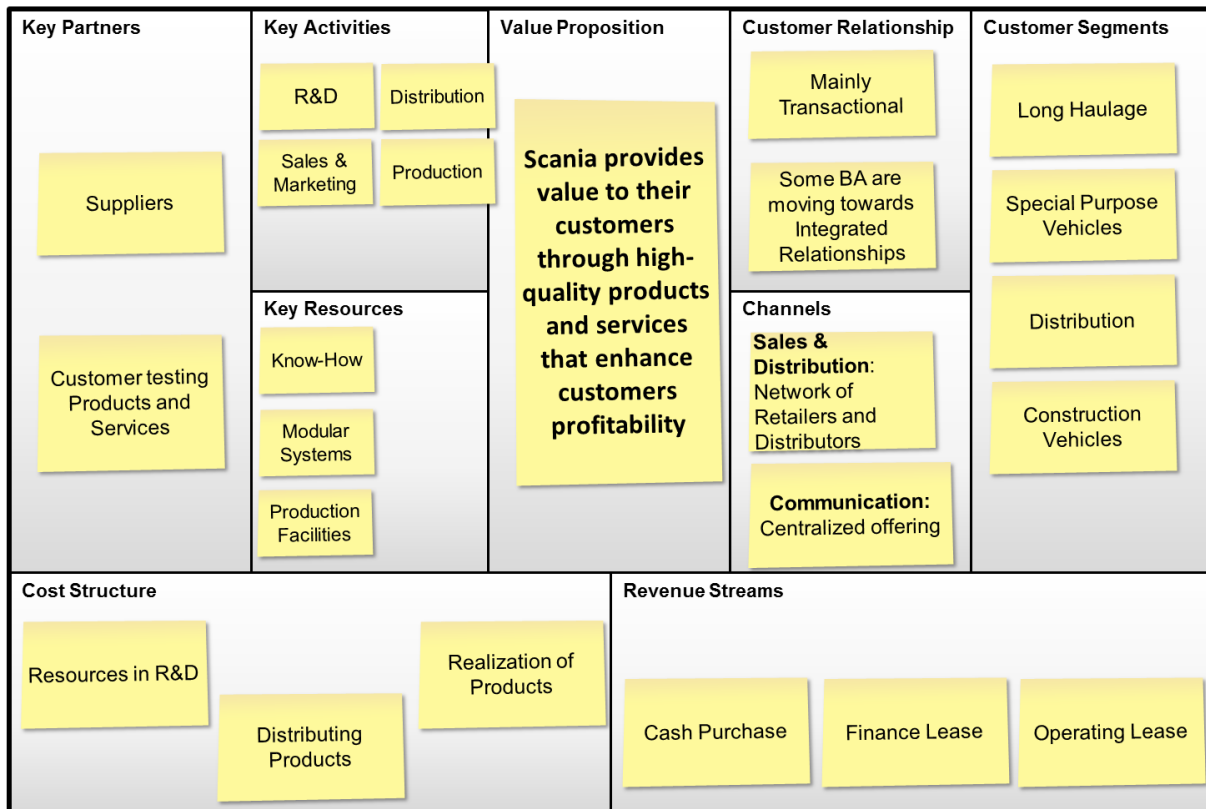


Figure 4.5 Overview picture of Scania's current BM

## 4.2 Conceptualizing a Circular Business Model

This section of the thesis describes the process of conceptualizing a CBM, which has been divided into three steps. The first step consists of defining a value proposition to the CBM. In the second step, a product and service offer (PSO) is suggested with the purpose of generating a more general consensus of what the CBM could offer. In the final step of the process, the value proposition and the PSO was compiled into a BMC that presents all building blocks of the CBM. As described in section 2.2.2 *Empirical data collection*, the findings in the empirical study are based on inspiration from external cases, a workshop and interviews with employees and Scania customers.

### 4.2.1 Value proposition Hypothesis

The initial terms of reference to the thesis requested a CBM that uses performance sales to deliver sustainable transport solutions. Based on these prerequisites, the researchers chose to study companies that to some extent have conducted a business model innovation (BMI) and become more circular. The studied BMI's were used as inspiration when the researchers formulated a value proposition hypothesis to the CBM. Each studied business case has been mapped into a BMC and are presented in Appendix F. In table 4.1 below, a short description of each BMI is provided:

Company	Description of business model innovation
<b>Rolls-Royce</b>	<i>Power-by-the-hour</i> is a business model that provides a complete engine and accessory replacement service, which is paid for by the customer on a fixed-cost-per-flying-hour basis (Rolls-royce, 2015)
<b>Philips</b>	<i>Pay-per-lux</i> , is a business model that sell light as a service. Customers pay for the amount of used light-hours, whereas Philips take care of the technology risk and investment, e.g. streetlight installations in Singapore (McKinsey, 2015)
<b>Xerox</b>	<i>Pay-per-use</i> , is a service offering in which Xerox, instead of selling copy equipment lease equipment to their customer and then charge them a per copy fee for copies excess of 2000 (Sundelin, 2009).
<b>Toyota Material Handling (TMH)</b>	Instead of selling forklifts, TMH sell the function of their fork lifts through long-term rental. An agreement between BT and their customer includes financing, service and maintenance (Sundin & Bras, 2005).
<b>Atlas Copco</b>	Through the concept of <i>Contract Air</i> , Atlas Copco sells functions, in terms of cubic meter of compressed air/gas to their customers. Customer to Atlas Copco is provided with compressed air/gas according to their own specifications. The package includes equipment, ancillaries, installation, full maintenance, repairs, spare parts and annual audits (Atlas Copco, 2015; Atlas Copco, n.d.).
<b>Hilti</b>	<i>Fleet Management</i> , is a contract management program were Hilti generates revenue through leases/subscriptions. Their customer could for a monthly fee have a full complement of tools, including repair and maintenance (Johnson et al., 2008; Hilti, 2015)

**Table 4.1 External cases of Business Model Innovation**

During the study of external cases, the researchers identified that the focus of companies' value propositions are changed from selling products into providing the functionality of a product. For example, in Philips concept *Pay-per-lux*, the company has moved from selling light in the form of light bulbs into selling light as a service. Or as Rolls Royce when they innovated their BM and changed from selling aerospace engines into selling flight hours, in the concept called *power-by-the-hour*.

As a consequence of changing their value proposition, many of the studied BMIs, including both Philips and Rolls Royce, have the common denominator of embracing a system solution when their value proposition changes. This implies that they offer their customer a total solution, which includes the functionality of the products together with supporting activities.

Based on the principle of selling performance and providing solutions together with inspiration from already successful concepts, a value proposition hypothesis (VPH) was formulated by the researchers. The VPH was obligated to pass through the three part criteria and tested in customer interviews. This process was iterated and resulted in the value proposition formulated below:

***Through functional sales, Scania aims to provide their customer with a total solution that ensures sustainable means of transportation and enables customers to increase their efficiency by focusing on their core business***

### **Three part criteria**

The three part criteria was set up in order to ensure that the VPH would direct Scania towards offering a sustainable transport solutions, selling performance and creating a win-win-win situation. For a more

detailed description of the three part criteria see section 2.2.2 *Empirical data collection*. The sections below will present how the VPH stated above passed through all parts of the three part criteria.

### **Sustainable transport solution**

As described in section 2.2.2 *Empirical data collection*, the first part of the three part criteria was to ensure that the VPH and the CBM contribute to create a sustainable transport solution. In table 4.2, the suggested VPH is compared to indicators of a sustainable transport solution, defined in section 3.1.1 Defining Sustainable transportation.

Dimension	Indicator	Direction	System indicators
<b>Economic</b>			
	Economic efficiency	More is better	Providing a total solution aims to increase companies economic efficiency by offer better resource utilization and by enabling <b>customer</b> to in a greater extent focus on their core business.
	Load factors for freight transport	More is better	A total solution will enable a better planning of transports and hence increase the possibility to synchronize joint cargo.
	Vehicle fleet composition	Balanced is better	A total solution will enable better opportunities to control and balance the composition of customers' vehicle fleets.
	Capacity per transport unit (CPTU)	More is better	Through a total solution, the system can be optimized and goods can for example be transported as joint cargo in a greater extent.
<b>Social</b>			
	Road Utilization Index (RUI)	Balanced is better	Through a total solution, the system optimization can enable a more balanced utilization of the road infrastructure can be reached resulting in a <b>societal</b> gain.
	Emissions rates per tonne-km (tkm)	Less is better	A total solution aims to improve resource utilization, which decreases the overall emission rates per tonne-km, which will have a positive impact on health and pollution.
<b>Environment</b>			
	Load factors for freight transport	More is better	The joint cargo opportunities enabled through the total solution presents opportunities for a better utilization of the transportation infrastructure on a <b>societal</b> level.
	Vehicle fleet composition	Balanced is better	Through the total solution offering, a fleet composed to fit the demands of the <b>customer</b> can improve utilization efficiency.
	Emissions rates per tonne-km (tkm)	Less is better	By enabling higher load factors and an increased utilization of capacity, the total solution will decrease the overall emission rates per tonne-km.
	Fossil fuel consumption	Less is better	Better utilization of the rolling fleet of vehicles will impact the fossil fuel consumption in a positive manner.
	Overall energy efficiency	More is better	A total solution offering generates incentives and opportunities for both the <b>company</b> and the <b>customer</b> to decrease the energy utilization.

**Table 4.2 VPH and Indicators of sustainable transportation**

### ***Selling performance***

As stated by the initial part of the VPH, the aim of the VPH is to offer functional sales to its customers. According to Stahel (1998), functional sales are a way in which a company can sell performance. The idea behind the VPH is that the incentives and key performance indicators (KPI) measuring success should change and decouple economic prosperity from resource consumption. Hence, the VPH will by all means create a BM that focuses on selling performance.

### ***Creating a win-win-win***

**Company benefits (Truck manufacturer)** – moving into a CBM and embracing the proposed value proposition would enable new ways for companies to create revenue. As identified in the study of external BMs, when a company offers total solutions it most often also mean that their presence in the value chain increases by moving downstream in the value chain. Taking bigger part in the value chain in most cases also generate opportunities to new revenue streams, which definitely is a win-situation to a company.

**Customer benefits (Haulier)** – the customer benefits of a performance-based value proposition consists in principle of providing the customer with less concern to worry about. The aspects of customer benefits used by Atlas Copco (2015) when describing their service-based BM *Contract Air*, has been used as inspiration to describe the customer benefits of the VPH.

- **No investments needed** – the customer only have operational costs
- **Truck costs matches consumption** – the customer only pay for the functionality consumed
- **Zero worries** – Uptime of the truck is contractually guaranteed
- **Transparent truck costs** – No unexpected breakdown costs and stock of spare parts
- **Flexibility** – flexible contract duration, possibility to match capacity and demand

**Societal benefits** – one of the fundamental ideas with the proposed value proposition is that, resources (vehicles) active in the transport system can be utilized in a more efficient way. This implies that fewer new vehicles would have to be produced in order to meet the transport demand. If fewer vehicles are being produced it also leads to a decrease in used resources. Furthermore, if the transport system could use resources more efficiently it could have a significant effect on environmental aspects, such as emission rates. Taken together, a CBM working according to the proposed value proposition would create a win-situation for society.

### **4.2.2 Customer Interviews**

The customer interviews provided the researchers with fairly disparate answers. During the interviews a number of arguments to why or why not a total solution offering would be interesting were explained. For example, one interviewee saw the trading of trucks as a source for competitive advantage and hence believed that the performance based total solution would affect the competitiveness negatively. However, some interviewees were on the contrary very positive to the concept and were very interested in how this could be implemented. Some of the interviewees considered the activities connected to owning a truck, e.g. service and maintenance, as non-value adding and hence being something that they gladly would outsource. Although not all interviewees were completely positive, there seem to be an interest in the concept of selling a total solution.

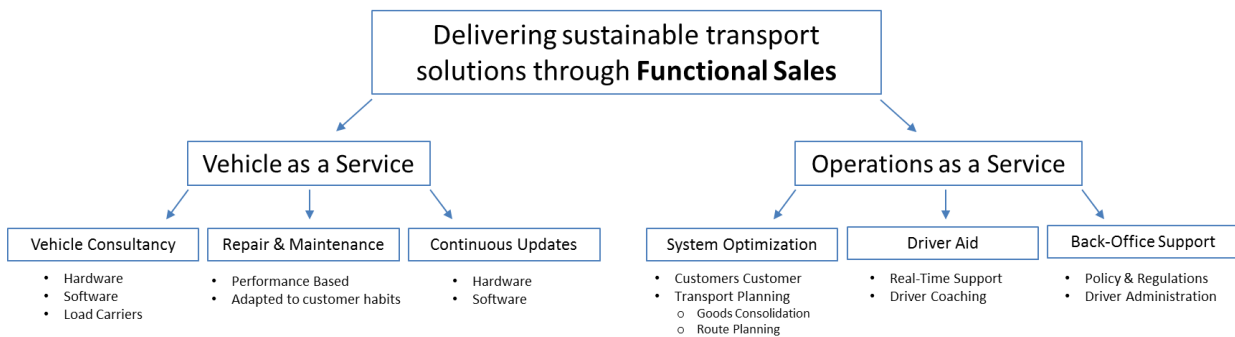
One of the common answers concerning the total solution was that the interviewees believed that such a model would become too expensive. Associated to this skepticism regarding the price is the idea that Scania would charge the customers for more than what was delivered. This was explained by one interviewee as just being a new way to charge the customers even more. Hence, there is a trust issue towards Scania. In summary, the common opinion among the interviewed customers was that it is an interesting idea but that it will be too expensive.



### 4.2.3 Value proposition canvas workshop

Based on the VPH presented above, a VPC-workshop was held with the aim of defining a PSO to the CBM. During the workshop, the workshop participants were asked to brainstorm and list products and services that could satisfy the requirements of two pre-defined customer profiles, one representing the customer segment of Distribution and the other representing Long-Haulage. The customer profiles are more thoroughly described in Appendix E

As mentioned in *Conceptualizing a Circular Business Model* in section 2.2.2 *Empirical data collection*, the original idea was that the VPC-workshop should have resulted in two value maps, one aiming at the customer segment of Distribution and one towards Long Haulage. However, the two PSOs turned out to have many common denominators. Therefore, the researchers decided to compile both value maps into one PSO that is able to satisfy the basic needs of both customer profiles. The compiled PSO of the CBM will, as illustrated in figure 4.6, offer functional sales by delivering vehicle as a service and operation as a service.



**Figure 4.6 Proposed Product and Service offer to the CBM**

As described in section 4.2.1 *Value proposition Hypothesis*, the VPH of the CBM aims to deliver sustainable transport through functional sales. The basic principles of this concept certainly affect the content of the PSO. Below, some aspects that are fundamental to have in mind when reading about the PSO are listed:

- Trucks will be sold as a function rather than a product
- No change in ownership, i.e. Scania will be property owner throughout the whole lifecycle of a truck
- The PSO require vehicles that are 100% connected, i.e. that the vehicles are able to communicate in real-time

As a result from the VPC-workshop, functional sales were broken down into delivering *vehicle as a service* and delivering *operations as a service*. Delivering vehicles as a service refers to optimizing the vehicle to fit a customer’s functional requirements, whereas operations as a service focus on increasing the customers’ operational performance. Worth mentioning is that functional sales aims to optimize the customers performance from a system perspective. As illustrated in figure 4.6, both vehicle and operations as a service have been broken down into suggestions of underlying products and services.

#### **Vehicle as a service**

Vehicle as a service is broken down into; *vehicle consultancy*, *repair & maintenance* and *continuous updates*. In the category *vehicle consultancy* the truck manufacturer (TM) should, as suggested by a Product Manager during the workshop, Scania should embrace the role as a consultant and assist the customer in compiling the best-suited fleet of trucks. Based on a customer’s functional requirement the

TM matches hardware, software and load carriers. From a system perspective this means that the TM would take responsibility of optimizing the customer performance by matching engine size and cab type, with a suitable driveline control system and combining this with a suitable load carrier. As the TM most likely is experts in how their products work and should be used, the service *vehicle consultancy* aims to enhance the efficiency of the customer's fleet of trucks.

The idea behind *Repair & maintenance* is that all services connected to repair or maintenance of a vehicle should have contracts that are based on performance and individually adopted to the customer's habits. A service contract that is based on performance were argued by the workshop participants to be beneficial, since it creates incentives that aim to keep the total cost of service as low as possible, both to customer and service provider. The idea is that customer and truck manufacturer should work together to keep costs at a low level and the better they perform the more they will gain. In the CBM money is generated to both TM and haulier when the truck is up and running. In other words, up-time generates money to both parties. From a system perspective, a part of keeping the service cost at the lowest level possible is ensuring that services are performed when they interfere the least with the customers daily operations. Therefore, it is of high importance that repair and maintenance are adapted to the customer's operational habits.

*Continuous updates of hardware and software* are the last category in vehicle as a service. As mentioned above, the ownership of the trucks is in the CBM retained by a TM throughout the whole lifecycle. As argued by a Senior Manager during the workshop, this will ease the process of continuously equip trucks with the soft- and hardware updates which will enhance customer operations. Furthermore, the fact that contracts will be based on performance makes it interesting from a system perspective to both customer and TM that trucks are equipped with the latest and most efficient updates.

### ***Operation as a service***

The concept of *Operations as a Service* is divided into; *System Optimization*, *Driver Aid* and *Back Office Support*. In the category *System Optimization*, the intentions are that the TM through its CBM should offer services that from a system perspective optimize their customers operations. As suggested by a Product Manager from Scania's sales and marketing department, this could include taking a step further in the value chain and include the transport buyers. For example, a TM could advise transport buyers in how to procure sustainable transport services, which most likely would enhance the hauliers to offer sustainable alternatives. System optimization could also be that a TM provides an IT-system that assists hauliers in their transport planning, e.g. how, when and where to consolidate goods or assist in route planning. To not compete with their own client's interests, the initial focus could be aimed at assisting in configuring how trucks and load carriers from a system perspective can be used in the best and most efficient way possible.

As mentioned above, one prerequisite for the CBM is that all trucks within the system are 100% connected, capable of sending and receiving IT around the clock. In the context of delivering operations as a service, connected trucks opens up new possibilities in terms of driver aid. Trucks that are constantly connected enable the opportunity for real-time support. In combination with driver coaching, a CBM enables the TM to actively coach its customer to make the right decisions and increase their operational efficiency.

As mentioned in section 2.5.2 *Product Service-systems*, moving towards functional sales most often result in a BM that has to incorporate system thinking. In the context of system thinking, this could mean that the TM broadens its presence in the value chain. Examples of such actions are presented in figure 4.6, where the TM could provide *Back-Office Support* to its customers. Since the customers are paying for a total solution, it is of interest to the TM to include as many requested services as possible.

As a result from the VPC-workshop, Back-Office Support could tentatively comprise of the TM assisting its customers in policy and regulation matters or incorporating driver administration into the service.

#### **4.2.4 The Circular Business Model**

The inspiration from external BMIs, findings from interviews and workshop were compiled into a CBM that was mapped in a BMC, see figure 4.11 in section 4.2.4 *Overview of the Circular Business Model*. This section of thesis aims to describe the CBM more thoroughly by using the nine building blocks of the BMC.

##### **Customer Segments**

The proposed CBM was aimed at addressing the two largest (in terms of volume produced) current customer segments; long haulage and distribution. As mentioned in section 2.2.2 *Empirical data collection*, in prior to the VPC-workshop the researchers set up two customer profiles.

During the VPC-workshop it was suggested that in a CBM that sells functionality, the customers should be segmented based on the function they require rather than the type of transportation performed. This was an idea that was supported by the VPC-workshop participants and also by the researchers. The customer segments are already today to some extent described based on the functionality required but the segments are named according to the type of transportation performed.

##### **Value Proposition**

As stated in section 4.2.1 *Value Proposition Hypothesis*, the value proposition for the CBM have been iteratively formulated and is stated as follows:

***Through functional sales, Scania aims to provide their customer with a total solution that ensures sustainable means of transportation and enables customers to increase their efficiency by focusing on their core business***

The value proposition aims to fulfill customers' functional requirements by delivering total solutions. By studying external BMIs, the researchers identified that as a consequence of innovating a BM into selling functionality or performance instead of products, many companies have to retain property ownership of their products. Some illustrative examples are listed below:

**Xerox** – were the customers pay for the number of copies instead of buying their own copier. Xerox remains property owner and ensures that the copier delivers the promised functionality.

**Atlas Copco** – instead of buying and owning the equipment to compress air or gases, Atlas Copco's customers pay for cubic-meters of compressed air and Atlas Copco is property-owner of the equipment.

**Hilti** – instead of selling tools to professional contractors, the contractors can lease the tools they need from Hilti and Hilti remains property owner during the leasing period.

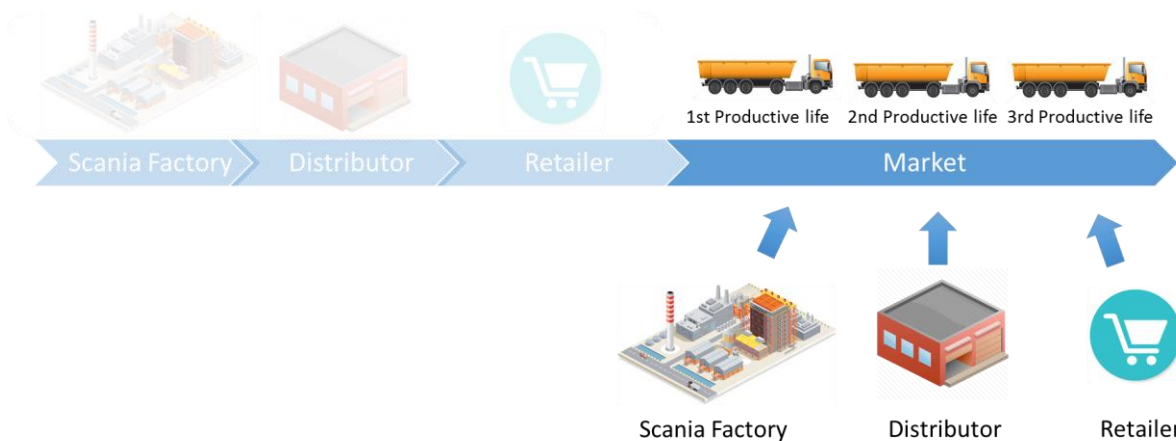
Thus, with inspiration from the above described cases and as suggested by the workshop participants, the CBM would benefit from Scania retaining ownership of the trucks.

##### **Channels**

In the CBM, retailers and workshops will still be the contact-interface where Scania provide their customers with trucks and services. This network will be used as the sales and distribution network. However it will no longer be driven by volume of products. As identified by the Rolls Royce case, see table 4.1 the company increased their revenue when they found a way of leveraging on one product for a longer time, instead of selling new products. In the CBM, the incentives that drive distribution and sales channels have to be connected to the customers' usage of products and services.

In the CBM it becomes utterly important that a system perspective is incorporated at all time. If local dealers or distributors start to sub-optimize their local market the system would not reach its full potential. Therefore, a centralized communication system with centralized offers is needed. However, this does not mean that distributors and dealers should stop communicating with their customers. Rather the opposite, trust and collaboration with customers will be a very important part of the CBM. This is more elaborated on in the next section, *Customer Relationships*.

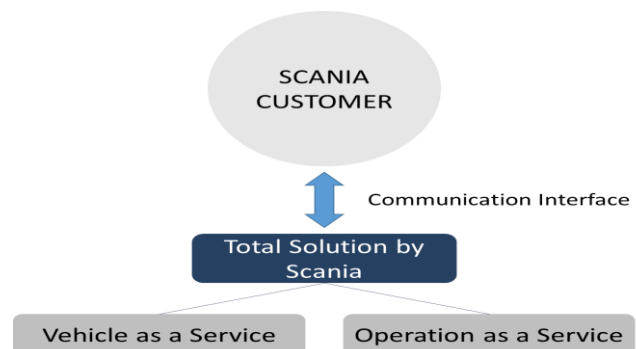
Sales and distribution channels as well as communication channels imply that there is nothing called end-customer or aftermarket in the CBM. Instead, product and services has to be provided to the customer in jointly forces, which is illustrated in figure 4.7.



**Figure 4.7 Sales and distribution channels in the CBM**

### **Customer Relationships**

One aspect of the CBM that is intended to significantly ease the working life of hauliers is that the CBM will offer them with a total solution, i.e. one stop shop, that solves all their transport related requirements. As illustrated in figure 4.8, the customers will have one communication-interface through which they communicate with Scania.



**Figure 4.8 Communication set up in the CBM**

As described in the section above, trust and close collaboration between customers and company are extremely important factors of the CBM. It was indicated by the studied BMIs that performance sales and solution offering is dependent on a closer relationship with the customers. The fact that solutions are being tailored to fit a customer’s specific functional requirement means that the company has to understand the customer’s situation well. Furthermore, since the customer in the CBM is buying a function over time, Scania has to be in contact with the customer and create value throughout the whole period. This implies that the value creation is more dependent on a close relationship between Scania and their customers. In the CBM value is created through collaboration between customer and company. Therefore, the customer relationships in the CBM are described as relational. The example of Philips’ “Light as a service”-concept supports the ideas of a closer relationship. Philips co-creates value with similar companies of like mind and also tailor the solutions to each customer (Philips, 2014), hence creating a closer relationship to both partners and customers.

### **Revenue Streams**

As identified when the researchers studied external BMIs, revenues are often generated based on a monthly fee or correlated to actual usage. Some examples are listed below:

- **Xerox** – pay per copy
- **Atlas Copco** – pay per cubic meter
- **Philips** – pay per lux
- **Hilti** – monthly payments
- **Rolls Royce** – power by the hour

With inspiration from the external BMIs, the payment method in the CBM will be based on utilization-connected billing, e.g. monthly fee, pay-per-use, pay-per-km or pay-per-tone-km.

### **Key Resources**

Based on the PSO that was suggested during the VPC-workshop together with information and inspiration from studies of external and internal databases and business cases, the researchers have defined *Key Resources* of the CBM.

**Modular System:** The modular system is currently giving Scania a competitive advantage and it will probably become even more important in the CBM. As stated by a Senior Manager during the VPC-workshop, “In order to tailor solutions, the modular system has to include both hardware and software”. A modular system will enable Scania to cater the needs and demands of many different customers through a combination of the bits and pieces available in the PSO. The modular system will also play an important role in being capable and efficient when providing continuous updates of hardware and software. Continuously update hardware and software can significantly extend a products lifecycle, which has been proven by Toyota Material Handling in their BMI of leasing out forklifts instead of selling them.

**Connected vehicles:** As stated in the recent annual report, “*Connected vehicles are part of the next wave of innovation*” (Scania AB, 2015a, p.15). Connected vehicles will be one of the most crucial aspects in enabling the system perspective of the CBM and hence be very important in offering the total solution. For example, services enhancing the driving performance, such as real time assistance and monitoring are dependent on connected vehicles. Also, continuous software updates can with the help of connected vehicles be performed regardless of where the vehicle is situated.

**Big Data:** The possibility to have sensors enabling more surveillance of the performance and condition of both the vehicle and how it is utilized creates opportunities to tailor the offering even more to the customers. Many of the services connected to a total solution will rely on information concerning vehicle condition and driver performance. In order to address the efficiency of the customers’ data can provide information of where these improvements can be done. This information will be harvested from the data retrieved from the vehicles. As suggested in some of the external BMIs, large amounts of data are a very important resource in enabling the BMs. For example, in Rolls-Royce’s BM, they are dependent on being capable of constantly harvesting the operating data on order to monitor the condition of the products.

**Know-How:** In the CBM, Know-How must, as explained during a meeting with a Senior Manager at Scania, incorporate a close connection between technical knowledge and knowledge about customers’ wants and needs. This was described as the fact that the original customers’ wants and needs must have a direct feedback-flow into the Scania Factory, where the technical knowledge is located. This process is illustrated in figure 4.9.

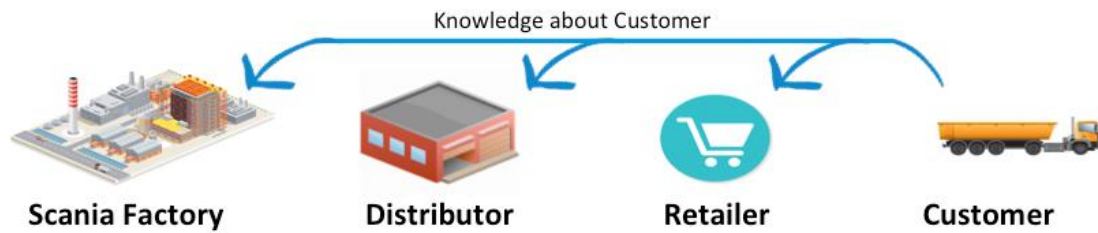


Figure 4.9 Feedback about customers in the CBM

In addition, Know-How in the CBM must also include the ability to use the technical knowledge and knowledge about customers' wants and needs from a system perspective. As stated in the recent annual report, "a holistic view of logistic flow is required" (Scania AB, 2015a, p.16). Furthermore, know-how also includes having the capability to assist hauliers in tailoring suitable solutions. In many cases the hauliers are not capable to articulate what they actually need. This is where Scania should step in and provide them with know-how and expertise, and suggest a solution offer.

**Production facilities:** In order to offer a lucrative CBM, the total solution that is offered by the Scania needs to offer products and services of high quality. Therefore, production facilities that are capable of producing high quality hardware and software are considered key resources. Furthermore, since a CBM also implies that remanufacturing, reuse and refurbishment should be naturally included, new demands are put on the TMs productions facilities.

#### Key Activities

Based on the value proposition, the PSO and also the key resources four key activities were identified; *Risk Management, Organizational KPIs, Data Analytics and Managing relationships.*

**Risk Management:** The CBM will through the performance sales concept incur more risk to Scania. By offering a total solution, risk and costs that previously burdened the customers will be internalized (Stahel, 2010). Also, retaining the ownership of the vehicles exposes Scania to additional risk. Risk management will be a crucial activity in order to mitigate risk and to leverage risk to create optimal business opportunities.

**Organizational KPIs:** The CBM requires embracing a system perspective. During the VPC-workshop it was pointed out that in order to make this system perspective and CBM work, organizational KPIs become extremely important. The organization has to change from measuring each department separately to aligning the organization and measure success on equal terms.

**Data Analytics:** In the case of Rolls-Royce and the power by the hour concept, there is a dependency on a well-functioning data analytics allowing Rolls-Royce to monitor products in real time and predict the need for service. Many of the services offered in the CBM are also dependent on good data analytics. Transforming the gathered data into useful and correct information is highly important for the resources in form of data to be of any value. Data that is analyzed smart enables Scania to better understand how the vehicles are utilized and also to plan and predict the need for repairs and maintenance. Data analytics is hence key to deliver the total solution.

**Managing relationships:** As described above, the CBM incorporates Scania providing their customer with functional sales by offering them total solutions, which also means that the relationship between Scania and their customer will be even more important. Managing these relationships are therefore seen as a key activity within the CBM.

### Key Partners

As suggested throughout the description of the CBM, it is heavily dependent on understanding its customers and embracing a system perspective. Therefore, a holistic view is important in order to optimize all aspects of the value chain. The holistic view is illustrated by figure 4.10, and as stated in the recent annual report, Scania has to include both “transport companies – and their customers – buyers of transport services” (Scania AB, 2015a, p.13). Trying to improve efficiencies along the whole value chain implies that Scania needs to understand the transport buyers and the demands that they have on the transport

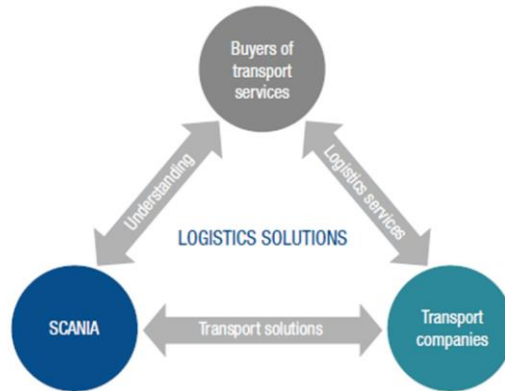


Figure 4.3 Actors in the logistics value chain

Source: Scania AB (2015a)

companies. Improving the holistic system also implies that Scania has to understand and work closely with those setting rules and legislations for the logistic system. Therefore, incorporating customers' customers and governmental institutions as key partners is considered as important.

Furthermore, trying to optimize the transport system across the whole value chain also implies that Scania has to embrace collaborations with competitive brands. The collaboration between TMs were during interviews with external customers argued to be one important aspect in the step if the CBM was to penetrate the market. It is through these collaborations that market standards can be set and the system can reach a new level of efficiency.

### Cost Structure

Cost items that are directly connected to a product or service will of course still exist. However, since the system approach is the backbone of the CBM, cost items that are connected to setting up and maintaining a system approach to the logistic system will be considered major parts of the cost structure. Also, in order for Scania to tailor solutions and adopt a PSO according to specific customer requirements, Scania will need increased processing resources. The process of tailoring solutions will require close and personal collaboration between Scania and their customers. As a consequence of moving into performance sales, many cost items will be internalized. For example, spare parts that in a linear BM is seen as an opportunity to earn extra money will in the CBM be considered as a cost item.

The fact that Scania will remain property owner to the trucks in a CBM also implies that Scania will employ a lot of capital. During both internal and external interviews as well as during the VPC-workshop, ownership of the truck fleet has been advocated as the aspect that will most likely be the biggest cost item in a CBM. As a consequence of Scania internalizing costs and retaining ownership of vehicles, the costs will go up.

#### 4.2.4 Overview of the Circular Business Model

The description of the CBM presented above has been compiled into a BMC. In figure 4.11, the suggested CBM is visualized in a BMC. This is done to give the reader of this thesis an overview of the important aspects of the CBM.

This part of the thesis will also provide the reader with an answer to the second research question:

*RQ2 - How could a performance based circular business model look like at Scania?*

### The business model Canvas

Circular BM

2015-04-29

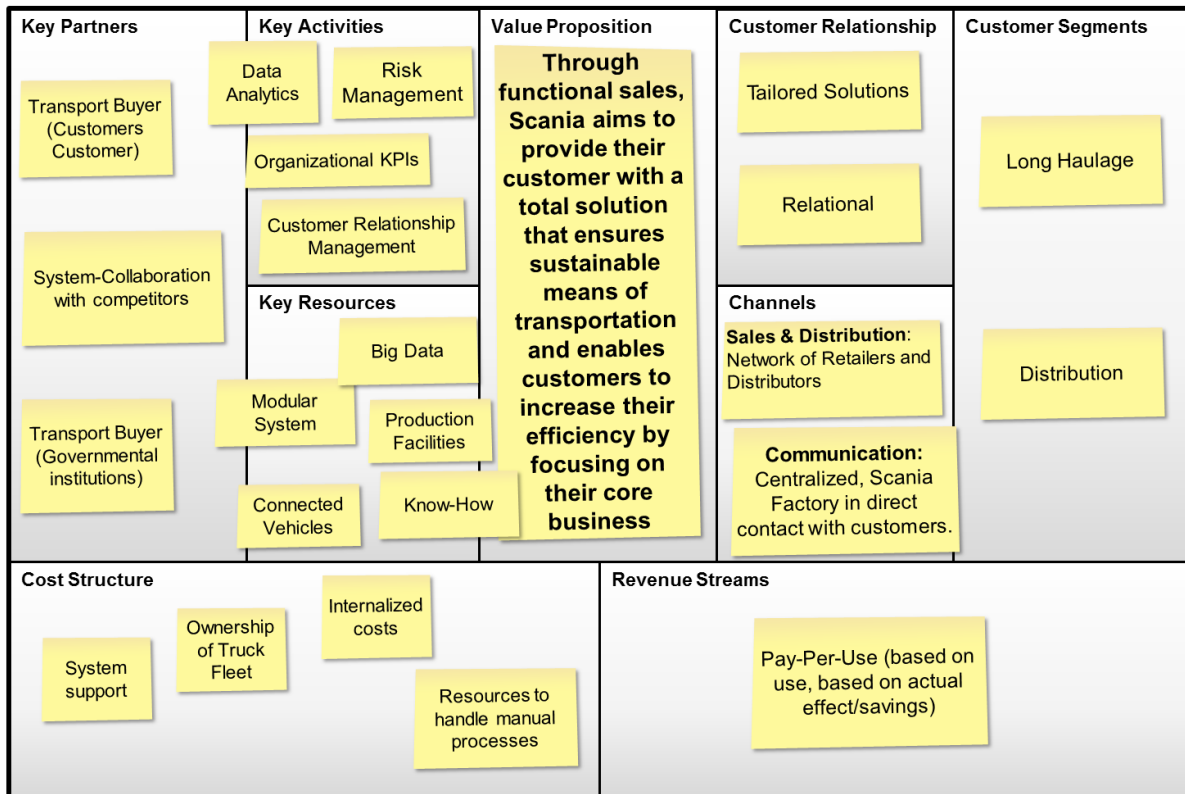


Figure 4.11 Overview picture of the CBM



## 5. Analysis

This chapter will present the differences between the current business model (BM) and the circular business model (CBM). From these differences, important capabilities and competences that Scania must develop are expanded. Also, barriers towards the CBM are presented.

### 5.1 GAP-analysis

In the GAP-analysis presented below, the differences between the current BM and the CBM are presented. The two BMs were compared block by block. The GAP-analysis is as depicted by figure 5.1 a process used to identify the differences between two entities, in this case two BMs.



Figure 5.1 GAP-analysis

#### **Customer Segment**

In the CBM customer segments will be grouped based on new aspects. In the current BM, customer segments are divided based on the type of transportation performed, e.g. Distribution, Long-haulage, Construction or Special-purpose trucks. In the CBM, customers will instead be divided based on the functionality desired from the Scania.

#### **Value Proposition**

As described throughout the thesis and more thoroughly described in the empirical study, the value proposition in the CBM has a different focus from that of Scania's current BM. The focus of the value proposition shifts towards offering value in a way that is tailored to a specific customer's requirements or situation. Hence, the process of defining value will also change. In the linear BM, the company alone can define value. However, in the CBM, value has to be generated through collaboration between company and customer.

The fact that the value proposition will change from selling products into selling performance or functionality will affect how customer are perceived. In the current BM, customers are seen as buyers, but in the CBM customers will become users.

#### **Channels**

As described in the empirical study, the distribution and sales channel in Scania's current BM is following a linear approach. The distribution channel is illustrated with a process where actors try to push products downstream, see figure 4.1. The incentive in this approach is that increased volumes are desirable since it increases revenue streams.

In difference to the current BM, the CBM will not incorporate the approach of an end customers acting in something called aftermarket. As described above, customer demands will in the CBM be based on functional requirements instead of being based on product requirements. Providing solutions to these functional requirements will require Scania to be present during the whole utilization part of the value chain. Products and services have to be provided to the market on a continuous basis. As illustrated in figure 4.7, the Scania Factory, Distributors and Retailers will in the CBM work as a unified actor, providing a system service throughout many life cycles of the truck.

Since the CBM is centered on providing a system perspective in its product and service offer (PSO), changes in the communication channels are a necessity. As identified during the value proposition canvas-workshop (VPC-workshop), the communication between Scania and its customer would benefit from a centralized communication offer. Customers will then meet one Scania and also more or less the same Scania everywhere. Additionally, the CBM allows for knowledge about customers to travel directly into the part of Scania where the products and services are created, see *Key Resources* in section 4.2.3 *The Circular Business Model*. The channels can hence support Scania in the creation and also the monitoring and control of how the customers utilize the services provided by Scania.

### **Customer Relationship**

The customer relationships will in the CBM be more relational compared to the current BM. Both the VPC-workshop and customer interviews gave results that supported the idea of a deeper relationship. As identified during the empirical study, in the current BM where Scania offers products, Scania can more or less create customer value alone. Scania produces a product and the value of that product is released when the customer starts to utilize the product, which can occur at a different time and location. In the CBM, where Scania aims to sell functions and become more service based, customer value is created at the same time as the service is provided. Hence, Scania cannot create customer value on its own, it has to be done in collaboration with the customers. Therefore, Scania has to work closer to the customer and the relationship between them has to be of a relational type.

In the CBM, a tailored solution in combination with the collaborative value creation requires an agile relationship. The relationships will have to, just like the offering, be flexible and adjusted to the everyday circumstances. Additionally, moving to performance sales will demand a better understanding of the function the customers desire and also in which context this function is active. A deeper relationship will require an increased trust from both Scania and the customers, putting a greater demand on customer relationship management.

### **Revenue Streams**

Moving to a CBM will have significant effect on the revenue streams. As proven by the studies of external business model innovations (BMI), the sources of revenue will remain more or less the same, but the flow of revenues will change. Instead of the stuttering flow that is connected to the sales of trucks, the revenues will now be of the protracted and steady type. This in turn will affect the rate at which invested capital is regained and also the degrees to which Scania are exposed to risk.

### **Key Resources**

In the empirical study, Know-How was identified as a key resource in both the current BM and the CBM. However, there will be differences in how Know-How is defined. In the current BM, technical knowledge in combination with customer knowledge is seen as extremely important. This knowledge will still be important in the CBM. However, in the CBM know-how will also include a system understanding. In the CBM, it will become important to see and understand the customer's functional requirements and being capable of finding an applicable solution that is optimized from a system perspective.

As implied by the empirical study, one of Scania's most competitive resources is their modular system. The modular system is extremely important in the current BM and will according to the empirical study be even more important in the CBM. In the current BM, the modular system is used to keep the commonality among ingoing parts at a high level and at the same time create high distinctiveness among the end products. In the CBM, the modular system will in addition enable continuous updates and hence keep functionality of products on a desired level. The modular system will also contribute in tailoring solutions that satisfy customer needs.

The CBM will provide customers with real-time services that are delivered continuously. As a consequence, connected vehicles and the data these can provide are of great importance in the CBM.

The data will as described in *Key Resources* in section 4.2.3 *Circular Business Model* enable Scania to gain deeper knowledge of the customers' behavior in regards to the utilization of the products utilized in delivery of services.

Changing from the current BM into a CBM will also affect the way in which production facilities are considered key resources. An effective and lean production process that is capable of producing quality products will still be important. However, the focus of solely producing new products will increasingly change into remanufacturing and refurbish products so that they can re-enter the circular system.

### **Key Activities**

The biggest difference between the current BM and the CBM is that in the current BM, the key activities revolve around product creation and delivery. In the CBM, the key activities revolve around providing a total-solution. Key activities in the CBM are related to Scania being active within a larger portion of the value chain and the differences this causes.

In difference from the current BM, the CBM will require revised Organizational KPIs. In the current BM, different departments are aligned in separate ways. In the CBM, the departments must work towards a clear and common goal. During the VPC-workshop, this was explained as a need to remove the silos.

Providing customers with total solutions demands Scania to be in close contact with customers. In the current BM, customer preferences are translated into product characteristics and features. The CBM require Scania to monitor these preferences more closely. Also, the value creation in the current BM is enclosed in the product. In the CBM, the value creation occurs in the utilization of the service. Value is hence created in collaboration with the customer, leading to tougher requirements on the customer relationships.

As mentioned in *Key Activities in section 4.2.3*, the CBM will incur a higher amount of risk to Scania. The CBM will introduce new risks to Scania, accompanying the already existing risks. Scania will in the CBM internalize some elements of risk and costs that in the current BM burdens the customers. Also, a retained ownership of the vehicles will increase the amount of capital employed. This will demand Scania to improve risk management activities.

Another big difference induced by the CBM is the demand for connected vehicles and real-time services. Scania needs to have the ability to analyze and convert the data collected into useful information. The information harvested from the collected and analyzed data enables Scania to provide customers with real-time services and also to tailor the total solution based on the actual need of the customers, not the need the customers claim to have. The data analytics will hence play a crucial part in enabling the CBM.

### **Key Partners**

In the linear BM, many of Scania's key partners are closely connected to the design and realization of products. As discovered during the interviews with employees at Scania, suppliers and customers testing products and service are considered as key partners. These partners will still be important in the CBM, however, additional key partners will be those affecting the transport system. Therefore, transport buyers; both in terms of customers' customers and governmental institutions as well as other truck manufacturers (TM) will be considered key partners. The major change in key partners will in other words be more forward integration in the value chain and embracing a system perspective.

### **Cost Structure**

As described in the empirical study, in Scania's current BM a major part of the cost structure is related to the development and production of products and services. The CBM also contains cost items that are related to development and production of products. A major change when moving into the CBM is new cost items as a result of resources being aimed at system maintenance. For example, in the CBM cost items will become internalized and in some cases items that in the current BM are consider as a

revenues stream will become a cost item to Scania, e.g. spare parts. The costs will hence increase both in numbers of cost items and in size. Furthermore, in the CBM Scania will remain property owner of all trucks leading to an increase in the amount of employed capital.

## 5.2 Capabilities and Competences development

The identified gaps in each building block of the business model canvas (BMC) overlap in many areas. In order to create a better overview, four major change-categories were established; *System Thinking*, *Relationships*, *Incentive Structures* and *Economical Aspects*. These categories describe areas in which Scania has to establish new capabilities and competences if they are to move from the current BM into the CBM. Each category is more elaborated on in the sections below and each category is ended with suggested capabilities and competences that have to be incorporated by Scania. This part of the thesis will also provide the reader with an answer to the third research question:

*RQ3 - What are the main differences between the current and the circular business model, translated into capabilities and competences?*

### System Thinking

As stated in the GAP-analysis, moving from the current BM into the CBM means that Scania must embrace system thinking. It will not be sufficient to focus on optimizing the products, instead focus has to be on optimizing all system aspects. Therefore, Scania has to have knowledge about how the whole system works and how products and services contribute and fits into the system. It will also be important for Scania to view the customers from a system perspective. This means that Scania has to have the capability to understand the customer requirements and adopt them to optimize the bigger picture.

In order for Scania to make the system approach work, Scania needs to get all actors of the system, i.e. Scania, transporters and transport buyers, to pull in the same direction. As suggested in the empirical study, centralizing the communications offer would make it easier for Scania to ensure a system approach throughout the organization. However, centralizing the communication could in some cases jeopardize the relationship between Scania and a customer. The personal touch between the Scania salesman and the customer may be hindered if the communication offer becomes too centralized, with too much standardization. Therefore, an important competence that Scania need to incorporate in order to get the CBM functional is a centralized communication offer that caters the system thinking and at the same time caters the so important customer relationships.

In the CBM, the collection of data and the analysis of the same have been highlighted as key to deliver a high quality total solution. The services enabled through a high-performing data collection and efficient data analysis will allow Scania to monitor the products and services more closely. It will also enable Scania to offer real-time services. This in turn will enhance Scania's ability to apply a system-view and hence have the system in mind in the design of the total solutions. The collection and analysis of data will also allow the knowledge about the customers to be directly transferred into the Scania factory directly, as described in *Key Resource* in section 4.2.3 *The Circular Business Model*.

Embracing the CBM implies that, as explained in *section 4.3 Conceptualizing a Circular Business Model*, Scania will be active in a bigger part of the value chain. More presence means that Scania will have to internalize activities, which leads to an increased responsibility. With increased responsibility follows increased risk. Naturally there will be more activities within Scania's operations that risk failing. However, if they are handled well, greater risks often comes with greater opportunities for big returns. Incorporating system thinking hence implies that risk management will become increasingly important in the CBM. Therefore, Scania needs the capability to either neutralize these risks or find a way in which the CBM can cope with the presence of these risks.

### **Capabilities & Competences**

- Understand how to optimize both customer requirements and product features from a system perspective
- Create a communication offer that caters both system thinking and customer relationships
- Data analytics
- Handle risk that are associated with embracing system thinking and increased presence in the value chain

### **Relationship**

Taking the step to selling performance as opposed to selling products will as described above require a deeper relationship between Scania and the customers. Selling performance has as prerequisite that the customers will change from being buyers to being users. This in turn will lead to Scania being in continuous contact with the customers since the value is created and delivered throughout the whole utilization period. The continuous contact creates the necessity for a more agile relationship, enabling the relationship to become more versatile and interchangeable. In order for Scania to nurture the relationship with the customers required by the change, Scania must have a deeper understanding of the customers' working environment and also the needs of the customers. Since the customer needs will be expressed as functions in the CBM, Scania needs the ability to define these functions rather than defining products.

Additionally, the trust between Scania and the customers gain relevance. This trust must be built and nurtured and will require Scania to perform business in a transparent manner. Some aspects of the offering within the CBM require an increased monitoring of the customers, e.g. how the product is utilized and the routes taken. Performing business in a transparent manner will allow the customers to be certain that the price for the total solution is reasonable and matching the value delivered.

As mentioned in the description of the CBM, value will be created in cooperation with the customers. What value to create will also be tailored to the customer's needs. Tailoring an offering to customers will lead to a need for Scania to truly understand the functionality desired by the customers. It might even be so that the customers themselves do not fully understand what they actually need. A prerequisite for Scania to recommend the correct total solution is to truly understand the functionality required by the customers. Sometimes the actual requirement might not correlate with what the customers think they need, hence demanding Scania to truly understand what is actually needed. In order to create this understanding, the system understanding described above is vital.

In order to meet the needs of the customers and also aid the customers in being cost and environmentally efficient, Scania will as described in *Key Partner* in section 4.2.3 *The Circular Business Model* need to acquire partners that affect the system in which the customers to Scania are active. Building relationships with these partners will require new communication paths. In order for Scania to leverage the collaboration with the key partners, Scania must have deep understanding of how the system should be optimized in order to both enable system efficiency and customers' economic efficiency. This in turn requires a deep knowledge of the customers' operations and hence place great demands on a close relationship with the customers.

### **Capabilities & competences**

- Deeply understand the customers' working environment and the needs of the customers'
- Have the ability to make the customers understand what they actually need, not what they think they need.
- Nurture trust towards customers
- Handle communication with multiple actors in the transportation system

## **Incentive Structure**

Changing the characteristic of a value proposition and the way of defining value will surely affect the underlying incentives to all actors in a BM. In this specific case, where Scania changes from being a product provider into a solution provider, the incentive will change from being driven by selling volumes into maintaining a function of product or services as long as possible. For example, the R&D department must be interested in building long-lasting product and designing products and services that naturally include reuse, remanufacturing and recycling. Also, the system of returning loops must be constantly improved and maintained. Furthermore, production facilities have to incorporate a long-term thinking in their way of producing products. Striving for big volumes of newly produced products should not be the incentive that drives the production line. The production should rather use metrics in terms of the number of times an engine can be re-entered in the system.

Changing the incentive structures will also have significant effect on the sales-organization. As today, profit and bonus system are volume-driven. In the CBM these have to change into striving towards keeping a truck operational as long as possible. To make this system work, it is necessary to have KPIs that encourage both sales-personnel and customers to work with long-term contracts that are based on performance. As identified during the empirical study, and identified as a gap between the current BM and the CBM, KPIs have to be change for the whole organization. The entire work force has to believe in the CBM and work according to it. As stated by Pauli et al., (2013), *“a whole system has to be circular or none of it is”*.

## **Capabilities & Competences**

- Understand how to develop, build and maintain long-life products
- Sales organization that encourage long-term performance sales in favor of short-term volume driven contracts
- Organizational commitment and KPIs that are aligned with performance sales

## **Economic Aspects**

In the CBM, revenue streams will be re-defined and configured in a new way. Pay per use or subscription based revenues will lead to the fact that revenues are protracted. The extraction of revenues will naturally lead to the fact that return of investments (ROI) takes longer time (Sonerud, 2014). However, when the system is up and running, investments done on a system level can actually have a faster ROI than today due to a larger customer base. In the initial stage and when individual investments are done (those not covering the entire system), the ROI will most likely be longer in the CBM than in Scania's current BM. This is a fact that has to be accepted by Scania if they would embrace the CBM. Therefore, it is crucial that the organization's financial results are controlled and measured in a long-term perspective. The fact that the revenue streams are protracted does however not mean that the ROI will be lower. If the resources are managed correctly, the CBM can generate higher ROI than the current BM. This is possible since to the retention of resources will allow Scania to base revenues on the same resources over a much longer time period.

Changing the perspective of ROI will also have a significant effect on stakeholders' approach to Scania. As stated by Sonerud (2014), *“there is a lack of familiarity with the phrase circular economy among mainstream investors”*, which implies that there could be difficulties connected to the process of financing the CBM. Therefore, Scania has to embrace a transparency in their stakeholder management and ensure that investors and other stakeholders understand the underlying principles of the CBM. It is important for Scania to clarify the environmental benefits, but even more important to anchor the commercial strengths of the CBM.

The new financial conditions will also affect Scania internally. As mentioned in *Cost Structure* in section 4.2.3 *The Circular Business Model*, the CBM will lead to an internalization of costs. This means that Scania has to incorporate new and more cost items, and in some cases take responsibility for cost items that are the customers' responsibilities in the current BM. To avoid that the internalization exclusively increases cost, Scania must acquire knowledge and capabilities about how to create economies of scale out of these items. For example, as a bigger actor than a single customer, Scania could most likely create economies of scale in different procurement processes.

Another aspect that is connected to the internalization of costs is that Scania as a consequence of embracing the CBM will retain the ownership of trucks. This means that Scania will tie up large amounts of capital. The effect this would have on Scania is more thoroughly discussed in *Economical Barriers* in section 5.3 *Barriers and risks*. Nonetheless, large amount of capital employed is something that has to be handled by Scania if the CBM should work. Therefore, having capabilities and competences of how to handle this situation is a necessity for Scania. Both the internalization of costs and the increased capital employed means that Scania will be exposed to created financial risks.

### **Capabilities & Competences**

- Long-term approach to financial results and stakeholder management
- Handle the internalization of costs
- Find a financial Scania-model that can handle the large amounts of capital employed

### **5.3 Risks and Barriers**

The following section will describe barriers and risks towards the CBM. The barriers and risks are divided into the same four areas as the capabilities and competences, namely *System Thinking*, *Relationships*, *Incentive Structures* and *Economical Aspects*. A lot of changes are required in these categories and by that they are connected to a lot of risks and barriers. This part of the thesis will also provide the reader with an answer to the fourth research question:

*RQ4 - What risks and barriers are there that hinder a switch to a circular business model?*

A general and also one of the most evident barriers to the CBM is that Scania is not in any sort of crisis, and the current BM is generating financial results that are satisfying. The external conditions are still favorable for the current BM and as proven by the interviews with customers, the customers are not disappointed with the current offering. According to Scania AB (2011), Scania has been profitable since 1934, the most recent time red figures were seen in the annual report. Additionally, Scania has a good margin and is gaining market shares. Being as successful as Scania has been and currently is, it may be difficult to motivate the need to change. Although there is constant development of the offering from Scania, stepping too far from the current and very successful BM will require clear reasons and incentives. Also, the current way of doing business has existed within Scania for a very long time, hence making it even more difficult to change the organization.

### **System Thinking**

As stated in *System Thinking* in section 5.2 *GAPs in Capabilities and Competences*, the CBM requires Scania to embrace the capability to understand and think in systems. As stated by Ellen MacArthur Foundation (2013b), system thinking entails a company "to understand how parts influence one another within a whole and relationships of the whole". Hence, before the CBM and its surroundings can work to its full potential and the actors can leverage from the system benefits, there are many aspects that has to be covered. For example, before Scania has developed a system of returning material loops, they need to have trucks in all levels of the system. Practically, this implies that a truck needs to be offered through a performance-based contract to a customer, the customer has to utilize the truck, probably

during a couple of years, before it can enter the returning process of a returning material loop. Then the truck has to go through a refurbish/remanufacturing process before it can be used in the market again. Hence, the running-in period of the CBM would most likely be long. Furthermore, the lack of track record of CBMs means that the concept is in many cases connected to large portion of uncertainty (Sonerud, 2014). A long running-in period in combination with high degree of uncertainties is by the researchers considered a barrier to getting a CBM up and running.

In the CBM it is suggested that Scania should incorporate the approach of performance sales. As mentioned in section xx, the idea of the CBM is that Scania should provide their customers with a total solution. Offering a total solution implies that Scania has to include new activities in their PSO. Including too many activities could lead to Scania being exposed to risks. First of all, Scania may risk losing focus to their core business. As argued by Mont (2002), when including too many new activities there is a risk of over-diversification. Secondly, when conducting forward integration it could be difficult to know how far the company can go without stepping too far. If Scania go too far, they could start to compete with their own customers, which could endanger customer relationships. It could also result in Scania cannibalizing on its own market. Hence, taking the system thinking too far and forward integrate too long can be seen as a risk to the CBM.

The laws and legislations of a country or union can in some cases form barriers towards the implementation of a CBM. For example, certain legislations created to protect consumers through a limitation of the amount of collaboration allowed between companies inhibit some aspects of the CBM. Circular economy relies on deeper relationships throughout the value chain and this could be viewed as cartel formation. Fortunately, some countries are changing the legislation to promote the circular economy. For example, in Sweden retailers within electronics have to accept products for reuse and recycling in equal quantities as the products sold (Braw, 2014). This incentivizes the companies to add this cost to the products and hence making the consumers aware of the process of reusing and recycling.

### **Relationship**

As mentioned in *Relationships* in section 5.2 *Capabilities and Competences*, the customers will in the CBM be users instead of buyers. This implies a completely new way for hauliers to get their needs fulfilled. As a consequence, the mind-set among customers and their acceptance towards new BMs have to radically change. According to Rexfelt & Hjort af Ornäs (2009), performance-based businesses are often associated with package-deals that from a customer view rarely are seen as relevant and just an excuse for companies to charge extra money. This implies that it can be difficult for companies to get their customers to understand the overall picture of the costs related to a total solution. Studies also show that customers are not convinced to embrace ownerless consumption (Mont, 2002).

During interviews with customers, it was clearly expressed that many hauliers are more or less satisfied with the current way of making business. This indicates that customers have a clear and preconceived opinion of how trucks should be purchased. Customers are generally satisfied with the current situation. Changing to performance-based BMs requires Scania to convince their customers to step outside their current comfort zone, which is likely to encounter resistance in many cases. Changing customers' mind-set is often a long process and connected to difficulties (Berglas, 2009 ; Weed, 2012). Therefore it is seen as a barrier towards a successful implementation of the CBM.

### **Incentive Structure**

As described in Channels under section 5.1 *GAP-Analysis*, volumes incentivize the current BM. All actors in the distribution chain are driven by the goal to sell higher quantities, regardless whether it is suppliers, the factory, distributors or retailers. At Scania, the sales force is configured to sell high volumes of products and are incentivized to do so by bonuses and rewards connected to the volumes sold. During the VPC-workshop it was expressed that this traces back into the whole organization and hence



influences the incentives for more than just the sales organization. This incentive structure may create a natural resistance to change due the lack of knowledge of the future stage (Mont, 2002).

As described in *Revenue Streams* in section 5.1 *GAP-analysis*, the revenues in the CBM will be protracted and may hence lead to slower ROIs for potential investors. In many businesses today, including Scania, the owners and investors in the company have an agenda to see a certain level of return on the invested capital. Protracted revenue streams can remove the incentives for investors to finance a venture into the CBM. Also, stakeholders may lack incentives for supporting a transition to the CBM. Uncertainties regarding the CBM and the transition can consequently fail in creating clear incentives as to why stakeholders should support such a transition. Clear incentives to both investors and stakeholders must hence be developed.

### **Economic Aspects**

As argued above, the running-in period of the CBM will most likely be long. Buttinger (2014) argues that the economical perspective also will have long running-in period. Large investments have to be made in the initial phase of a CBM-implementation and due to new revenue streams the ROI will be longer. Hence, the period before a CBM will return any profit is longer than for a linear BM, which can create a certain amount of skepticism towards the concept of CBM. Once again, the fact that many CBMs are at the pilot stage and that a good track record is missing implies that the financial performance of CBMs is not yet measured (Sonerud, 2014). Longer ROI and a non-existing track record create uncertainties about the credibility of CBMs, hence affecting the interest among investors. Low interest from investors will hinder the spreading of CBM and can therefore be seen as a barrier towards the concept.

One of the basic principles in business is for a company to have a balanced level of working capital, in order to keep its liquidity (McCosker, 2000). This implies that from a financial point of view it is desirable to keep the level of assets in terms of tied-up capital limited in comparison to revenue. Since Scania will remain property owner in the CBM, it implies that assets tied up in the ownership of trucks will burden the company's balance sheet. There are examples of companies that have a working BM, where the tied-up capital is high in regard to their revenue. For example, as presented in Hertz Global Holdings Inc. annual report of 2013, the company's fleet of cars tied up capital worth almost 1,7 times the revenue generated from renting out the cars during the same year (Hertz, 2014). Even though Hertz BM proves that it is possible to have a working business and still tie-up a lot of capital in regard to its revenue, the magnitude of tied up capital in Scania's CBM would be many times higher. First of all, a truck is in general more expansive than a car. Secondly, in difference to Hertz, Scania is an original equipment manufacturer (OEM), meaning that their balance sheet is already burdened by tied-up capital, for example in production facilities, testing facilities and R&D-activities. Hence the magnitude of tied-up capital needed to get the CBM working, and the uncertainties and risks connected to this, will constitute a barrier towards implementing the CBM.

### **Magnitude of barriers**

The above described barriers are all important obstacles needed to overcome in order for the CBM to stand a chance. There are most likely more barriers hindering an implementation, however these are the barriers identified in this study and hence also likely to be the biggest in regards to the suggested CBM. Not all of the mentioned barriers are of equal magnitude. The two that are considered the most difficult to overcome, according to the researchers, are the requirement for customers to change from buyers to users and the economic aspects. This does however not mean that the other barriers by any means are insignificant.

The economic aspects are considered key barriers holding the solution to many other barriers. The CBM require an extensive transformation within Scania. This extensive transformation in turn requires a rather impressive investment. The investment has to steer the company towards the CBM in a decisive

way, and this may be hindered by a skepticism concerning the feasibility of the CBM. Also, the CBM will not function properly in a small context. Since the CBM revolves around a system solution, the CBM must be established as such, which in turn requires many activities to be initiated. The researchers argue that if a decision regarding the investment is taken, the remaining internal barriers will and can be handled. A "go-decision" in regards to the CBM will drive the organization towards finding solutions to initiating the activities needed to support and drive the CBM. However, this does not mean that the other barriers will be easily overcome. An extensive transformation will allow for eco-effectiveness instead of eco-efficiency (Braungart et al., 2007). Eco-effectiveness is described as a system that is designed to from start create social, economic and environmental growth opposed to the eco-efficiency approach of trying to optimize an already existing and non-optimal system (Braungart et al., 2007).

The second barrier the researchers believe is highly difficult to overcome is the barrier of customers having to change from being buyers to becoming users. Customer acceptance is critical for the BM to work. It is easily recognized that without customers, there will be no business. The customers' will is something that Scania does not have any power over, as opposed to the barriers connected to internal aspects. Hence, it is the customers that must want to change. The customers' acceptance of the offering from Scania and hence becoming users is connected to other barriers. For example, customers must be aware of the total life-cycle cost in order to fully understand whether or not the offering is priced fair or unfair.

It is the researchers conviction that a concept that has proven itself to be well functioning can overcome many of the barriers. There are a few BM described as circular in the literature, some of which have been taken as examples table 4.1. However, it is not evident how these BMs can be transferred into the context of Scania. Hence an example proving the concept of CBM viable and successful within the OEM-industry would have a positive impact in regards to many barriers. Unfortunately, as described above, launching a pilot-study testing a CBM is not easy and certainly not risk-free.

## 6. Discussion

*The section below provides the reader with a discussion regarding if Scania should go for the circular business model, what Scania need to do and what will happen with the current business model. Finally a discussion about the transferability and trustworthiness of the thesis will be presented.*

### ***Should Scania go for the Circular Business Model?***

The circular business model (CBM) developed in the thesis is not a fully functional business model (BM) that should be outright copied by Scania. It is more of a CBM-blueprint that the company is suggested to have as a target scenario, for many reasons. First of all, the CBM has the potential of generating new revenue streams and also increase the profitability from each truck since resources are reentered into the value chain and can be utilized in multiple life cycles. Secondly, the CBM can be used as a business strategy to make Scania more competitive. The truck industry is getting more commoditized (Dressler & Gleisberg, 2009), hence new ways of selling trucks, such as the CBM, can be a step for Scania to differentiate and stay profitable. Thirdly, since the CBM enables more efficient resources utilization, an implementation of the CBM would make Scania less exposed to fluctuating and increasing resource prices. Finally, a fourth reason to why Scania should embrace the CBM is that it will move Scania towards becoming more sustainable. Given these argumentations, the researchers believe that the CBM could be a lucrative alternative for Scania and a BM that they should have as target image for the future.

### ***What does Scania need to do?***

Before the CBM can become a reality and generate profit back to Scania, the detail level of its content has to increase. As suggested in section 4.2 *Conceptualizing a Circular Business Model*, the CBM value is created in collaboration between Scania and their customers. Therefore, before the CBM can be tested in a proper way Scania has to investigate how Scania together with their customer can create value. What Scania needs to do is to verify, and in some cases also develop, the content of the CBM together with selected customers.

Another aspect that has to be more thoroughly investigated before the CBM can be tested is how Scania should charge their customers, and how the cost structure should be handled. The economic aspects are important since without clarity in how they should be set up and work, the CBM will not become reality. In the thesis, the researchers have suggested different payment models, e.g. subscriptions, pay-per-use. However, the suitability of these models have not been investigated nor tested. Hence, the work of finding a suitable payment model remains. Scania is therefore advised to investigate what payment model that is most appropriate in terms of performance sales and profitability.

One of the major gaps between the current BM and the CBM, and also one of the major barriers towards the implementation of the CBM, is the level of capital that will be tied up if Scania will retain the ownership of trucks. If Scania embraces the CBM, it is a must to consider whether retaining the truck ownership is the best option to offer good performance sales. It is suggested that Scania investigates if it is possible to find an ownership-model that provides the same benefits for sales performance but ties up less capital.

Furthermore, changing from the current BM into the CBM will require a lot from Scania. First and foremost, the organizational mindset has to change. In order for the CBM to work, all parts of Scania's value chain have to believe in a performance-based BM. Increasing the general knowledge about CBM among Scania's employees and customers creates this belief. As today, only a small part the Scania organization knows what a performance-based BM is and how it works. Spreading this knowledge is a must if Scania would like to implement the CBM. When a general knowledge and understanding of CBMs is achieved Scania has to investigate what kind of organizational structure that is suitable. Will the current set up be suitable for a BM that focus on selling performance instead of volume? This has not

been investigated in the thesis and therefore it would be advisable for Scania to verify what kind of organizational structure that creates the right environment and motivators for a CBM.

### ***What happens with the current business model?***

Changing from the current BM into the CBM is a major change for both Scania and their customers. The running in period will most likely be quite long, and will hence require patience from Scania, stakeholders and customers. Initially it could be beneficial for Scania to keep their current BM and use it as a gateway to introduce new products and services. As identified during interviews with customers, there is degree of skepticism towards the CBM. The skepticism is most likely caused by the fact that the customers are unfamiliar to the new concept. This indicates that the market is not fully mature to step into the CBM. It could therefore be smart if Scania keeps the current model until the CBM is fully working. Furthermore, the fact that the current BM is profitable will provide security during the implementation phase.

### ***Trustworthiness***

This thesis was conducted as a qualitative study and major part of the empirical data was collected through interviews. Hence, the data collected is based on the subjective opinion of the interviewees. The researchers have then compiled the data, hence the data may have been affected by the researchers subjectivity. To keep the subjectivity from affecting the results the researchers have crosschecked the findings by gathering opinions from different sources. During interviews the researchers used the same interview template to ensure that all interviewees were given the opportunity to answer the same questions. Furthermore, throughout the thesis the researchers exclusively used the same framework when mapping different BMs. By using the same framework, all BMs are mapped from the same perspective, which has enhanced the trustworthiness of the findings in this thesis.

### ***Transferability***

Throughout the study it has been the researchers intention keep the findings of the thesis as transferable as possible to many business areas and other industries. Parts of the generated CBM are considered to be directly transferable to most part of Scania's business areas and other industries. This also applies to certain capabilities and competences as well as some of the barriers. However, the transferability of the CBM as a whole is considered to be limited. The CBM is constructed for Scania and is therefore mostly based on Scania-specific inputs, making the CBM as a whole tailored to the circumstances at Scania.

Concerning the transferability to other customer segments and other geographical areas within Scania's truck segment, the researchers believe that the established CBM is transferable. Even though the customer interviews were solely conducted with actors from the Swedish market, the detail level of the CBM is deliberately kept on a lower level than possible. Hence, the CBM is not actively adapted to any market-specific requirements and therefore it is possible that the CBM is transferable to other customer segments and markets. However, such applicability has not been investigated.

## 7. Conclusion

*The following chapter will conclude the results by presenting answers to each of the research questions. Suggestions to future research are presented in the end of the chapter.*

### 7.1 Findings

The research conducted during the thesis led the researchers in the attempt to answer the research questions and hence also fulfil the purpose of the thesis. Below are the conclusions to each of the research questions presented.

#### ***RQ1 - How does Scania's current business model look like on a general level?***

The mapping of Scania's current business model led to a general model describing the business rational of Scania Trucks on a generic level. As described in the current business model (see section 4.1 *Scania's Current Business Model*), Scania is currently delivering value by selling products and services. This leads to short term transactional relationships with customers. The value creating activities and resources are centered round the products and services. This is also the case for the partners who are mainly located upstream in the value chain.

#### ***RQ2 - How could a performance based circular business model look like at Scania?***

The circular business model is centered on the performance sales and this requires more long-term customer relationships. The performance sales also affect customer segments, cost structures and revenue streams. The total solution offering affect the key resources, key activities and key partners so that these become more holistic. The total solution demands the application of a system view and hence inevitably forces the business model (BM) to become more holistic. The circular business model created in this thesis is as mentioned earlier on a fairly general level and needs to become more specified before it is completely applicable. However, the circular business model (CBM) is detailed enough for the researchers to evaluate whether or not it is a viable BM for Scania. It can hence also be used to spark an interest within Scania in regards to the concepts CBM and performance sales.

#### ***RQ3 - What are the main differences between the current and the circular business model, translated into capabilities and competences?***

During the comparison of the current BM and the CBM, a number of differences were revealed (see section 5.1 *GAP-analysis*). Some of the differences identified are specific to the CBM, but there are also many of the identified capabilities and competences that would be beneficial to both the current and most likely other possible future BMs. It would hence be possible to start improving the capabilities and competences within current BM as a measure to strengthen the current organization and the current way of making business. This would position Scania favorably in terms of a potential switch to a circular business model.

#### ***RQ4 – What risks and barriers are there that hinder a switch to a circular business model?***

The research revealed a number of barriers and risks connected to a switch to the CBM. Since the transition from a linear BM to a CBM requires substantial changes it is only natural that there are barriers and risks. However, it should be emphasized that the risks and barriers are not big enough to discard the idea of a CBM. A number of barriers, e.g. the financial barriers, are connected on how Scania considers and evaluate the success of the BM. If the approach and the way to assess the company can turn towards a more long-term position, many barriers would disappear.

As just mentioned, there a number of risks and barriers connected to a move to a CBM. These are not in any way mundane, but if they are overcome there are according to literature immense savings to done (Nguyen et al., 2014). During the whole thesis the researchers have gotten the feeling that there is a

strong belief within Scania that the CBM is a good suggestion as to how Scania should perform business in the future. Naturally there is a certain level of skepticism in regards to such an unknown concept, but people within Scania seem motivated and willing to improve the company in economic, social and environmental aspects.

## **7.2 Suggestions to Future Research**

During the literature review, the researchers discovered that there are a number of examples of companies that have moved towards CBMs. However, these BMs differ rather much and it is sometimes somewhat difficult to do the connection back to the circular economy concept. The researchers believe that a common picture of what a CBM should entail would be beneficial for companies striving towards a CBM. Depending on the created definition of what a CBM is, this definition can help steering companies towards CBM that enable a circular system, not only towards CBMs that are exclusively functioning within a company. Hence, a study that to some degree defines what should be considered a CBM would be beneficial.

The barriers discussed in section 5.3 *Risks and Barriers* are not mundane in any way. It however difficult in some cases to describe how tough it would be to overcome these barriers, and also how to overcome some of these barriers. Since the barriers are connected to the skepticism towards a transition into a CBM, a study investigating these barriers more thoroughly and also explore how to overcome these. A suggestion for future research is thus to investigate the barriers towards CBMs and how to overcome these.

One of the barriers crucial to many OEMs is the barrier connected to the tied up capital. As suggested by the CBM described in this thesis, Scania would retain ownership of the vehicles. This would incur massive amounts of tied up capital in addition to the already tied up capital in production facilities. Is it likely that a CBM based on performance sales could be set up using a different payment model, e.g. a deposit-system where the resource recollection is incentivized in order to close the material loops? Hence, limiting the amount of tied up capital.

In the literature regarding circular economy, great potential benefits and savings are highlighted (Lacy et al., 2014; Ellen MacArthur Foundation, 2013a). It is however not described how long it will take to reach these benefits and how long before the companies can start enjoying the savings described. Naturally, these questions are tightly linked to the type of CBM applied and also in which scale. It would nonetheless be beneficial for the research area of CBMs to further investigate the timespan over which the benefits can be reached.

## 8. Recommendations

*The below stated recommendations to Scania are based on the findings during the research. The recommendations below are aimed at creating a good foundation on which to build capabilities and competences necessary for the circular business model (CBM).*

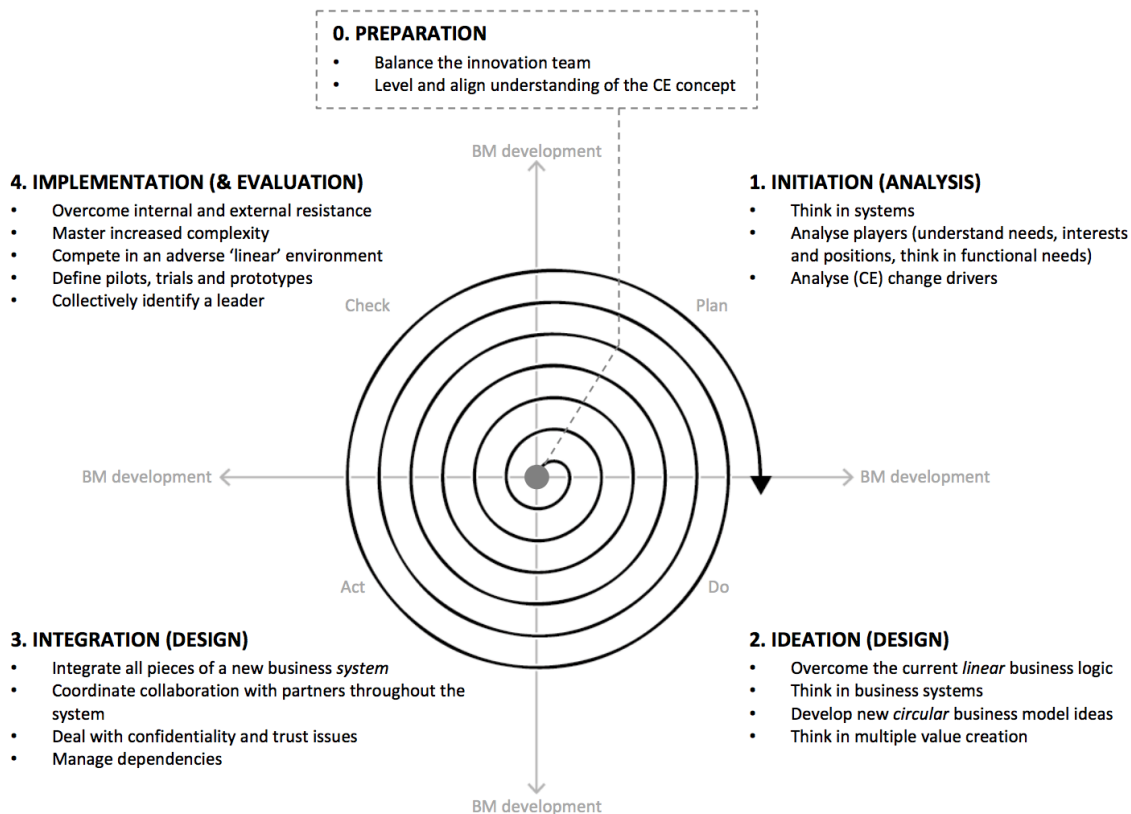
The Research Support Office at Scania initiated this thesis with the aim of investigating CBMs as an approach to create sustainable transport solutions. Some of the capabilities and competences that have been suggested to Scania are not just beneficial for the CBM but also to the current business model (BM). The capabilities and competences that are beneficial to the current BM has greater chance to gain acceptance, since it is possible to demonstrate the potential gains in the current BM and show results from a short-term perspective. Scania is therefore recommended to start investigate how the capabilities and competences beneficial to the current BM can be implemented into the existing organization. For example, by increasing the knowledge about customers and how they actually use Scania's products and services could be very valuable assets in today's product development process. One of the most appealing examples of capabilities and competences that could enhance this process even more is describe in *Key Resources* in section 4.2.3 *The Circular Business Model*, where knowledge about customers are directly fed back into Scania Factory.

In order for Scania to gain even more knowledge about their customers and how they use Scania's products and services, it is recommended to Scania to embrace a system view. It is most likely beneficial, even to the current BM, to incorporate more actors than just the actual customers (hauliers). Collaboration with customers' customers and other system actors can give Scania valuable knowledge. By gaining system knowledge, Scania could embrace the role as transport counselor and in some cases explain to the customer what they actually need and not what they think they need.

As the transport industry becomes more and more digitalized and Big Data gains significance, it is important for Scania to be prepared to join the transition. By having reached more than 100 000 connected vehicles Scania is off to a good start. However, connected vehicles is only the first step. The large fleet of trucks will generate huge amount of data. Data that is inadequate unless Scania has the capabilities and competences of handling the data and turn it into useful information. Therefore, it is recommended to Scania to can build capabilities and competences connected to Big Data and Data Analytics. This would be beneficial to the current BM and it will become a must if Scania would like to operate according to a CBM.

One of the major barriers towards the spreading of CBMs is the lack of general knowledge and consensus about the concept. A prerequisite if Scania would like to use the CBM-approach to sell sustainable transport solutions is that the organisation knows what the concept is all about. Therefore, it is recommended for Scania to create a knowledge dissemination of CBM into the whole Scania organization. Some of Scania's business areas have come a long way towards a CBM, e.g. performance-based contracts used in Scania Mining (Scania AB, 2015e), Scania Rental (Scania AB, 2015f) and Scania Forestry (Scania AB, 2015g). Hence, Scania has much knowledge about performance sales, however it is limited to few peoples and scattered in a very big organization.

The final recommendation concerns the implementation of the CBM. If Scania deems the CBM a viable option, a pilot project evaluating the benefits and barriers is recommended to be the first approach. It is recommended that the pilot project is implemented in a separate circular value chain that is stepwise scaled up, see figure 8.1. The idea is not to implement a full CBM in one step. New activities inspired by the CBM concept should be implemented step-by-step and finally result in a fully functional CBM. A separate value chain will more quickly reveal the benefits and barriers, since there is no time and resources wasted on reforming a linear value chain.



**Figure 8.1 Implementation process for the CBM**

Source: Mentik, (2014)

The implementation plan follows a Plan-Do-Check-Act-approach (Bergman & Klefsjö, 2010). The initial step will be the core of Scania's CBM development. Step 0 consists of preparation of the innovation team and getting them to have an aligned understanding of the CBM. It is recommended that Scania use employees from business areas that has come far in selling performance, e.g. Scania Rental, Scania Mining or Scania Forestry. In Step 1, the implementation team has to analyze the players of the system, understand customers' needs and think in terms of functional sale. In step 2, the system knowledge should be used to overcome the current linear business logic. It is in this step that the design of the CBM should be outlined. In step 3, the CBM should be integrated with the other pieces of the system. Collaboration and dependencies with other players throughout the system, such as customers' customer and competitors is incorporated into the CBM in this phase. It is also at this phase that Scania has to deal with new confidentiality and trust issues. In the final step, step 4, the new circular activities should be implemented and tested. Through the implementation the circular activities will demonstrate the benefits of the system, which an efficient way to overcome both internal and external resistance. When these activities have been evaluated Scania has returned to the step 1 and the process should be repeated. However, this time Scania has to break new ground and increase the extent of the implementation projects. In figure 8.1, this is illustrated by the loop creating a new outer lap, moving further in the BM-development towards a CBM.



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## APPENDIX

Appendix A – Interview template for internal interviews

Appendix B – Interview guide for customer interviews

Appendix C – Interview template for customer interviews

Appendix D – Workshop guide for the VPC-workshop

Appendix E – Customer Profiles

Appendix F – BMC-mapping of external BMIs

## Appendix A

*This appendix presents the template used during internal interviews conducted at Scania.*

**Introduction:** Present the researchers and the research project. Give an explanation to why it is valuable to hold the interview with XX and also what type of questions will be asked.

**Anonymity:** Interviewees will be given the option to be treated anonymously.

If an interviewee has chosen to be anonymous, the data presented in the thesis will not be traceable to the interviewee.

**Ethics:** The interviewees always have the option of not answering a certain question.

The interviewees may end the interview if they see it fit.

No inquiries regarding why a certain question was not answered or why an interview was ended prematurely will be made.

### Questions:

- Can you give a general description of the concept XX and a short background to why it is an important research area?
- What are the benefits?
  - For Scania
  - For the Customer
  - System benefits
- Are there any drawbacks?
- Are there any obstacles
- How does this affect the customers' economy?
- What are the obstacles?
- Have you thought about how this could be sold to customer? (Is there any form of business model?)
- Is XX something that should be available to all motorists or only Scania-vehicles?
- What is the value proposition for XX?
- Which Customer Segments are targeted?



## Appendix B

This appendix contains the interview guide that the researchers used as guidelines during interviews with external customers to Scania.

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**Anonymity:** Interviewees will be given the option to be treated anonymously.

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**Ethics:** The interviewees always have the option of not answering a certain question.

The interviewees may end the interview if they see it fit.

No inquiries regarding why a certain question was not answered or why an interview was ended prematurely will be made.

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### Purpose of the interview

The purpose of conducting interviews with actors within the transport industry is mainly to concretise the PSOings that could be connected to the stated value proposition hypothesis. The PSOing will be used as a foundation in mapping key resources and key activities connected to the enabling of a circular business model.

Furthermore, the customers will be asked to describe their thoughts about current and future Pains and Gains within their business. The findings are aimed to facilitate the determining of the market fit of the proposed value proposition.

### Interview Process

The interviews will be conducted according to the process illustrated in figure Appendix B. The first step is to map the customer's current pains and gains. In the same step, customers will also be asked to describe the thoughts about their future business. As a second step, the value proposition of the circular business model together with its gain creators and pain relievers will be presented to the interviewee. In the third and final step, the interviewee will be asked to give feedback on products and services that they believe should be included in the solution offering.

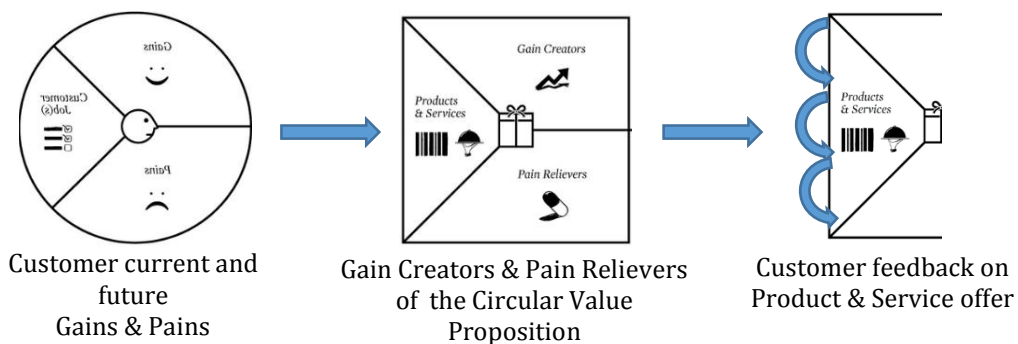


Figure Appendix B, Interview process

### The circular business model

***Provide customer with a total solution that ensures sustainable means of transportation and enables customers to increase their efficiency by focusing on their core business.***

Customers are offered solutions that meets all their wants and needs that are connected to their operation of transporting goods from point A to point B, i.e. customers are buying a solution from a solution provider and will only have one cost item in their accounting. The payment is directly connected to their actual usage of the transport function and paid through for example monthly

subscriptions or pay-per-use systems. The object of the provider is to ensure customer pains are minimised at the same time as their gains are maximized.

In accordance to the Philips case, *Pay-per-lux* (McKinsey, 2015), where their customers demand the function of light and Philips take full responsibility to deliver light to their customers. In the case of providing customers with a transport solution, the customers are requesting the functionality of a transport solution and it is up to the solution provider, like Scania, to make sure that the requested functionality is delivered.

#### **Gain Creators**

- **Increased efficiency in resources utilization** (e.g. lowered total cost, increased up-time)
- **Positive social consequences** (e.g. customers become more sustainable = “green brand”)
- **Fulfilling customer needs** (e.g. guarantee up-time)
- **Enhance customer adopting to new technology** (e.g. electrification, platooning)
- **Synergy effects from central system solution** (e.g. enables technology/resource sharing)

#### **Pain relievers**

- **Increased economic efficiency** (e.g. increased up-time, resource utilisation)
- **Enable full focus on core business** (e.g. facilitate and coordinate customers non-core processes)
- **Reduce risk** (e.g. financial risk of owning equipment and investing in new technology)

## Appendix C

*This appendix present the template with interview questions that the researchers used during interviews with external Scania customers.*

**Introduction:** Present the researchers and the research project. Give an explanation to why it is valuable to hold the interview with XX and also what type of questions will be asked.

**Anonymity:** Interviewees will be given the option to be treated anonymously.

If an interviewee has chosen to be anonymous, the data presented in the thesis will not be traceable to the interviewee.

**Ethics:** The interviewees always have the option of not answering a certain question.

The interviewees may end the interview if they see it fit.

No inquiries regarding why a certain question was not answered or why an interview was ended prematurely will be made.

### Basic description of the business

Information collected prior to the interview.
How much of your business is: (Revenue-wise)
Transports:
Long Haulage:
Distribution:
Warehouse activities:
Administration:
Number of vehicles:
Heavy trucks:

What do you consider being:

- Functional jobs (activities and processes vital for your operations)
  - Core Business:
- Social Jobs (trying to look good, sponsoring, “green brand”, etc.)
- Support functions (activities that support your core business. These activities are not crucial to carrying out the core business).

### Present Time

- In your daily operations, what do you consider ..... you to focus on the core business?

<b>Facilitates</b> (supports, helps in planning etc.):
<b>Inhibits :</b>

- **What in your current business do you consider being a:**

<b>Risk</b> (technical, financial, taxes and regulations):
<b>Possibility</b> (potential to grow, activities that you want to do more):

--

- Do you consider owning a truck being a risk?
- Is it important for you to own new trucks? Would you consider utilizing 15 year old trucks provided that the level of functionality is guaranteed?

- **In your current business, what do you consider being:**

<b>Your biggest competitive advantage</b> (why customers choose you; service, punctuality etc.):
--------------------------------------------------------------------------------------------------

<b>Too costly</b> (time wise; takes time from core business, cost wise):
--------------------------------------------------------------------------

- **In your current relation with your truck providers, what do you consider being:**

- Inexpensive vehicles, Well-functioning total solutions, Good service, High quality

<b>Most value creating</b> (most contributing to perform the core business):
------------------------------------------------------------------------------

<b>Underachieving</b> (takes focus off the core business: administration, service):
-------------------------------------------------------------------------------------

## Future

### (Business sector)

- **What do you believe will be the future risks within the transport/haulage industry?**  
(New fuel taxes, less need for transports, tougher competition)

### (Company)

- **How would you like for your company to evolve in the future?**  
(more focus on Core Business, diversification)
- **What will be the biggest challenge for your company in the future?**
  - According to you, which activities will hamper/inhibit you daily operations in the future?
  - Is there anything in your future business that you believe will become too costly?
- **In which direction in the value chain would you like for your company to move in the future?**  
(Involve customers or suppliers more extensively in your business)
- **Do you believe the positive aspects of your business will be the same in the future?**
  - If not, what and why will it differ?

## Describing the hypothesis

The truck manufacturer will provide you with a total solution concerning the transportation related needs

- **Guaranteed up-time** of vehicles (including functional service)
  - As a customer, you pay for the function.

- Contributes to lifecycle optimization → increased lifespan and utilization of products
- **Create an intelligent transportation system.**
  - A centrally controlled transportation system that enables vehicles regardless of brand allowing vehicles to:
    - Platooning
    - Companion – communication between trucks.
    - Live feedback to drivers
- **Create a more sustainable logistics system.**
  - Increased profitability through flow optimization
  - Route planning
  - Consolidation of cargo
- **Driver**
- **Fuel**

### **Connecting the hypothesis to the a future business model**

- Which products and services will need to be included if the proposed business model was to be realized?  
(Please be creative with your answer and it is more than welcome to "think outside the box")
  - What would be your requirements on Scania?
- Which are the greatest barriers inhibiting you from turning to total solutions?  
For example leasing.  
(too expensive, there is some sort of stability in owning the vehicles, total solutions today are simply not good enough)
- What would increase the probability of you as a company buying a total solution?

### **Closing question**

- What is your impression of our research?

## Appendix D

*This appendix contain the workshop guide that the researchers used as guidelines in prior to and when conducting the VPC-workshop.*

**Anonymity:** Interviewees will be given the option to be treated anonymously.

If an interviewee has chosen to be anonymous, the data presented in the thesis will not be traceable to the interviewee.

**Ethics:** The interviewees always have the option of not answering a certain question.

The interviewees may end the interview if they see it fit.

No inquiries regarding why a certain question was not answered or why an interview was ended prematurely will be made.

---

### **Purpose of the Workshop**

The purpose of the workshop is to get an internal "Scania view" on which products and services that should be included in an offer providing the customer with performance rather than a product. The result of the workshop is important for the thesis due to the different perspectives on the needs of the customers possessed by the participants. The workshop will in addition to the customer-interviews provide the researchers with a deeper understanding of what the product offering, i.e. products and services, connected to the proposed value proposition should include. The outcome of the workshop will together with the customer interviews highlight which key activities and key resources that are needed in the Circular Business Model. The participants will be employees from different positions within the Scania organization in order to create an as creative as possible atmosphere during the workshop. The participants will have expertise within different research-areas and also within different business areas.

### **Workshop Process**

The workshop will be conducted according to the process illustrated in figure Appendix D. In the first step, a predefined customer profile of a future customer is presented to the workshop participants. The customer profile is based on customer interviews performed by the researchers and entails: *customer jobs*, *Pains* and *Gains*, more thoroughly described in the report in section 3.4.2 *Value Proposition Canvas*. In combination to the customer profile a future scenario of the transport industry has been set up. The purpose of setting up a scenario is to create ground rules for how the future business environment will look like.

In the second step, which is the focus area of the workshop, the value proposition-hypothesis is presented and the workshop participants are asked to describe what the specified value proposition should include in terms of products and services. The value map is divided into three areas: product and services, pain relievers and gain creators, more thoroughly described in the report in section 3.4.2 *Value Proposition Canvas*

## Value Proposition Hypothesis

*Provide customer with a total solution that ensures sustainable means of transportation and enables customers to increase their efficiency by focusing on their core business.*

In the third and final step, the workshop participants are asked to describe what key activities and key resources their suggested products and services would require from Scania. The aim is to create a connection to the circular business model.

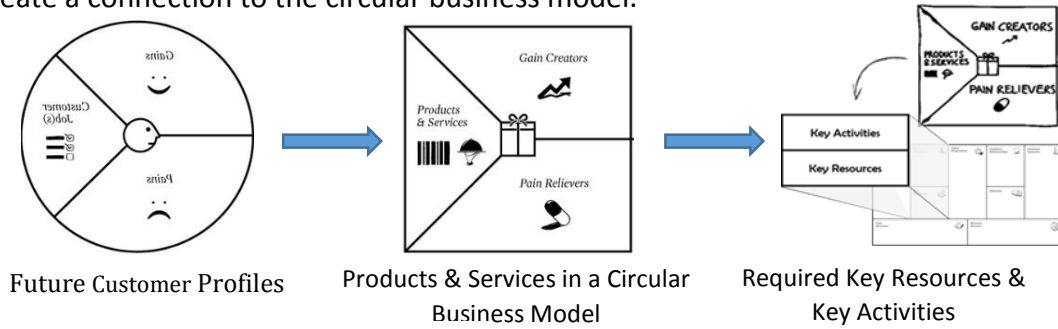


Figure Appendix D, Workshop process

## Appendix E

This appendix presents the customer profiles that were used as part of the VPC-workshop that was conducted during the process of generating a circular business model. Included in the appendix, a future scenario of the transport industry is presented. The aim with the future scenario is to create rules of conduct to which the customer profile have to respond to. Included in the definition of each customer profile is a description of the customers jobs and business. This description is divided into three parts; functional jobs, social jobs and support functions.

Functional jobs are jobs that are required to enable the core business. Social jobs are the jobs that are enhancing the brand, e.g. sponsoring or environmental initiatives. Support functions are jobs that are carried out internally but not required in order to perform the core business, e.g. administrative processes not connected to the core business.

Future scenario of the transportation industry
<ul style="list-style-type: none"><li>• Growing market for sustainable product/services</li><li>• Tougher demands for reduced CO<sub>2</sub> impact from transport industry</li><li>• Transport buyers have increased requirements that carriers should contribute to more sustainable transporters, e.g. Green-brands becomes important</li><li>• Increased demand for adoption to intelligent transport systems</li><li>• Increased need for transport</li><li>• Increased competitions from alternative transport means</li><li>• Punctuality is put in front short transport times</li><li>• High Capacity Transports are allowed on the roads</li><li>• Big cities – Strong Urbanisation</li><li>• Increasing and volatile resource prices</li><li>• Higher commoditization in products and services when delivered separately</li></ul>

### Customer profile (Distribution)

- Medium/Large company based in Stockholm.
- 40-80 vehicles.

**Core business:** Transportation based on pick-up and delivery. Max 80km/h, avg. 30km/h.

- Urban Environment
- Cramped space
- Many starts/stops

### Job and business description

**Functional jobs:** Traffic management, consolidation of cargo,

**Social jobs:** The company strives to be considered as sustainable transporter, green-brand

**Support functions:** Administration of drivers, service agreements,

### Pains

- Traffic congestions
- Low filling rates
- High service costs
- Difficulty to predict costs for services etc.
- Dissimilar/mismatched incentives between transport buyers and distributor.  
(It is not the transport buyer that is the receiver of the goods)



- Dissimilar/mismatched incentives between distributor and truck supplier. (Truck supplier gains revenue when trucks are in service, it causes costs to the Distributor)
- Problematic to find “good” and experienced drivers.
- Careless and negligent drivers induce unnecessary service costs.
- Green transports are not profitable.
- Low efficiency (too much standstill, loading zones are occupied, etc)

## Gains

- Increased flexibility in regards to load capacity
  - Increased effectiveness in transportation system (e.g. Off-Peak)
  - Guaranteed up-time of transport means
  - Easier access to new technology, e.g. less investment risks.
  - Increased resource utilization/sharing
  - Reduced costs for fuel
- 

## Customer profile (Long Haulage)

- Medium sized company (15-30 trucks)
- Sub-contractor that performs transports for a larger distribution company
- On the road 24/7.

**Core business:** Transportation of goods from point A to point B. Max 80km/h, avg. 74km/h.

- Long distance
- Truck + trailer (24m)
- High average speed (mostly highway)

## Job and business description

**Functional jobs:** means of transportation, transport planning

**Social jobs:** The company strives to be considered as sustainable transporter, green-brand

**Support functions:** Administration of drivers

## Pains

- Declining profitability due to high operating costs and unfair competition
- Too many one-way transports, i.e. the return trip from point B to point A is empty
- Difficult to predict total operating expenses, e.g. large fluctuations in service expenses
- Legislations for driving hours impairs opportunities for increased productivity, e.g. regulations are forcing trucks to unwanted standstills that affect productivity. However, a good aspect in terms of safety and health of drivers.
- Administrative processes that take focus away from core business, e.g. administration of drivers, handling service contracts.

## Gains

- Guaranteed up-time of transport means
- Easier access to new technology, e.g. less investment risks.
- Increased filling ratios
- Increased resource utilization/sharing
- Increase in allowed transport capacity, e.g. High Capacity Transports (HCT)

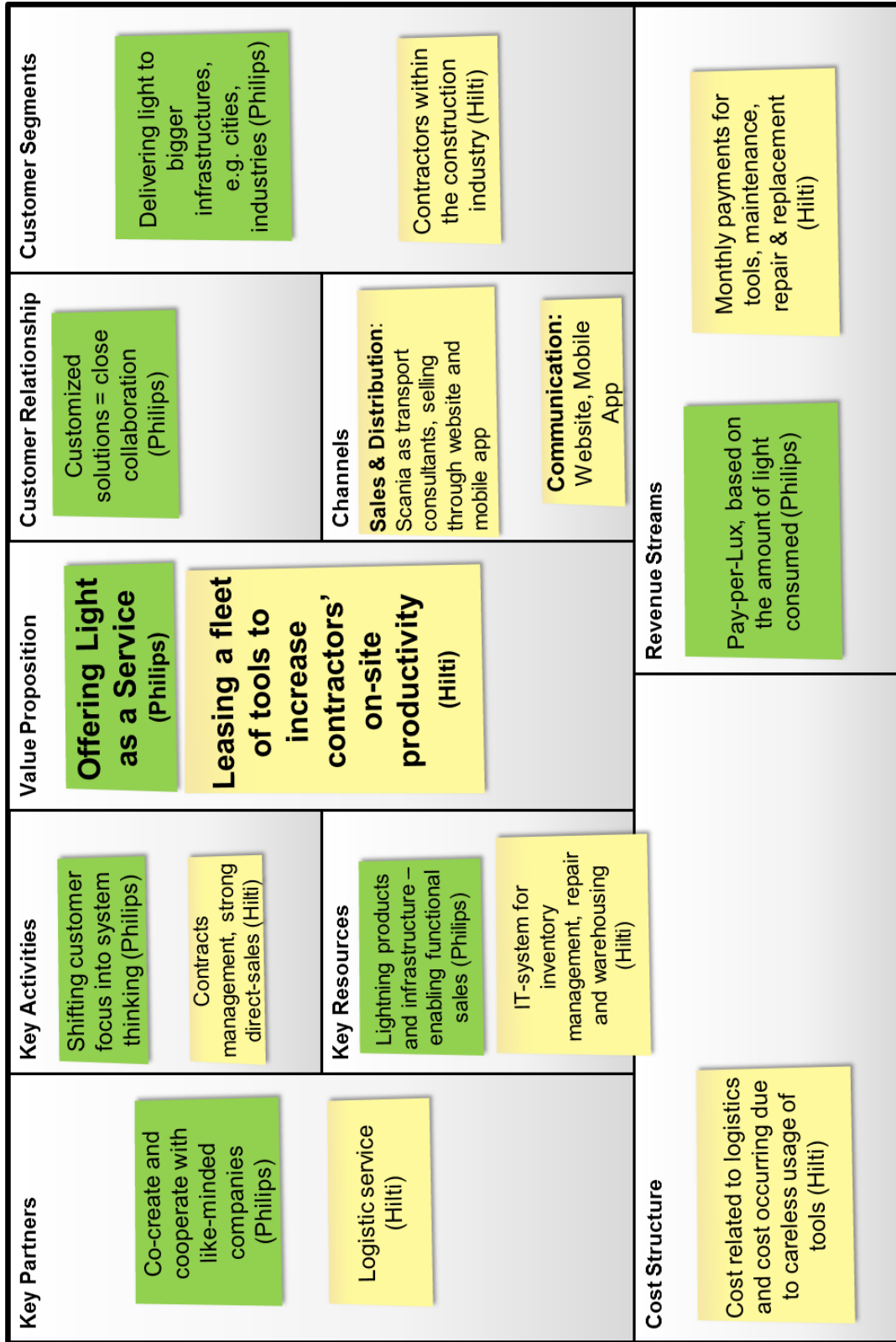
# Appendix F

This appendix presents a mapping of external companies and their BMIs that have been used as inspiration during the thesis. Each BMI is mapped into a BMC-template.

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Hilti & Philips

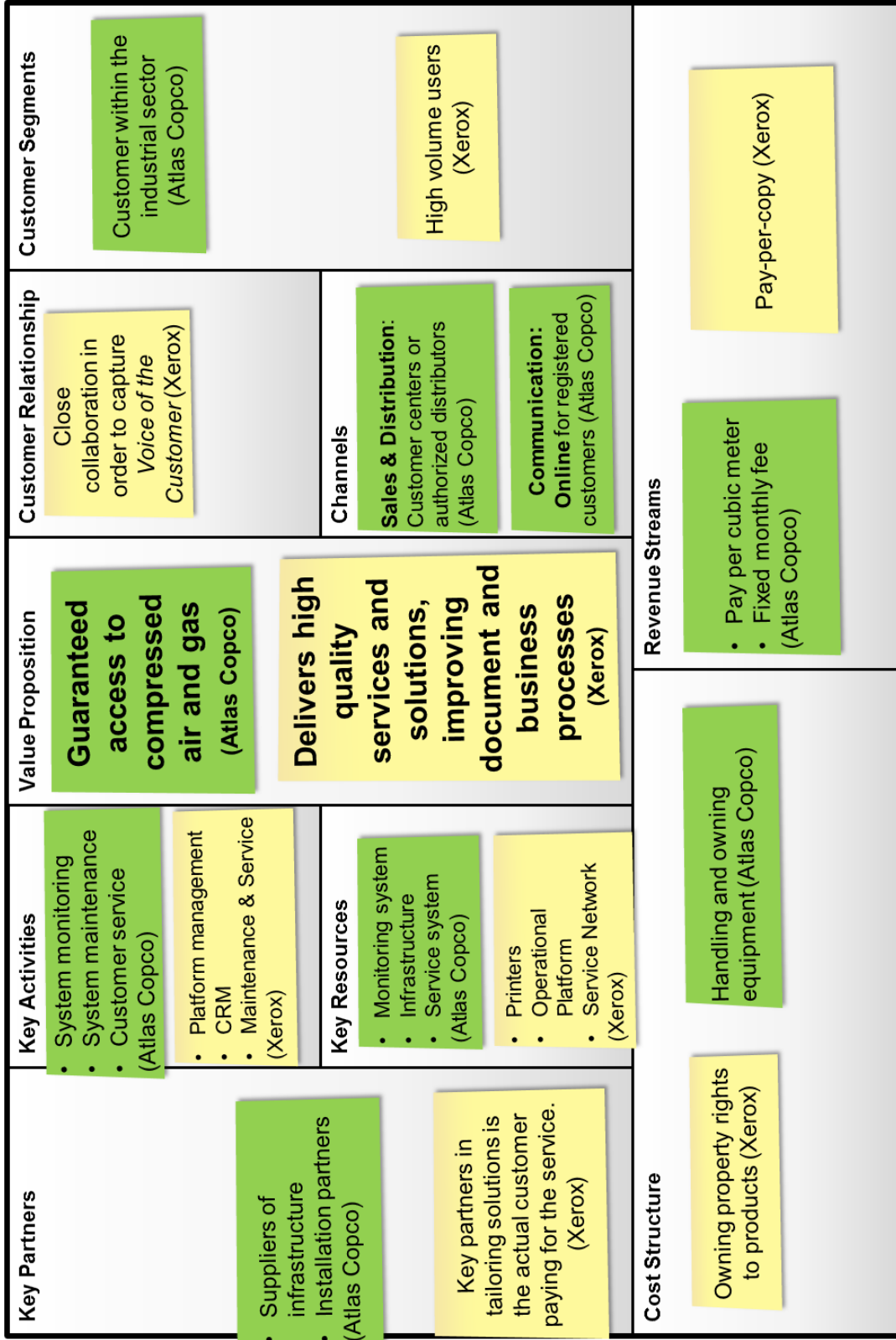
## The business model Canvas



# The business model Canvas

Atlas Copco & Xerox

2015-04-27



# The business model Canvas

Rolls Royce & Toyota Material Handling

2015-04-27

