A study of sustainability and digital sustainability communication within the steel industry

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En studie om hållbarhet och digital hållbarhetskommunikation inom stålindustrin

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Abstract
Sustainability is becoming increasingly important in society and also in the steel industry today. Ovako is one of Europe’s leading engineering steel producers with a favourable position on the market from an environmentally sustainable point of view. By developing a sustainability strategy as well as an Environmental Product Declaration (EPD) for their engineering steel, Ovako wants to strengthen their position on the market and help their customers to make informed purchasing decisions. Since sustainability traditionally has not been an area of focus in the steel industry, it is difficult to predict the effects that the company’s sustainability initiatives might have.

The purpose of the study was to investigate how Ovako could continue working to strengthen their sustainability profile, as well as evaluate the effects that the EPD might have on the industry. Qualitative interviews were conducted with stakeholders with a holistic perspective in order to fulfil the purpose of the study. Additionally, a desktop research based benchmark study was conducted on Ovako’s and their main competitors’ websites to identify areas of improvement for the company’s digital sustainability communication.

Results showed that sustainability is important for all stakeholders within the steel industry and that there are large benefits with investing in sustainability. Working with sustainability is a long-term commitment that companies and organizations must integrate within their core business in order to be perceived as aware and serious. The development of Ovako’s steel EPD is a good first step in the right direction to help their customers to make informed purchasing decisions. However, further initiatives within the industry and the company are needed to drive the sustainability agenda forward. There is still a lack of incentive systems that support benefitting sustainability parameters over price and performance within steel purchasing. Apart from engaging in sustainability, it is central to communicate sustainability strategy and initiatives through digital channels and by targeting the right recipients in order to achieve the desired effect and results.

Key-words
Digital Sustainability Communication, Environmental Product Declaration (EPD), Sustainability, Steel Industry.
En studie om hållbarhet och digital hållbarhetskommunikation inom stålindustrin

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Sammanfattning


Resultaten visade på att hållbarhet är viktigt för alla intressenter inom stålindustrin, att det ligger rätt i tiden samt att det finns stora fördelar med att investera i hållbarhet. Att arbeta med hållbarhet är ett långsiktigt åtagande som bolag och organisationer måste integrera i sin kärnverksamhet för att uppfattas som medvetna och seriösa aktörer. Utvecklingen av Ovakos stål EPD är ett bra första steg i rätt riktning för att hjälpa sina kunder att göra medvetna inköpsbeslut men det krävs ytterligare initiativ inom industrin för att driva hållbarhetsfrågan. Det finns fortfarande avsaknad av system som stödjer premiering av hållbarhetsparametrar framför pris och prestanda inom stålöpp. Utöver att engagera sig i hållbarhet är det centralt att kommunicera sin hållbarhetsstrategi både digitalt och genom att rikta det budskap som ska förmedlas mot rätt mottagare för att uppnå önskad effekt och resultat.

Nyckelord

Digital hållbarhetskommunikation, Environmental Product Declaration (EPD), Hållbarhet, Stålindustri.
5. ANALYSIS AND RECOMMENDATIONS FOR OVAKO ................................................................. 33
   5.1 Right on time to engage in sustainability in the industry .............................................. 33
   5.2 Developing an EPD is a good first step ........................................................................ 34
   5.3 Sharpen conversation about the sustainability of Ovako’s steel .................................... 35
   5.4 Create a relatable conversation and involve others ....................................................... 35
   5.5 Segment customers to kick-start the conversation ...................................................... 36
   5.6 Involve the right people in the conversation ................................................................ 37
   5.7 Engage in external initiatives ..................................................................................... 37
   5.8 Make sure to communicate sustainability .................................................................... 38
   5.9 Target potential partners for co-branding initiatives .................................................. 38
6. DISCUSSION AND FURTHER RESEARCH ........................................................................... 39
   6.1 Sustainability within the steel industry ....................................................................... 39
   6.2 Environmental data within the steel industry .............................................................. 40
   6.3 Scrap-based steel VS ore-based steel .......................................................................... 40
   6.4 Digital sustainability communication .......................................................................... 41
   6.5 Sustainability - an increased focus among investors .................................................... 41
7. REFERENCES ....................................................................................................................... 42

APPENDIX I - Themes for semi-structured interviews for each stakeholder group .......... I
APPENDIX II - Scores by criterion from benchmark study ................................................ II
List of figures

Figure 1. Lifecycle of steel from extraction to recycling. ................................................................. 5
Figure 2. Steel scrap/casting ratio for China, EU-27, USA and the World. ................................. 7
Figure 3. Steps for developing an EPD. ............................................................................................. 15
Figure 4. Research design.................................................................................................................. 16
Figure 5. Ovako’s and total average score from the benchmark study........................................... 31
Figure 6. Total score of each company in the benchmark study......................................................... 31
Figure 7. Timeline of benefits for Ovako’s stakeholders................................................................. 34
Figure 8. Recommended parameters.................................................................................................. 35
Figure 9. Customer segmentation model.......................................................................................... 37
List of tables

Table 1. Definition of scopes and emissions for GHG-protocol.................................................. 14
Table 2. Stakeholder groups for external and internal perspectives............................................ 17
Table 3. Description of criterias and ranking used in benchmark study........................................ 18
Table 4. Categories for companies based on result from benchmark study.................................... 20
Table 5. Disposition for chapter 4 - Results and analysis............................................................ 22
Table 6. List of interviewees and reference numbers................................................................. 23
Table 7. Sum of final score and company by category. ............................................................... 32
Table 8. Disposition for chapter 5 – Analysis and recommendations for Ovako............................ 33
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>B2B</td>
<td>Business to Business</td>
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<td>B2C</td>
<td>Business to Customer</td>
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<td>BOF</td>
<td>Basic Oxygen Furnace</td>
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<td>CAR</td>
<td>Cumulative Abnormal Returns</td>
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<td>CFP</td>
<td>Carbon Footprint</td>
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<td>CO₂</td>
<td>Carbon Dioxide</td>
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<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<td>DJSWI</td>
<td>Dow Jones Sustainability World Index</td>
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<tr>
<td>EAF</td>
<td>Electric Arc Furnace</td>
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<td>EPD</td>
<td>Environmental Product Declaration</td>
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<td>ESG</td>
<td>Environmental and Social Governance</td>
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<td>EU</td>
<td>European Union</td>
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<td>GHG</td>
<td>Greenhouse Gas</td>
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<td>GRI</td>
<td>Global Reporting Initiative</td>
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<td>LCA</td>
<td>Life Cycle Analysis</td>
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<td>PEF</td>
<td>Product Environmental Footprint</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>T&amp;D</td>
<td>Transmission and</td>
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<td>UN</td>
<td>United Nations</td>
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<td>WCED</td>
<td>World Commission on Environmental Development</td>
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<td>ÅRL</td>
<td>Annual reports Act</td>
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Foreword

This report presents our Master Thesis which is the last part of our journey towards a Master of Science in Engineering. The study was conducted at the department of Industrial Economics and Management at KTH Royal Institute of Technology in Stockholm, Sweden.

Firstly, we would like to dedicate a special thank to Oskar Bosson at Ovako for his engagement, good spirits and guidance throughout the process. We would also like to thank Göran Nyström at Ovako for his inspiration and engagement in our thesis. Moreover, we want to thank our supervisor Henrik Blomgren for his ideas and input during the journey.

Finally we also want to express our gratitude to all interview participants for sharing their valuable knowledge and time.

Thank you all, without you this thesis and our last piece of puzzle of engineering studies would not have happened!

Linnéa Grundström & Laura Puskoriute
1. INTRODUCTION

The following chapter presents the background to the study followed by the problem formulation, purpose, research questions and delimitations. Lastly, a list of terms useful for the study is presented.

1.1 Background

Sustainability is becoming more and more recognized as an area of importance to include in both corporate business models and strategy in order to secure future competitive advantage (Berns et al., 2009; Cazier et al., 2011; O’Brien, 2010). Sustainability related activities addressing the three pillars of sustainability; environmental, economic and social, secure long-term relationships with stakeholders by increasing trust, reputation and brand image. There is increasing evidence showing that it is connected to financial performance and success over time (Unruh et al., 2016). Today there is an increased pressure on companies to include and report their sustainability related activities and performance. This is partly driven by increased sustainability awareness within the society that contributes to pressure from legislative and regulative forces, investors, current and potential employees and customers (Deloitte, 2015).

The increased focus on sustainability is no exception for steel manufacturers. The steel industry is one of the most energy consuming industries where the steel and iron sector together accounted for 19% of the total industrial CO₂ emissions in 2015 (PBL and European Commission, 2016). Therefore improvements in sustainability performance and selection of purchased steel directly have a large impact on the environment. Also, steel is integral to the global circular economy due to its infinite recyclability properties (World Steel Association, 2015).

Ovako is one of the leading European producers of engineering steel for the bearing, transport and manufacturing industries. The company’s production is scrap-based, which in general is approximately five times more energy efficient in comparison to ore-based steel production (Jernkontoret, 2015). Also, the company has a geographically favourable position due to the access to electricity from renewable sources. Due to this, Ovako’s steel is one of the most environmentally sustainable steel in the world. The company is in the process of developing a sustainability strategy which aims to help reduce their own and their customers’ environmental impact (Ovako, 2017).

1.2 Problem formulation

Sustainability has traditionally not been the main focus for the stakeholders of the steel industry. However, the industry is transforming and both steel manufacturers and their customers are today facing both regulatory and legal demands. Also the demands from investors and customers are increasing to include, report and value sustainability. Therefore it is difficult to forecast the effects of Ovakos’s sustainability strategy and how the company should develop in order to strengthen their sustainability profile.

One of the actions included in their sustainability strategy is to develop an Environmental Product Declaration (EPD) for their steel. The EPD provides information about the amount of CO₂ emissions that an average Ovako product from their three different production sites contributes with. The aim is to help their customers to make informed procurement decisions and to raise the conversation about sustainability of steel. Today there is no specific standard
for how to assess CO₂ emissions within the steel industry and EPDs are rare within the engineering steel industry. Traditionally, purchasing of steel has been focused on price level, product performance and quality level and not on sustainability related performance. Therefore it is not clear how the industry and its stakeholders will respond to the development of the EPD and the effects it may have for Ovako.

1.3 Purpose
The purpose of the study is to investigate how Ovako could continue working with their sustainability strategy in order to strengthen their sustainability profile. Also, the study aims to evaluate the effects that Ovako’s steel EPD might have on the industry.

1.4 Research questions
MRQ (main research question): How could Ovako continue working with their sustainability strategy in the future?

In order to answer the main research question, the following sub research questions have been formulated;

RQ1: What are the current main trends and driving forces related to sustainability within the steel industry?

RQ2: What effects might Ovako’s steel EPD have on the steel industry?

RQ3: What is important to consider when working with sustainability?

1.5 Delimitations
The focus and approach of the thesis was shaped together with the following responsibles at Ovako: Oskar Bosson (Head of Group Communication) and Göran Nyström (EVP Group Marketing and Technology).

This study is delimited to the Swedish steel industry and its stakeholders. Within the Swedish steel industry there are both scrap-based and ore-based steel manufacturers which in the study are collectively named the steel industry.

The definition of sustainability used in this study refers to developments that “meet present needs without compromising the ability of future generations to meet their needs” (WCED, 1987).

Sustainability is often used as an umbrella term for the three pillars of sustainability - environmental, social and economic. Within this study and its analyses, sustainability is coherently not directly including the economic perspective, hence environmental and social sustainability constitutes the main perspectives (Investopedia, 2015).

1.6 List of terms
Alloys Steel is an alloy with iron as the main component. Alloys such as manganese, silicon, nickel, titanium, copper, chromium and aluminum are used in varying proportions when producing steel in order to manipulate the properties such as hardenability, corrosion resistance, strength and ductility (Greenspec, 2017).
**CO₂ and GHG**
Greenhouse gas (GHG) includes any gas in the atmosphere, which absorbs heat and thereby keeps the planet’s atmosphere warmer than it otherwise would be. The main GHGs in the Earth’s atmosphere are water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and ozone.

Carbon dioxide (CO₂) is the most common GHG emitted by human activities, in terms of the quantity released and the total impact on global warming (Goldenburg, 2000).

**Cradle to gate**
All activities starting with the extraction of materials from the earth (the cradle), their transportation, refining, processing and fabrication activities until the material or product is ready to leave the factory gate (Circular economy, 2017).

**DJSWI**
Is a mix of indices used to evaluate the sustainability performance of the largest companies listed on the Dow Jones Global Total Stock Market Index, that have become the key reference point in sustainability investing for investors and companies (Dow Jones Sustainability World Index, 2009).

**End of life**
The final stage of a product’s existence in the context of manufacturing and the product lifecycle.

**GRI**
GRI is an international standard to help companies, governments and other organizations to understand and communicate their impacts regarding sustainability, including questions related to as climate change, human rights and corruption (GRI, 2017).

**Greenization**
The process of reducing and eliminating the hazards to the environment and human health, to be environmentally acceptable or friendly (He, 2012).

**Scrap-based VS ore-based steel production**
Steel production can be divided into two main routes - primary and secondary. Primary production refers to manufacturing steel through conversion of iron ore to steel through a basic oxygen furnace (BOF). Secondary production addresses the recycled route where steel scrap is remelted into new steel through an electric arc furnace (EAF), (Broadbent, 2016).
2. LITERATURE AND THEORY
This chapter presents the literature and theory for the study and is divided into three parts with the following structure and content:

**PART ONE**
This part of the literature review aims at providing knowledge about sustainability within the steel industry and the steel industry’s role in the circular economy.

**PART TWO**
This part of the literature review provides knowledge about how sustainability can be seen and used as a competitive advantage, the importance for organizations to engage in and incorporate sustainability within their business strategy, the importance of communicating sustainability activities and in what way sustainability is important from different stakeholder perspectives.

**PART THREE**
This part of the literature review describes regulatory forces that drive the increased focus on sustainability for the Swedish steel industry and how sustainability is reported and assessed today.
2.1 Sustainability within the steel industry

The global crude steel production has been constantly growing since 1950 from a volume of 189 million tons to 1629 million tons in 2016. Steel is a permanent material that can be recycled an infinite number of times and it is the most recycled material in the world with a recycled weight of more than all the recycled aluminum, glass, paper and wood (Jernkontoret (1), 2017). The lifecycle of steel from extraction of raw material to recycling is presented in Figure 1.

![Lifecycle of steel from extraction to recycling (Eurofer, 2017).](image)

**Figure 1.** Lifecycle of steel from extraction to recycling (Eurofer, 2017).

2.1.1 Steel scrap

Steel scrap is a valuable input material for steel production. The scrap-based steel production is well-established in Europe as well as the steel recycling system, where 74% of all steel and metal based consumer packaging is recycled and more than 95% of all the steel in cars is recycled (The European Steel Association, 2017). Globally, 85% of the world’s discarded steel is recycled, however only 39% of all steel production input is recycled scrap. Therefore there is potential for increasing the amount of new steel being produced from steel scrap globally (Haslehner et al., 2015). The quality and economic value of steel is not correlated to the share of scrap it is manufactured with. Nonetheless, for steel manufacturers requiring a low level of residual elements in the steel it can be more cost-effective to use more primary material in their production (Broadbent, 2016).

In 2015, World Economic Forum launched a project named “Mining and metals in a sustainable world 2050” with support from The Boston Consulting Group (BCG). Its aim was to present the transformation lying ahead for the mining and metal industry and contribute to a sustainable conversation about the future (Haslehner et al., 2015; World Economic Forum, 2015). The project report acted as a post-2015 development agenda to be discussed during the UN Summit on the Sustainable Development Goals and UN climate change conference (World Economic
A model with two plausible scenarios was created to predict the steel industry’s development through to 2050. The results show that recycled steel will play an increasingly important role in the global industry development. Sweden is no exception of this view on the future. Swedish steel companies developed and agreed on a shared future vision of the steel industry through to 2050, named “Steel shapes a better future”. The vision was created due to the industry’s willingness to have an active role in the society by reshaping all processes to more sustainable. One of the important parts of the vision is to continuously include and increase scrap in steel production. (Jernkontoret (2), 2017; Stockholm Environmental Institute, 2017).

2.1.2 Environmental data within the steel industry
The Worldsteel Association is a non-profit organization that represents 160 steel producers worldwide, national and regional steel industry associations and steel research institutes. In order to calculate and present the current levels of emissions from the world’s steel production the organization collects data from steel companies. The data is only collected from companies that contribute and report data to Worldsteel Association, which is then aggregated and published as world average data for the global steel production. No data for individual steel manufacturers is presented, meaning that neither potential regional differences due to e.g. access to electricity from renewable energy sources, nor differences between ore-based and scrap-based producers can be seen. The methodology used by the Worldsteel Association for calculating emissions includes Scope 1, 2 and 3 according to the GHG protocol; however the upstream value of mining and transports is excluded from the system boundary (World Steel Association (3), 2017).

2.2 Steel within the circular economy
Reusing a material in the production of new material is a way to contribute to a circular economy in the world. The concept of circular economy refers to a shift from linear business models, where products are manufactured from raw materials and then discarded at the end of their useful period, to circular models where the idea is to continue gaining value from the product either by reusing, repairing, returning or recycling (World Economic Forum, 2014; Broadbent, 2016). In other words, a circular economy is a continuous cycle that preserves and enhances natural capital and resources, optimizes yields and minimizes system risks by managing finite stocks and renewable flows (Ellen MacArthur Foundation, 2017).

An interesting example of steel’s role in the circular economy and its challenges can be found in China. China is the largest steel producing and consuming country in the world and accounts for over 50% of the world’s total production of steel. The country’s government has nationally prioritized the development of their steel industry since the 1950’s (Pauliuk et al., 2012; Feng, 1994). By having a large environmental impact through their steel production, China issued the Circular Economy Promotion Law among other legal measures in order to address “reducing, reusing and recycling activities conducted in the process of production, circulation and consumption” (Wübbeke and Heroth, 2014; Circular Economy Law, 2008). One issue is that scrap availability in China is currently much too low to be considered a stable contributor to the steel production, hence the aim and expectation of the law is to improve resource utilization and facilitate sustainable development (Pauliuk et al, 2012). Apart from scrap availability additional challenges were identified, such as inadequate steel manufacturing capabilities and lack of coordination between collection, distribution, processing and utilization of recycled scrap (Wübbeke and Heroth, 2014).
In the study of Pauliuk et al. (2012), a model of China’s steel cycle was developed presenting a quantification of steel demand and scrap supply up to 2100. Independent on the different researched scenarios, results shows that China will experience a great increase of scrap flows between 2025 and 2050 due to the current heavy steel consumption period. This steel cycle change will stabilize during the second half of the century, but by that point the Chinese technological capabilities will be insufficient to process all domestic scrap. Only large investments in secondary production of steel could allow for China to use their own scrap instead of massively export it, in order to contribute to the directions set by the Circular Economy Law. The steel scrap/casting production ratio for China, EU-27, USA and the world between the years 2006 to 2012 is presented in Figure 2, confirming that China lies below the world average (Bureau of International Recycling, 2013).

![Figure 2. Steel scrap/casting ratio for China, EU-27, USA and the World.](image-url)
2.3 Sustainability as a competitive advantage

Companies are acknowledging the fact that incorporating sustainability in their business models is a way to secure future competitive advantage. It is driven by the urge to strengthen reputation and trust, which are the main motivators behind engaging in sustainability initiatives (Berns et al., 2009; Cazier et al., 2011; O’Brien, 2010). These findings are results from a global survey developed by BCG and MIT Sloan Management Review. 1500 corporate executives and managers participated in the study by providing their views on the relationship between sustainability and business strategy. A majority of the respondents believe that the greatest benefits of addressing sustainability issues are improved company or brand image (Berns et al., 2009). Similar findings related to improved brand image and competitive advantage as a result of working with sustainability is presented in a research study on Swedish companies made by Swerea IVF (Jönbrink et al., 2013). Another global executive study performed by BCG and MIT Sloan Management Review shows that investors are increasingly caring about a company’s environmental, social and governance (ESG) metrics (Unruh et al., 2016).

There is increasing evidence showing that a company’s sustainability related activities are connected to its financial performance and success over time (ibid). Companies benefit not only by increasing trust, reputation and image through sustainability initiatives, but also by possibly securing long-term stable ownerships with investors. In a study of 129 European listed companies during 2000-2008 it was found that the climate change issue first became a topic in business around 2004. The study involved companies within different industries and results show that the interest in the topic increased from then until the financial crisis where it became less in focus again (Blomgren et al., 2009). Apart from the financial crisis, an increased awareness of the climate change issue could be seen as an indicator for increased awareness of sustainability.

The steel industry is no exception. Research shows that several sources of competitive advantage that can increase shareholder value can be connected to improvements in both social and environmental performance of steel manufacturers. Such types of benefits are e.g. increased attractiveness of the products to aware customers, enhanced reputation and improved relationships with stakeholders such as government, employees, customers and communities (Arena and Azzone, 2010).

2.4 Sustainability and business strategy

It is becoming more clear and eminent for companies and their external environment that sustainability should be connected to the business strategy in order to secure long-term sustainability of a company. The term corporate sustainability is becoming widely used for that and is based on the concept of sustainable development (Engert and Baumgartner, 2015). Already in 1998, the concept of triple bottom line was propagated by Elkington (1998) with the aim to empower sustainable development in business contexts. Its core meaning is to include not only the economic aspect of sustainability, but also social and environmental and is widely used as a base for corporate sustainability strategies (Werbach, 2009; Engert and Baumgartner, 2015; Dillyck and Hockerts, 2002). There are many ways to formulate a sustainability strategy. Research shows that corporate sustainability strategies need to be tailored to the specific company due to the highly variable company circumstances, which is a difficult task (ibid).
Despite the additional costs related to increased sustainability initiatives and/or strategies, the benefits are often larger than the disadvantages. In order for a company to succeed with their sustainability ambitions the traditional business model has to change to create value for all stakeholders. The internal perspective of sustainability strategy is also important perspective as it is required in order to engage and attract new employees, make existing staff feel proud of their work and in order to build customer loyalty (Whelan & Fink, 2016).

2.4.1 Corporate social responsibility (CSR)
Corporate social responsibility (CSR) is sometimes referred to as sustainability strategy and it is a crucial component for a company's competitiveness. CSR is something that should be led by the company and requires that policies and procedures are in place for integrating social, environmental, human rights and consumer concerns into business operations. This has to be part of a company's core strategy and should always be in close collaboration with stakeholders. A study shows that organisations with a genuine commitment to CSR substantially outperformed those without; with an average 19 times higher return on assets. Additionally, CSR oriented companies had a much higher level of employee engagement and better standard of customer service (Financier Worldwide 2015).

2.5 Sustainability branding and communication
A strong brand together with smoothly functioning operations within competitive industrial markets can be a success factor (Kumar and Christodoulopoulou, 2014). Especially for large and complex buyers whose purchases are of high risk and importance, branding was found to be important (Mudambi, 2002). Compared to the most important aspects of price, performance and delivery, the brand still has a relative importance of 16% which makes is considerably important (Bendixen et al., 2004).

Sustainability initiatives, independent on whether they are environmental or social, can create sustainability associations with the corporate brand. Therefore an integration of sustainability into branding can increase the industrial companies’ appeal to sustainability-oriented customers. This also allows for the opportunity to communicate these practices to their customers and transform them into associations that become connected to their brand image (Kumar and Christodoulopoulou, 2014). This view is shared in a report developed by PwC about the future of mining (PwC, 2017). Several factors were identified for miners to secure a competitive advantage that involve sustainability branding and communication towards and together with their customers. One example is to get involved with externals, e.g. through a co-branding initiative with a car manufacturer to supply environmentally sustainable raw materials to a vehicle with a large branding focus on sustainability. This could as well naturally be applied to a scrap-based steel manufacturer who is not directly involved in mining due to the same nature of the supplier-customer relationship (ibid).

2.5.1 Digital sustainability communication
Online sustainability communication has become increasingly important and along with sustainability reporting requirements, companies today are considering how to best produce and share sustainability information. Companies are realizing, in the time of digitalization and changing societal expectation, that sharing their sustainability strategy through channels other than their sustainability report creates stakeholder trust and confidence. The key takeaways from a seminar with some of the leading sustainability communicators in Singapore, on how to best develop and communicate sustainability digitally are; sustainability campaigns with a
distinct look and feel and room for flexibility and creativity in the sustainability section. Also, it was found that a good technology platform is important for multi-channel sustainability communications (Black Sun, 2017).

60 companies that are recognized as leaders in corporate sustainability reporting in the world were included in a study performed by AltaTerra Research about how sustainability strategy is communicated online and how it has evolved through time. One of the key takeaways is that sustainability communication has gone from one-way to two-way communication. The companies leading in stakeholder communication and effective online reporting all had dynamic, transparent and interactive websites. The authors of the report developed an analytical framework as a result of the study and identified eight essential criteria for effective online communication and engagement. These criteria are the following: ease of access to information, ease of navigation, graphics, engagement, timeliness, completeness, performance statistics, external assurance (Gonzalez, 2010; BusinessWire, 2010; CSRwire, 2010).

2.5.2 Greenwashing – a pitfall in sustainability communication

Even though there are benefits with communicating sustainability practices, companies should consider carefully how that should be done. If a company puts more effort into communicating their “green” activities than improving their practices, it can translate into a phenomenon called “greenwashing” (Werbach, 2009). Greenwashing appears when firms advertise environmentally friendly practices that do not reflect the firm's true activities. This often causes the market to react negatively and the public to doubt the sincerity of greenization message. According to a study of the Chinese stock market, the market disfavors greenwashing as it is significantly negatively associated with cumulative abnormal returns (CAR), which is the sum of the all differences between the actual return of a security and the expected return (Du, 2015). Investors adhere to the impression that the company is environmentally unfriendly and thereby value the company negatively. The study also provides evidence for that corporate environmental performance is significantly positively associated with CAR around the exposure of greenwashing. It inspires regulators and the public to link corporate environmental performance to factual greenization rather than accepting greenwashing in advertising messages. This proves that firms should fulfill their environmental responsibility in substance rather than in false claim – otherwise, the market might punish the firm (ibid).

2.6 Perspectives on the importance of corporate sustainability

Corporate sustainability is a business approach that creates long-term stakeholder value by creating a "green" strategy aimed toward the natural environment and taking into consideration every dimension of how a business operates in the social, cultural, and economic environment (Dočekalová & Kocmanová 2016). The views on the importance of corporate sustainability from different stakeholder perspectives are presented in the chapter below.

2.6.1 Investors

Despite that corporate sustainability has started to be recognized as important, many companies have concerns on whether investors are aware of their corporate sustainable decisions, understand their actions and are able to evaluate progress and competitive positioning. If the financial markets do not value a company’s corporate sustainably efforts, companies do not have the incentives to become and/or continue to be corporately sustainable. In a study regarding the impact of inclusion and exclusion of the Dow Jones Sustainability World Index (DJSWI), it was found that investors value sustainability only in a temporary way as there only is a temporary change in both price and liquidity (Cheung, 2011).
However, in the last years, investors have changed their investment strategies in favour of more sustainable companies included in the DJSWI (Baas et al, 2016).

The number of U.S. investment funds incorporating environmental, social and corporate governance (ESG) criteria jumped 28% up to 925 from 2012 to 2014, more than quadrupling their assets to $4.3 trillion. Even though analysts always can make mistakes, research shows that 80% of academic studies found that the stocks of companies with good sustainability practices do better than other stocks (Steverman, 2015).

Hållbart Värdeskapande is a cooperation project between Sweden's 17 largest investors and Nasdaq Stockholm. 100 of the largest companies on the stock exchange participated in the project by answering a questionnaire in three rounds (2009, 2011 and 2016). Results point to the importance of including and supporting sustainability issues. Over 85% of the companies were identified to have processes to identify strategic business opportunities and risks related to sustainability and that 10% of companies have linked sustainability targets to salary or bonus. Also, most companies have defined goals for their sustainability efforts (Hållbart Värdeskapande, 2017).

2.6.2 Employees
Corporate sustainability has a positive effect on employee commitment and organizational citizenship behavior (Choi and Yu, 2014). In a study based on a sample of 6000 employees from six different European countries it was found that corporate sustainability reinforces the positive relationship of ability-enhancing (i.e. recruiting of new employees, selection and training) and motivation-enhancing (i.e. performance management, compensation and incentives) and that these practices improve benevolent and principled organizational ethical climates (Guerci et al, 2015).

2.6.3 Customers
Companies that value environmental protection, philanthropic behavior and ethical business practices are perceived by customers to be good corporate citizens, and are able to differentiate themselves from competitors and attract customer loyalty (Cacioppe et al, 2007; Ameer and Othman, 2012).
PART THREE

2.7 International initiatives calling for climate action
There are forces from both the United Nations (UN) and the European Union (EU) that affect the national focus regarding sustainability in Sweden, which in turn affects the demands on Swedish stakeholders and Swedish steel industry. Some of these forces regarding climate and CO₂ emissions are further described below.

2.7.1 The UN’s sustainability initiatives
The UN has developed the Sustainable Development Goals (SDGs) which are a set of 17 universal goals for a better world that came into force in 1 January 2016. These goals are unique since they call for action by all countries. The goals are not legally binding, but governments are expected to take ownership and establish national frameworks for the achievements of the 17 goals (GRI, 2016). The UN has also established ten principles of the UN Global Compact that states how companies should approach business for long-term success and to uphold their corporate and basic responsibility to people and the planet (UN Global Compact, 2016).

2.7.2 The EU’s sustainability initiatives
In 2014 the EU 2030 climate and energy framework was adopted by EU leaders and these climate actions has three main targets for the year 2030 regarding reducing GHG emissions, increasing the share of renewable energy sources and improving energy efficiency (European Commission, 2017). Also the EU are developing a plan that will be introducing in 2018 for how to stabilize the market in order to handle the excess amount of certificates of emissions that has been created during the last years. The aim is to make it more beneficial to decrease emissions rather than buying more certificates (Sveriges Riksdag, 2016).

2.7.3 The Paris Agreement
Another global initiative taken to reduce the GHG emission is the Paris Agreement. The Paris Agreement is an agreement between 196 countries for a universal climate action plan valid for all countries, including all the major GHG emitters. Also, the countries have agreed to hold the increase of the global average warming to below 2° C with an established target of 1.5 °C. The agreement is unique as all other previous attempts to negotiate a universal agreement have either failed or resulted in a very limited set of countries taking on this type of agreements (Wei et al, 2016).

2.7.4 International initiatives on company level
According to the UN the investments made in sustainable development will help address climate change by reducing GHG emissions and build climate resilience. Conversely, action on climate change will drive sustainable development in general. Many companies and organizations use these goals in order to develop their own policies regarding sustainability. Both The Worldsteel Association and The Swedish Steel Producers Association (Jernkontoret) have interpreted these goals in order to develop industry sustainable principles (Worldsteel Association (2), 2017; Jernkontoret (3), 2017). According to Jernkontoret, the international recommendations and goals are not required in order to motivate companies to continue with their sustainability related activities; however they should be used as a compass to presuppose from and in order to, from a broader perspective, see that the sustainable development in Sweden is going in the right direction (Jernkontoret (4), 2017).
2.8 Sustainability reporting
Organizations have a major impact and can make real difference towards a more sustainable world. By measuring environmental impact companies can work toward a sustainable development. Targets within the UN SDGs therefore aim to also advance sustainability reporting worldwide as this is seen as a key tool for companies to advance the private sector contribution to global development (GRI, 2016). A sustainability report is a report published by a company or organization for the economic, environmental and social impacts caused by its everyday activities. It demonstrates the link between an organization’s strategy and its commitment to a sustainable global economy (GRI, 2017). According to a report published by EY (2016), sustainability reporting can serve as a differentiator in competitive industries and foster investor confidence trust and employee loyalty. In a review of more than 7000 sustainability reports globally it was found that sustainability disclosures are used by analysts to determine firm’s value and that this may reduce forecast inaccuracy by roughly 10% (EY, 2016; Dhaliwal et al, 2012). Reporting is expected of the top companies within the modern business world. In 2011 more than 2200 firms filed reports according to the Global Reporting Initiative (GRI) and the number of companies reporting grows for every year (Corporate Register, 2012).

2.8.1 Sustainability reporting in Sweden
From the financial year that started December 31, 2016, larger companies that are covered of the Swedish regulations ÅRL, ÅRKL or ÅRFL have to report sustainability. These changes are based from the EU directives for accounting (2014/95/EU), but the Swedish regulations are even stricter regarding which companies that has to report, increasing the amount of companies that will be forced to report. The companies that have to sustainability report are companies that have an average number of employees of more than 250 people, which have a balance sheet total of more than 175 million SEK and a net turnover of more than 350 million SEK (FAR, 2016).

The minimum demands for what should be included in the report are according to ÅRL §12. The report should also describe the company’s business model, policy documents, results from their policies and a definition of risk areas and how these are being handled. A company can select to meet this legislative demand by reporting according to the GRI standards, but then the companies have to ensure that all the reporting demands according to ÅRL have been met (FAR 2016).

2.9 Sustainability assessment and declaration
There are many different assessment tools for companies to calculate, define and verify their emissions in order to develop sustainability credentials that will enhance their brands and engage stakeholders. Most assessment tools perform some kind of life cycle assessment, however there are differences between what is included and not.

2.9.1 GHG-Protocol
The most widely used assessment tool is the GHG-protocol that defines direct and indirect emissions and three different scopes for life cycle assessment defined in Table 1 (GHG Protocol, 2017).
Table 1. Definition of scopes and emissions for GHG-protocol (GHG Protocol, 2017).

<table>
<thead>
<tr>
<th>Scope</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct GHG emissions</td>
<td>Emissions from sources that are owned or controlled by the reporting entity</td>
</tr>
<tr>
<td>Indirect GHG emissions</td>
<td>Emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.</td>
</tr>
<tr>
<td><strong>Scope 1</strong></td>
<td>All direct GHG emissions.</td>
</tr>
<tr>
<td><strong>Scope 2</strong></td>
<td>Indirect GHG emissions from consumption of purchased electricity heat or steam.</td>
</tr>
<tr>
<td><strong>Scope 3</strong></td>
<td>Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&amp;D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.</td>
</tr>
</tbody>
</table>

Guidance is available in order to assess both scope 1 and 2. However, little information has been published to guide practitioners on how to deal with scope 3 emissions and which of these sources that is relevant to particular organizations (Downie & Stubbs, 2013). According to GHG Protocol (2017) the majority of the corporate emissions come from scope 3 sources, meaning that companies are missing out on opportunities for improvement (GHG Protocol, 2017). According to Sanchez et al (2010), the scope 3 emissions often constitute up to 75% of many firms’ overall GHG footprint. The lack of knowledge of scope 3 emissions inhibits a firm’s ability to pursue the most cost-effective GHG mitigation strategies. All organizations have a significant role to play in mitigating global warming from the GHG emitted throughout their value chain, or supply chain, known as scope 3 emissions (Sanchez et al, 2010).

2.9.2 Product Environmental Footprint (PEF)

The European Commission has developed a Product Environmental Footprint (PEF) with the aim to develop a harmonized European methodology for environmental footprint and with the objective to: “Establish a common methodological approach to enable Member States and the private sector to assess, display and benchmark the environmental performance of products, services and companies based on a comprehensive assessment of environmental impacts over the life-cycle” (European Commission, 2012).

2.9.3 Environmental Product Declaration (EPD)

An EPD is an independently verified and registered document that communicates transparent and comparable information about the environmental impact of products based on a life cycle analysis. EPDs are normally valid for three to five years and are based on the ISO standards declaration which makes the EPD a wide-spread and internationally accepted assessment tool (Environdec, 2017). The five steps for developing an EPD are presented in Figure 3.
2.9.4 EPDs in the steel industry

The Swedish steel manufacturing company Outokumpu was one of the pioneers in developing a steel EPD in the industry. According to Outokumpu, their customers can use their EPD as a reliable source when making life cycle analysis (LCA) for their products or to find sustainable steel for a project. The information in the EPD is also useful for e.g. product design marketing and procurement. However, today requirements for this type of declaration are particularly common in the building and construction industry where the developers are required to report on environmental effects of the construction material used and of the building itself during its life cycle (Outokumpu, 2015).
3. METHOD

This chapter presents the methods used to answer to the purpose of the study. Firstly, the overall research method and the methods for the benchmark study and interviews are described. Thereafter, a discussion regarding the selection and reliability of methods is presented.

3.1 Research design

This study had been conducted with an inductive approach where the empirical findings have been used to iteratively develop and improve the material throughout the process. The research design is presented in Figure 4.

![Figure 4. Research design.](image)

During the initial research setup phase of the study, information about the company and industry was gathered in order to create a general understanding for the company and the industry. In order to scope the study meetings were held initially with representatives from the company and a study visit was done to one of Ovako’s productions sites. A preliminary literature review was performed to increase the level of knowledge related to the problem and to help develop the study. From there, the purpose of the study was defined and the selection of interviewees and the main interview questions were determined. Continuously throughout the interviewing process, the literature review has been developed in order to understand, explain and motivate findings and gain new knowledge.

Early within the process, sustainability communication was found to be important for companies working with sustainability in order to get the full benefits of their engagement. Therefore, apart from gaining knowledge from interviews a desktop research based benchmark study was performed with the aim to present a current competitive picture of corporate sustainability communication and activity within the industry. From this, improvement areas were identified and presented to the company. The interviews and the benchmark study contributed with the empirical findings and results to the study.

3.2 Qualitative interviews

The purpose with qualitative interviews is to create a deeper understanding for different situations or subjects and is often performed on a smaller selection of people (Sörqvist, 2000, p 51). A qualitative interview can be both unstructured and semi-structured. When using an unstructured interviewing method it is not determined on beforehand what answers one wants to
receive from the interview. Often one just starts from a general headline or area and this type of interviewing method is most common in the beginning of a process to gather empirical impartially. Semi-structured interviews are the most common method to gather empirical material when using interviews as a method. The semi-structured interviews are organized around a number of themes or areas of questions that are determined on forehand. The questions should not be too detailed and should make it possible for the person being interviewed to influence what questions that will be answered (Blomkvist & Hallin, 2015).

In this study, the semi-structured interview approach has been applied in order to capture both an external and internal perspective that is represented by different stakeholder groups. The stakeholder groups represent the following stakeholders: sustainability experts, industry experts, investors, customers and sales area managers according to Table 2. Important to note is that the interviewees within the customer stakeholder group are not direct customers to Ovako. The stakeholder group is represented by people with large experience and insight within steel sourcing and procurement.

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Stakeholder groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Sales area managers</td>
</tr>
<tr>
<td>External</td>
<td>Sustainability experts, industry experts, investors and customers</td>
</tr>
</tbody>
</table>

Based on the different categories thematic areas with a few main questions were determined see APPENDIX I for the general structure of interviews. The interviews within the same stakeholder group followed the same structure in order to receive different perspectives on the same areas and questions. The structure for the interviews for the different categories differs on some areas as the different categories were expected to contribute with different knowledge. The interviews within the same category continued until the same answers were recurring, which is known as saturation of questions (Sörqvist, 2000). Additionally, some questions were either changed or added throughout the process as a result of the continuous learning process.

3.3 Benchmark study
The benchmark study aims at comparing Ovako against it’s main competitors, based on their engagement in sustainability activities and their ability to communicate these activities through their websites. Strategies and activities should be communicated in channels available for customers, partners and the public. According to the global communication agency Cohn & Wolfe, communication is a vital part in any sustainability strategy in order to implement change and make an organization more sustainable. The field of research of evaluation of digital sustainability communication such as websites is still limited, despite that sustainability communication through digital channels is increasingly playing an important role for companies within many industries (Siano et al, 2016; Basil and Erlanson, 2008; Capriotti, 2011).

3.3.1 Method for benchmark study
The benchmark study was performed by including the following four steps; planning, desktop research, analysis and discussion. These steps are further described below;
Planning

During this phase the scope of the benchmark was set, criteria of comparison were identified and defined and the data collection approach was selected.

The approach for collecting data for the benchmark study was to map Ovako against their competitors based on desktop research of each company’s websites. The selection of companies to be included in the study was received from Ovako, as they represented their main competitors. The criteria of evaluation in the study were the following; 1. ease of access to information, 2. ease of navigation, 3. graphics, 4. engagement, 5. timeliness, 6. completeness, 7. performance statistics, and 8. external assurance. These criteria were found as common key criteria that distinguished the leaders of sustainability communication from others in a study performed by Alta Terra (Gonzalez, 2010). Therefore, these criteria were chosen as suitable for evaluating a company’s sustainability communication on their website. From that, an interpretation and definition of each criterion was decided. Each company’s performance within the criteria one to six was ranked according to a linear scale from one to four. The aim of eliminating a mid-point option on the scale was to decrease social desirability bias, since it is common to choose the answers in the middle to avoid choosing sides (Garland, 1991). Criteria number seven and eight were provided with a possible scoring of either one or four responding to Yes or No. The description of the criterias and the ranking of these criterias are presented in Table 3.

Table 3. Description of criterias and ranking used in benchmark study.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition of criteria</th>
<th>Definition of ranking levels</th>
</tr>
</thead>
</table>
| 1. ease of access to information | The extent to which sustainability information is easily and intuitively found         | 4 = First page  
3 = 1 click away  
2 = more than 1 click away  
1 = no access to information |
| 2. ease of navigation         | The extent to which sustainability information is collectively gathered and easily navigated through | 4 = most information is gathered  
3 = some information is gathered  
2 = little information is gathered  
1 = no access to information |
| 3. graphics                   | The extent to which the graphics of sustainability information are attractive          | 4 = very attractive  
3 = attractive  
2 = acceptable  
1 = unattractive/non existent |
| 4. engagement                 | The extent to which the company is engaging in environmental and social sustainability related activities | 4 = the company is greatly engaged in both social and environmental areas  
3 = the company is engaged in both social and environmental areas  
2 = the company is engaged in either the social or environmental area  
1 = the company is not engaged in any of the sustainability areas |
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5. timeliness</strong></td>
<td>The extent to which the sustainability information is updated</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 = sustainability information for the year 2017 is accessible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = sustainability information for the year 2016 is accessible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = sustainability information for the year 2015 is accessible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = specific sustainability information cannot be found</td>
<td></td>
</tr>
<tr>
<td><strong>6. completeness</strong></td>
<td>The extent to which the company’s collective sustainability information reflects completeness</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 = very much</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = much</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = partly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = not at all</td>
<td></td>
</tr>
<tr>
<td><strong>7. performance statistics</strong></td>
<td>The extent to which sustainability performance statistics are presented</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 = Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = No, and/or reports are not found through website</td>
<td></td>
</tr>
<tr>
<td><strong>8. external assurance</strong></td>
<td>The extent to which the company’s annual report and/or sustainability report has been evaluated by an external part/parties</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 = Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = No, and/or reports are not found through website</td>
<td></td>
</tr>
</tbody>
</table>

*Desktop research*
During this phase the data was collected from the different companies websites based on the eight criteria and ranked according to Table 3.

*Analysis*
During this phase the collected data was summarized and analyzed. Ovako was compared against the competitors through comparison of the company’s score against the average value of each criterion. For each company, the sum of all rankings was also calculated in order to provide a total score. Based on the final score, each company was placed within one of the following four categories presented in Table 4.
Table 4. Categories for companies based on result from benchmark study.

<table>
<thead>
<tr>
<th>Sum of final score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-32</td>
<td>A = companies whose websites are a well developed and functional channel for sustainability communication</td>
</tr>
<tr>
<td>21-26</td>
<td>B = companies that have started to develop the website to a channel for sustainability communication, but with few identified areas of improvement</td>
</tr>
<tr>
<td>15-20</td>
<td>C = companies that have started to develop the website to a channel for sustainability communication, but with many identified areas of improvement</td>
</tr>
<tr>
<td>8-14</td>
<td>D = companies that have not developed their website into a functional channel for sustainability communication with appropriate information</td>
</tr>
</tbody>
</table>

Discussion
During this phase a discussion regarding the method of the desktop research based benchmark study and the summarized results was performed. The discussion for the benchmark study can be found in Chapter 3.4.2.

3.4 Discussion of method and reliability

3.4.1 Interviews
The choice of performing semi-structured interviews offered a balance between the flexibility of an open-ended interview and the focus of a structured interview. This resulted in broader answers for questions within the determined thematic areas of focus for the study. Some new questions and thoughts arose during the interviewing process and therefore it was valuable to return with additional questions to some of the interviewees. This was a good way to find new knowledge and confirm thoughts, assumptions and information.

The purpose of selecting perspectives and different stakeholder groups for the interviews was to gather knowledge from the environment of the company. Through this, the aim of getting a holistic understanding about sustainability within the steel industry was reached. The choice of investigating the different stakeholder groups and hence present a broad picture of insights naturally resulted in findings on a high level for Ovako and the steel industry. The small sample size for each stakeholder group of interviewees is not large enough to develop detailed strategic recommendations for Ovako and would therefore not suit a study with that aim. However, it provides a desired picture for this study and an indication for how different stakeholders view and approach sustainability today.

There is always a risk that respondents may try to portray themselves or their organization in a way that they think the society or the researcher finds more favourable than their true beliefs (Grimm, 2010). In order to reduce the risk of bias, the interviewees representing the external customer’s stakeholder group were not Ovako’s customers.
3.4.2 Benchmark study

The benchmark study aimed to give an indication about the extent Ovako and their main competitors are engaging in sustainability activities and how well they communicate it through their websites. As websites often are the first point of contact with a company, they are platforms for first impressions. This makes websites powerful communication platforms of activities that might be perceived as beneficial for the company or its environment. Hence, we argue that analyzing and comparing this channel is relevant as it is likely that a majority of a company’s sustainability related activities are communicated through the website. However, it is possible that parts of information regarding a company’s sustainability work is not included within the assessment as there might be information that is not published on the website.

The benchmark only studies how good the companies are at communicating sustainability and is not evaluating the quality or the consequences of the companies’ sustainability activities. The study of the websites gives a high-level indication and not a detailed analysis of how much Ovako and the company’s main competitors are engaged in sustainability related activities and how well they communicate this toward their external environment. Nonetheless, the eight criteria are the resulting criteria in which the top performers of AltaTerra’s study all had high performance. This implies that working more with these criteria within of corporate sustainability communication can be beneficial. A more thorough analysis including qualitative data gathered through e.g. interviews at each company would most likely provide a more accurate benchmark and deeper knowledge.

It can be argued that the grading of each company’s performance for criteria 2. ease of navigation, 3. graphics, 4. engagement and 6. completeness is done subjectively, since these were not ranked on specified and absolute factors. Therefore this opens up for different and personal interpretations. Regarding the method of scoring each company’s performance on a scale of one to four for criteria number one to six and only one or four for criteria number six to eight, one can argue that the results of the benchmark study have low reliability. One reason for that is because the scoring is partly based on subjective judgment; another because the scale is so rigorous that companies might get the same scores even though there are differences between them. A scale including more steps would allow for a more detailed, nuanced analysis where the positions of all companies most likely would be more spread and differ to a higher extent. This in turn would provide more detailed results, which would raise the level of reliability of the benchmark analysis.
4. RESULTS

This chapter is divided into three parts, each related to answering a research question.

The disposition for this chapter is presented in Table 5 below. Thereafter a list of the interviewees and their assigned reference numbers used in the presentation of the results is presented in Table 6.

Table 5. Disposition for chapter 4 - Results and analysis.

<table>
<thead>
<tr>
<th>Part A</th>
<th>Part B</th>
<th>Part C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RQ1: What are the current main trends and driving forces related to sustainability within the steel industry?</strong></td>
<td><strong>RQ2: What effects might Ovako’s steel EPD have on the steel industry?</strong></td>
<td><strong>RQ3: What is important to consider when working with sustainability?</strong></td>
</tr>
<tr>
<td><strong>Trends related to sustainability</strong></td>
<td><strong>EPD</strong></td>
<td><strong>Long-term thinking and adaptation to own business</strong></td>
</tr>
<tr>
<td>Weight reduction and high strength</td>
<td>The choice of EPD as an environmental assessment tool</td>
<td></td>
</tr>
<tr>
<td>Climate change and social sustainability</td>
<td>Effects of the EPD in the industry</td>
<td>Communication is key – results from the benchmark study</td>
</tr>
<tr>
<td>Life cycle analysis</td>
<td>EPD - part of something larger</td>
<td></td>
</tr>
<tr>
<td>Transparency</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Driving forces for increased focus on sustainability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owners and investors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current and potential employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory forces</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Case</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The case of Electrolux - a deep dive into the customer driving force</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6. List of interviewees and reference numbers.

<table>
<thead>
<tr>
<th>Reference number</th>
<th>Name of interviewee</th>
<th>Role and company of interviewee</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carsten Blank</td>
<td>Sales area manager for Ovako - Central Europe</td>
</tr>
<tr>
<td>2</td>
<td>Jukka Kivelo</td>
<td>Sales area manager for Ovako - Scandinavia</td>
</tr>
<tr>
<td>3</td>
<td>Jan Agri</td>
<td>Senior Advisor at Diplomat Communications and former manager of sustainable dairy farming at DeLaval</td>
</tr>
<tr>
<td>4</td>
<td>Johannes Grunselius</td>
<td>Analyst at Handelsbanken</td>
</tr>
<tr>
<td>5</td>
<td>Karin Östman</td>
<td>Senior Policy Advisor Environment at The swedish Steel Producers Association (Jernkontoret)</td>
</tr>
<tr>
<td>6</td>
<td>Cecilia Nord</td>
<td>Director Responsible Sourcing at Electrolux</td>
</tr>
<tr>
<td>7</td>
<td>Anders Freychuss</td>
<td>EVP Global Standardization and Sustainability at Camfil Group, former CEO at Camfil Group</td>
</tr>
<tr>
<td>8</td>
<td>Robert Westlund</td>
<td>Environmental strategist at FMV</td>
</tr>
<tr>
<td>9</td>
<td>Carina Kit</td>
<td>Project leader sustainability and responsible for sustainability internally at ÅF</td>
</tr>
<tr>
<td>10</td>
<td>Don Market</td>
<td>Global VP Commodity Steel within sourcing and procurement at Electrolux</td>
</tr>
<tr>
<td>11</td>
<td>Thomas Hörnfeldt</td>
<td>VP Sustainability and Public Affairs at SSAB</td>
</tr>
<tr>
<td>12</td>
<td>Anna-Karin Jönbrink</td>
<td>Responsible for areas of Ecodesign, Circular Economy and Energy and Environment at Swerea IVF</td>
</tr>
<tr>
<td>13</td>
<td>Devdeep Chakraborty</td>
<td>Senior Analyst at Nordea</td>
</tr>
<tr>
<td>14</td>
<td>Jacob Michaelsen</td>
<td>Head of sustainable bonds (Capital Markets) at Nordea</td>
</tr>
</tbody>
</table>
PART A

4.1 Weight reduction and high strength
From both internal and external expert perspectives, reducing the weight and increasing the strength of steel is one of the main trends. This is especially in focus within the automobile industry which is the pacemaker for the rest of the steel industry. Parts are reducing in size due to the trend toward more specialized steel with certain properties [1,2]. One reason to think that this trend will continue within the transport sector is an increasing pressure by emission allowances, which so far has been low. This affects the steel industry, both because it is dependent on transporting the steel but also since it delivers steel to the transport sector. The sector will be pressured to improve from many different angles – e.g. by using fuel with less environmental impact, demanding higher performance demands on motors and weight reduction [5]. This is positive from an environmental perspective since reduced weight decreases environmental impact due to decreased processing needs and lighter vehicles [2,11]. Nonetheless, it is important to mention that weight reduction is a general trend that can be seen within different type of industries and it might demand a change from the traditional business model and way of selling the material by weight. This in turn implies that there can be future needs of developing new business models that support this development [3].

4.2 Climate change and social sustainability
Climate change is a trend and an important subject for many organisations and it is especially important within the steel industry since it has such a large environmental impact [3,5]. Today there are companies that specialize in working with estimating and calculating allowed levels of CO₂ emissions for other companies and organisations, something that was not common some time ago. The environmental focus has been a trend for some time, but now the focus on the social aspects of sustainability like safety and human rights are increasing [3]. From the perspective of an industrial manufacturer of goods, there is a large focus on social sustainability such as ethics, anti-corruption and human rights and this will increase in the future. This is largely driven by international legal means and frameworks [6].

4.3 Life cycle analysis
Performing LCA’s is an increasing and noticeable trend for industrial manufacturers, even though it is very hard to use these types of analyses for environmental impact of a product as there are no set standards for developing and performing these analyses. Hiring different companies or institutions to perform LCA’s often leads to different results. This makes it hard to compare LCA’s between different products and customers and to know which is the most correct assessment tool [7].

There is a challenge of assessing steel in the development of a LCA since the only data available is world average data. Institutions that performs LCA’s, such as Swerea IVF, purchase environmental performance data from databases such as Ecoinvent. Industry organisations such as World Steel Association and Jernkontoret have not been active in making environmental performance data of their members visible, so the only data that is available through Ecoinvent is world average data through World Steel Association. This implies that it is difficult to use the data in order to evaluate if one type of steel is better than another from an environmental perspective. This is a shame especially for Swedish steel that has environmental advantages compared to other parts of the world [12].
4.4 Transparency
The focus is shifting towards including larger parts of the value chain when engaging in sustainability related issues. This applies both for environmental and social sustainability. Transparency follows as an important trend together with this driven by increased demands from investors and customers [14]. Usually this implies putting pressure backward in the value chain, but sometimes even forward toward customers. This could be by e.g. making sure that the wrong customers do not use your products or associate them in any negative manner for the company [6]. Companies must be aware of and be able to discuss and communicate their weaknesses as well as strengths - e.g. a steel manufacturer must be able to discuss the use of alloys that are bad from an environmental aspect [3].

4.5 Driving forces for increased focus on sustainability

*Owners and investors*
Sustainability is becoming a more and more important issue for owners and investors and the demands for sustainability performance are increasing [3, 4, 5, 6, 9, 11, 13, and 14]. Sustainability reporting is a trend that is becoming increasingly important for public and private investors and the information included is increasingly asked for. Sustainability reports are used both to get an overview of a company’s sustainability profile and as a material for communication [13]. Some customers require ESG guidelines and specifically for steel manufacturers it is important to present information about the company’s energy usage and CO₂ emissions [14]. It is not a direct requirement from analysts, but is to a larger extent becoming a prerequisite as part of company analyses. The customers are still only focused on price and quality, but the focus on sustainability in general is increasing while being pushed by owners and investors. Not long ago this was an aspect that was never included in the analysis of companies [4]. Also it is important to report sustainability, since investors are not interested in investing in companies that do not work with these questions as there are large risks associated with not including sustainability in the business strategy [5, 13, and 14]. Specifically, greenwashing and accidents are two major risks for a company like Ovako, as it is bad for the reputation and it would create negative headlines and associations [6, 14]. In general it is not a risk to invest in sustainability from a long-term perspective as sustainability often is financially beneficial. Investors that study Ovako have a specific perspective that they focus on that includes the risk perspective of investing in mining. This makes it important to increase the transparency and communication of information as this will result in better analyses with lower risk [14].

Culture, geographic location and the economic situation on the market affects the focus for investors and companies within certain areas. Hence, the large focus on sustainability that is in the Nordic countries is not the same in many other countries. Hence, something that is considered to be a “green” project in China does not necessarily have to be considered as a “green” project in Sweden [14]. Today it is more expensive in EU to have high emissions than in other parts of the world. This will change in the future and companies in other regions will have to make types of investments that companies within the EU already have done or might be required to do [14].

One example of how the increased focus on sustainability is affecting the market is the founding of a green hedge fund for investing in “green” companies in May 2017 [13], and also green bonds. Green bonds are new since 2012 with the aim is to find investments for green projects where climate and CO₂ emissions are of main focus [14].
Current and potential employees
One of the main driving forces for companies to focus more on sustainability is to secure a recruitment pipeline of great people since it strongly affects the selection of employer [5, 7, and 9]. There is a trend of opting out working in industries or companies that have a large negative environmental impact with no long-term sustainability strategy. It is part of being a modern and attractive employer to look ahead and take long-term responsibility for the new generation of workers and to maintain current employees. Caring about sustainability related issues is more natural for the new generation, but it is still difficult to know if it is a differentiator or dealmaker for them in recruitment situations [6].

Customers
Sustainability demands from customers are gradually increasing for many B2C companies [6]. The main benefit for companies focusing more on sustainability is increasing trust from the customers. An increased focus on sustainability can increase the image of being a serious supplier which might increase customer loyalty [5,9]. Nonetheless, the pressure is perceived to be larger from employees, owners and the society than from customers [5]. The customers should not necessarily be the main target for a company's sustainability initiatives but it can be beneficial to discuss customers’ standpoint and interest within sustainability to create a broader relationship to them [3].

Regulatory forces
Laws and regulations are strong driving forces for an increased focus on sustainability for companies [2, 5, 6, and 9]. The pressure from regulatory bodies regarding sustainability will probably increase in the future. In order to meet the demands of the end-customers a company needs be proactive and do more than just follow the laws and regulations [9].

4.6 The case of Electrolux - a deep dive into the customer driving force
Including sustainability in the sourcing strategy is becoming more common. An example is Electrolux where the procurement department has developed a strategy up to 2020. This includes assessing parameters such as CO₂ footprint of the supplied materials used in production with large focus on metal, plastic and dangerous chemicals [6]. Sustainability assessment is part of the company’s mid-year reviews of suppliers [10]. The first identified step to support an increased environmental focus in procurement is assessment of share and usage of recycled materials to a higher extent. This has not been measured or noted in the procurement system in a standardized manner earlier. Additionally, discussions and actions about using materials coming from suppliers with processes that have less environmental impact are now developing, something that did not exist earlier [6]. An example of this is the company’s conversion of over 50% of purchased steel to come from scrap-based production using the EAF process which so far has reduced carbon gas emissions by over 170,000 tons [10].

To ensure the usage of sustainable suppliers, the same code of conduct is applied to both the company and the suppliers. It is a continuous dialogue where it is important to know the balance of how much pressure a company can put on their suppliers and at what time. Contracts with suppliers that do not perform or improve in a reasonable manner can be terminated or not prolonged. This is driven by increased demands on responsibility and sustainability from customers, investors and watchdog organisations and is important to work with proactively and continuously [6].
**Incentive system for sustainable purchasing**

Nonetheless, the reality is probably that the traditional procurement focus on price and quality/performance will not disappear, but environmental performance can become a dealmaker in situations of comparison of suppliers with the same offering. Price sensitivity is high in low margin businesses which cannot be forgotten [6]. Therefore there is yet no system for e.g. short term incentives in place to reward sustainability related purchasing activities. It will become more common in the future for purchasers to develop this type of system since integrated reporting and this topic is becoming increasingly important [6].

**Scope 3**

Electrolux includes scope 3 in their environmental assessment. The largest part of scope 3 (99%) is in the usage of the product for the white goods and home appliances industry, therefore the scope 3 measurement is solely focused forward in the value chain on that part. 80-85% of the product’s LCA impact is in the usage stage of the product. The understanding of the importance of scope 3 is increasing at least in the qualitative manner due to the increasing focus on the sustainability of the whole value chain [6].
PART B

4.7 The choice of EPD as an environmental assessment tool
An EPD is normally focused on assessing several environmental factors, if CO₂ is the only environmental parameter communicated it is a Carbon Footprint of a product (CFP). CFP is developed according to an ISO-standard and is focused on the process of assessing CO₂ impact, not the final result itself. Therefore it is important to note that there could arise communication problems, since the expectation of an EPD is to see the environmental impact of several different factors, not only CO₂ [5].

EPDs are hard to compare to each other since the scope is set by the companies. Therefore a Product Environmental Footprint (PEF) has been developed by the European commission, with the aim to in a clearer way decide which parameters to include when assessing the environmental impact of different materials [5]. The PEF was aimed to be a more simple assessment tool than the EPD, but showed to be much more complex. The complexity makes it difficult for smaller companies to follow all the rules, so a compulsory political force for assessing materials through e.g. PEF’s could result in many smaller companies going under. Therefore this is unlikely to happen in the future. Nonetheless, an increasing amount of companies are requiring environmental product declarations from their suppliers and it will therefore probably increase in the future. If Ovako in the future would like to change from an EPD to a PEF it will probably be done easily, since there are no real differences between them [12].

4.8 Effects of the EPD in the industry
The EPD is an initiative that will show and communicate that Ovako takes sustainability seriously and that the company is focusing on this area [1], [2]. It is a good first step toward increasing the amount of steel data that can be used in LCA’s [12] and it will most likely differentiate Ovako from its competitors [3,7]. The EPD will open the eyes of competitors and stakeholders and there might be advantages of being a first mover in this case [5], [7]. It will be a good tool for starting qualitative discussions with customers about sustainability, but it is important that the EPD is communicated and reported correctly to reach all stakeholder groups [1,6,7].

The introduction of a steel EPD could have a large effect, but it will most likely take time before the company is able to reposition as a sustainable player within their industry. Therefore direct results such as increased sales should not be expected straight away [3], [7]. Nonetheless, there are companies that have changed industries and purchasing behaviours of their customers by introducing energy declarations or LCA’s. One example is Coffee Queen, which through the introduction of energy declarations for their coffee machines influenced the industry to make it a standard requirement [12]. From an investor point of view, where CO₂ emissions are largely in focus, the EPD showing environmental performance will be beneficial for Ovako compared to ore-based manufacturers [4].

4.9 EPD - part of something larger
In order for the steel EPD to be interesting and useful for the customers, the data presented should be possible to include in their own product assessment [5,12]. Also there has to be a possibility of comparison between other competitors, implying that it would be beneficial for Ovako if their competitors also engaged in developing EPD’s [2, 9].
In order for Ovako to develop their sustainability profile the company needs to have a long-term perspective for their sustainability strategy and to be willing to invest in it. Therefore the EPD has to be a part of a larger context and other sustainability actions need to be taken [3,5]. Examples are e.g. changing to renewable energy sources and developing environmental policies [2]. The EPD is not “good enough” as a one-time initiative, but rather as a part of a complete package and a continuous process within the company’s sustainability related work and strategy [2,3,7]. This kind of initiative has to be trustworthy and must be communicated with transparency, have a clear message and be motivated in order to avoid greenwashing [3,5,9]. Using the term “green” for e.g. steel might lead to misunderstandings, therefore it could be beneficial to instead market the company as aware and active [3]. Also, in order to avoid greenwashing there has to be a transparency for what is included and not within the actual assessment. In order for the company to use this as an official communication product the assessment of an EPD should be third party certified so it becomes part of a register [5]. It is probably a good thing to benchmark against competitors to see how they communicate their sustainability work on e.g. webpages etc. [2], [9].

It is important to target not only the customers that are ready for discussions regarding sustainability, but also the right people within the suitable companies. Only attaching the EPD to invoices might not give the desirable effect since it probably will not reach the right people [6]. In order to ensure that the EPD does not only stay as a document, the salesmen need to be actively involved with Ovakos sustainability related work. Also, they have to make sure that people that are working with sustainability from the customer’s side are involved within in the actual sales process and meetings [6].
PART C

4.10 Long-term thinking and adaptation to own business
Innovation is affected by many different aspects and therefore it is important to analyze different dimensions of the internal business in order to improve sustainability work (business models, pricing, transports, recycling, effective material use etc [3]. It is important that larger organisations have an overall vision, goal and strategy for their sustainability initiatives in order for it to have a long-term impact [8]. Companies should develop long-term goals and include sustainability work in a large sense throughout the organisation so that it is seen seriously both internally and externally. If a company wants to be part of the future society, the company decisions have to show of awareness and active participation in sustainability related issues [3].

A company’s sustainability strategy should be adapted to their business to ensure that it is meaningful and easily communicated to all stakeholders [7]. Main areas of focus in the sustainability strategy should be chosen and motivated based on the industry and the company’s core business [3]. It is important to be clear on why specific initiatives are/are not initiated and to communicate it clearly in a simple way. Otherwise there might be a risk of losing the effects by making the sustainability related work too complex and by communicating too many messages at once [7]. It is highly beneficial to connect the development of a company’s products with improving environmental performance when there is such a possibility. Then there can be a strong relation between improving environmental factors and financial results, which is the best possible scenario. It is a way to easier motivate a price increase of a product within B2B markets, since increased environmental performance might not be strong enough as an argument [7].

4.11 Communication is key - results from the benchmark study
Looking at the results it can be stated that sustainability related activities and communication of these on the website is not the top priority for most engineering steel manufacturers. This goes in line with the key findings from the qualitative analysis and other research performed in this thesis.

Ovako’s main improvement areas regarding their sustainability communication on the website, where they performed below or at an average score are criteria; 3.graphics and 4.engagement. See Figure 5 for Ovakos score from the benchmark against the average value of its competitors for each criterion. The results for the benchmark per criterion can be found in Appendix II.
Exceptional performance was noted by Tata Steel that was the only company that resulted in category A with a total value of 27 for the summarized results. Tata Steel is a good benchmark engaged in numerous of sustainability related activities which are well communicated through both the main website and the website dedicated for their European operations. It is easy to find the information regarding sustainability related activities and the information is extensive. For the total performance rating of each company in the study, see Figure 6.

The resulting categorization based on total performance of each company is presented in Table 7 below. Tata Steel is the only company within the best in class category, category A. Ovako
together with Timkensteel, Gerdau and Arcelor Mittal Poland resulted in the second best performing category, category B. Saarstahl alone resulted in category C and Ascometal, Scmoltz + Bickenbach, GMH Group and Venete resulted in the worst performing category, category D.

Table 7. Sum of final score and company by category.

<table>
<thead>
<tr>
<th>Sum of final score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-32</td>
<td>A = companies whose websites are a well developed and functional channel for sustainability communication</td>
</tr>
<tr>
<td>21-26</td>
<td>B = companies that have started to develop the website to a channel for sustainability communication, but with few identified areas of improvement</td>
</tr>
<tr>
<td>15-20</td>
<td>C = companies that have started to develop the website to a channel for sustainability communication, but with many identified areas of improvement</td>
</tr>
<tr>
<td>8-14</td>
<td>D = companies that have not developed their website into a functional channel for sustainability communication with appropriate information</td>
</tr>
</tbody>
</table>
In this chapter an analysis of the results answering the research questions together with the literature study is presented, resulting in implications and recommendations for Ovako. The findings in this chapter are aimed to answer the main research question and hence fulfil the purpose of the study.

The overall disposition for recommendations to Ovako answering the main research question is presented in Table 8.

Table 8. Disposition for chapter 5 – Analysis and recommendations for Ovako.

<table>
<thead>
<tr>
<th>Implications and recommendations for Ovako</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRQ: How could Ovako continue working with their sustainability strategy in the future?</td>
</tr>
<tr>
<td>Right on time to engage in sustainability in the industry</td>
</tr>
<tr>
<td>Developing an EPD is a good first step and might become favourable in the near future</td>
</tr>
<tr>
<td>Sharpen environmental conversation about the sustainability of Ovako’s steel</td>
</tr>
<tr>
<td>Create a relatable conversation and involve others</td>
</tr>
<tr>
<td>Segment customers to kick-start the conversation</td>
</tr>
<tr>
<td>Involve the right people in the conversation</td>
</tr>
<tr>
<td>Engage in external initiatives</td>
</tr>
<tr>
<td>Make sure to communicate sustainability</td>
</tr>
<tr>
<td>Target potential partners for co-branding initiatives</td>
</tr>
</tbody>
</table>

5.1 Right on time to engage in sustainability in the industry

The results from the interviews as well as findings in the literature all point to the benefits with an increased focus on sustainability within the steel industry. Both legislative and customer driven focus on this issue shows that this is an increasingly important factor for steel manufacturing companies. Strengthening the sustainability profile as part of Ovako’s repositioning toward a sustainable company will have positive effects on all stakeholders of the company. Considering the nature of the industry and that this kind of journey is an ongoing process, it might take 5-10 years in order to see the benefits connected to all stakeholder groups. Nonetheless, it is seen as positive that Ovako is starting to build up their sustainability strategy in order to secure long-term benefits and a possible safe position when sustainability performance demands increase.

Findings show that it might take different amounts of time for stakeholder groups to acknowledge a company’s increased sustainability efforts and profile. A possible timeline of when to expect the different stakeholder groups to notice the benefits of an increasing sustainability profile at Ovako is presented in Figure 7. Findings from the interviews indicate that the ones that will notice the repositioning directly are owners and investors, since the pressure primarily comes from that direction and since there is a noticeable trend to focus on assessing sustainability performance when making investment decisions. Nonetheless, it is
needed to say that this implication is based on the currently strong global economy which could change with an economic decline.

![Timeline of benefits for Ovako’s stakeholders.](image)

**Figure 7.** Timeline of benefits for Ovako’s stakeholders.

Secondly, benefits with an increased sustainability profile will be seen among current and possible young employees. Both findings from interviews and literature show this new generation of workers cares about sustainability to a larger extent and is more keen on supporting and working for a company that shares the same values. Additionally, if targeted correctly, benefits from the right customers might be seen quite fast. This requires that customers who are ready for conversation and action regarding sustainability are reached as fast as possible (an approach of how to do this is presented further down in the chapter). Possibly this could in the beginning be European customers, since research shows that it is more common to focus on sustainability in Europe than the rest of the world. Lastly, benefits of an increased sustainability profile will be noticed by the industrial customers with a traditional approach to purchasing on price and quality of the steel and with a lower sustainability focus. This could be e.g. customers from outside of Europe where sustainability is not a factor in focus. Also, compared to the younger generation, it might take a longer time for employees from an older generation to see the benefits, but this should be further investigated.

### 5.2 Developing an EPD is a good first step

Results show that there is a noticeable frustration from industrial manufacturers of goods that purchase raw materials such as steel due to the lack of standardized ways of assessing their suppliers’ environmental impact. It is especially important for companies that have a clear sustainability strategy and focus on developing sustainable sourcing practices to be able to know how their suppliers are performing in this sense. This is important since these companies have the power to support and develop suppliers that are underperforming but have the right ambition, but also to stop purchasing from the ones that are underperforming. These industrial manufacturing companies see very positively on a standardised approach to report environmental impact, therefore Ovako’s development of an EPD is a great first step in their sustainability strategy. Also, an EPD makes it easier for Ovako’s customers to assess their Scope 3 impact connected to purchasing of raw materials and to do more accurate LCA of their products. Research shows that it is still uncommon to include Scope 3 in the overall assessment of a company’s environmental impact, but the trend is increasing.

The fact that the European Commission are involved in developing the PEF as a possible standardised way of assessing the environmental impact of materials shows that there is a political ambition to move into that direction. Even though it is unlikely that the PEF or any other environmental declaration will become a set compulsory standard in the near future, the increasing amount of customers asking for it is a good sign.
5.3 Sharpen conversation about the sustainability of Ovako’s steel

Two additional parameters are recommended to include in the conversation about the sustainability of Ovako’s steel apart from the results in the EPD, as presented in Figure 8.

The fact that Ovako’s production is scrap-based and that the companies have great capabilities in sorting their scrap reduces their need of purchasing alloys. This is mainly since scrap already contains alloys and a lower amount needs to be added to reach the same performance of the steel. Purchasing alloys contributes to environmental impact from extraction and transport and some alloys are rare. Therefore it is beneficial for Ovako to include this parameter in the conversations regarding sustainability when comparing against ore-based production.

Figure 8. Identified and recommended parameters.

Outokumpo is the only Swedish steel manufacturer that so far has developed an EPD for their stainless steel, except for construction steel manufacturers where EPDs often are a requirement in e.g. public procurement processes. The EPD is developed with a cradle-to-gate system boundary with options, including end-of-life with an assumed recycling rate. Due to the favourable recycling conditions of steel in Europe, Ovako should investigate whether a similar approach could be used and included in a development of the EPD. This could possibly be an additional environmental argument included in the discussions of environmental impact of Ovako’s steel compared to competitors from other parts of the world.

5.4 Create a relatable conversation and involve others

Results show that the main product related trends within the engineering steel industry are weight reduction and increased strength. These factors are in turn directly related to environmental impact since stronger and lighter steel contributes to a lower environmental impact in two ways:

1. Increased lifetime due to higher strength reduces need to discard and change the part
2. Lighter weight of e.g. vehicle parts reduces the total weight of vehicle which in turn decreases the vehicle’s environmental impact in terms of reduced fuel consumption and road wear

Results show that in order to make sustainability interesting for customers that primarily focus on price and performance, Ovako should clearly connect the benefits of increased product performance with increased environmental performance. Solely focusing on environmental performance in sales situations might not have the desired effect, but the message becomes clear if the customer sees benefits apart from that as well. This applies especially for customers who are not ready to pay a price premium for better environmental performance of a product.
A recommendation for Ovako is to involve others, e.g. customers, experts, researchers and regulators, in the development of their products with the focus on increasing the abovementioned product performance criteria. This way, the customers would get engaged due to the potential future benefits related to product performance. As an additional gain, this kind of initiative would drive the development toward decreased environmental impact of Ovako’s and their customer’s products. Including sustainability in this type of interactive activity would be a natural step and hence a great channel for Ovako to lift the conversation within the industry and drive their repositioning toward a sustainable company. Additionally, it would create great possibilities to receive valuable outside-in input for securing a successful development of their steel. At the end of the day, the more Ovako steel that is purchased the better for the environment, compared to many other steel manufacturers. This could be started off by hosting an event or a series of workshops and would have the benefits of showing that Ovako is taking this matter seriously and wants to see a development in the right direction within the industry.

5.5 Segment customers to kick-start the conversation

The ideal scenario is for all Ovako’s customers to engage in and support the conversation about sustainability in terms of developing conscious purchasing behaviour that includes sustainability aspects. That is the hope in the long run, but in the beginning it is good to focus on the customers with whom a dialogue regarding the EPD and sustainability of steel can have the most impact. Therefore a recommendation to Ovako is to segment their customers according to two criteria:

1. **The extent to which sustainability is valued within the company and to which the company is engaged in sustainability related activities and practices.**

   Results show that it is important to choose the customers that are ready for having and engaging in this type of conversation in order to get the wanted effect. A higher degree of sustainability focus of a company is an indicator of the possibility that the company is mature enough to engage in this matter.

2. **The share of Ovako’s steel in the company’s products.**

   One of the benefits of using Ovako’s sustainable steel in a product is the possibility to communicate that the product is responsibly developed from an environmental perspective. This increases the image and brand of a company and in turn provides benefits toward the company’s customers. Being able to state that a large share of the product is made of sustainable steel, compared to a minor detail in e.g. a motor is naturally more attractive for the customer. Therefore a higher share of Ovako’s steel in the company’s products is an indicator of the possibility of a higher interest in engaging in this matter.

   Cross-mapping these two criteria will provide an overview of the customers, product segment groups and their respective attractiveness to target in the beginning according to the priority levels, as illustrated in **Figure 9**.
The 1st priority customers are naturally the ones with a high level of sustainability focus and whose products consist of a high share of Ovako’s steel, which are identified in the top right quadrant. Since no company has unlimited amount of resources to spend, this is the primary group to target for reaching out to in order to initiate the conversations about the EPD and sustainable purchasing decisions. Secondly, companies with high performance in either of the categories should be targeted and the companies with low identified performance in both aspects are recommended to target lastly.

5.6 Involve the right people in the conversation

Once the customers are targeted and prioritized, it is important to reach the right people in the companies to convey the message about the EPD and sustainable steel purchasing decisions. Not everyone on the customer’s side is suited to engage in these conversations and decisions regarding sustainability of Ovako’s steel. Therefore a recommendation to Ovako is to make sure to have the right people in the room when engaging in this discussion with the customer. Results show that a purchaser might not be a suitable choice, whereas a senior purchaser or someone working with sustainability is more appropriate. It is not very likely that a purchaser has the power to drive/lift this topic internally.

5.7 Engage in external initiatives

Another recommendation for Ovako is to continue engaging in external initiatives related to improving sustainability of the steel industry. This would not only provide benefits of a better brand image and being taken seriously as a company that wants to drive change towards sustainability, but also have financial benefits. One example of such an initiative is to engage in the development of functioning steel recycling systems in parts of the world where there is room for improvement. This could be done by supporting organisations working with this issue, engaging politically where it is possible or partnering with scrap purchasers to drive it together. By doing so, Ovako would contribute to securing future steel scrap supply which is crucial for their business and also improve the environment by helping steel to come back into the circle. Starting to work with this issue actively is especially important now due to the newly
identified threats of originally ore-based manufacturers considering switching to scrap-based production. This type of shift in the industry might be likely to continue to some extent due to the financial and environmental benefits, although the world indeed will continue be in need of an increasing amount of ore-based production as well. It is a good way to build relationships within the industry that might become very important in the future. Apart from this example, it is recommended for Ovako to identify other parts of the steel industry’s value chain that can be improved and engage in these types of opportunities that benefit the company, the industry and the environment. Examining how Ovako could further engage in the matters mentioned above to drive sustainability within the industry and secure future business could be an interesting future study.

5.8 Make sure to communicate sustainability
The results of the study show that it is important for companies to communicate their sustainability strategy and activities in order to reap the full benefits connected to them. As the results show in the benchmark study, there is room for improvement of the communication of Ovako’s sustainability strategy and their steel’s environmental performance through the website. The recommendations for improvement areas regarding Ovako’s sustainability communication on the website found from the benchmark study are the following:

- Increase the ease of access to sustainability related information by having some of the information, e.g. performance statistics or environmental targets, available directly on the first page.

- Improve the attractiveness of the graphics making it more magnetic and communicative by e.g including more graphs, figures, pictures, interactive details to communicate quality and environmental benefits.

- Increase the level of engagement in environmental and social sustainability related activities and communicate them.

- Present the newest available sustainability performance information continuously to increase timeliness. This could be e.g. number of safety related accidents, emission levels and energy consumption levels.

- There is also room for improvement within the categories performance statistics and external assurance since the categories only could get a score of one or four. Increasing the number of sustainability performance statistics and more clearly communicating all external assurance would improve the sustainability communication even more.

5.9 Target potential partners for co-branding initiatives
One way to strengthen communication of the sustainability of Ovako’s steel is to engage in co-branding initiatives together with their customers or other externals. This was a highly interesting finding in the literature study that we recommend Ovako to look further into. A suggested example was to create a co-branding initiative with e.g. a car manufacturer to supply environmentally sustainable raw material to a vehicle with a large branding focus on sustainability. By identifying an industry and customer with similar ambitions, Ovako could initiate a conversation about how this could be shaped together to create benefits for both parties. This potential partner should preferably have a larger share of Ovako’s steel in their product in order for the initiative to make sense.
6. DISCUSSION AND FURTHER RESEARCH

This chapter presents a discussion about the results and the recommendations to Ovako. Further research areas are also incorporated and continuously presented within this chapter.

6.1 Sustainability within the steel industry

The subject of sustainability within the steel industry is highly interesting given the basic nature of the industry. It is an industry that has a large negative impact on the environment in terms of emissions, but at the same time is contributing to the development of the future society. There probably will never come a time where everyone agrees on whether the industry therefore is sustainable or not, but one thing can be stated; the awareness and engagement of all stakeholders is currently pushing the development of the industry toward being more sustainable. Nonetheless, as has been seen before, sustainability focus is often correlated with economic conditions indicating that a dip in the economy probably would have the effect of decreasing it to leave room for more of a financial survival focus. A positive aspect is that companies seem to increasingly understand that sustainability related activities can mirror in financial impact. As companies increase their knowledge about how this can be applied to a larger extent, hopefully the resistance to let go of sustainability priorities in weaker economic times will be eminent.

The view on sustainability within the steel industry depends on the reference frame used in the discussion. Interviewing people from different perspectives opened up for a more complex and interesting picture than initially thought. One view is that steel per sé can not be environmentally sustainable until the production and everything related to it reaches a zero emissions level. Another way of reasoning is that Swedish ore-based steel is more sustainable compared to ore-based steel from other parts of the world. But thirdly, Swedish ore-based steel is worse from an environmental point of view compared to Swedish scrap-based steel. Does this mean that only Swedish scrap-based steel is sustainable, or where does the “limit” of sustainability go? Can this industry ever be sustainable? This is a highly interesting topic that people probably never will agree on to a 100%. The increasing pressure on the industry is leading the development of processes and practices towards more sustainable, from that perspective compared to just 1 decade ago there is a positive development. Nonetheless, the demand for steel is increasing with the increase of population and living standards which also can be seen as a negative development from a total environmental impact point of view. A further research topic could be to investigate this balance in order to deeper dive into the dynamics of the industry.

In Sweden and the Nordics sustainability is overall a topic in focus more than in many other parts of the world. Regional and cultural differences affect how sustainability is valued, therefore it is important to understand that this topic will not get the same attention even when communicated well. Until the topic gets even more attention, the possibility to take a price premium on steel related to sustainability performance could still be questioned. Slowly, but steady the world is moving in that direction due to global warming, but the question remains as to when it will become reality.

Probably as in many other industries, sustainability within the steel industry is tricky since it is hard to measure. Apart from e.g. specific energy savings initiatives, sustainability is connected to long-term goals with immaterial advantages connected to increased brand image, reputation etc. Therefore it is hard to forecast the results before engaging in sustainability related
activities, which can make it hard for companies to e.g. motivate investments. This could be partly the reason to why it is still uncommon for purchasing incentive systems to be based on sustainability performance to some extent. Perhaps, what is required for a steel company to benefit from environmental performance of their products and processes is to translate it to the corresponding financial worth it brings. This could be an interesting topic for further research - investigating how the sustainability performance of scrap-based steel could be translated into financial gains for the customer.

6.2 Environmental data within the steel industry
Results in the study show that there is lack of data related to the environmental performance of steel. Comparing to other materials in e.g. a car, it is hard to include accurate data in LCA’s which are becoming increasingly common. Since LCA’s are a way for manufacturing companies to increase transparency of their products and transparency is becoming increasingly important, it will hopefully not be good enough with average data in the near future. It is possible to think that the increasing demands for transparency will get goods manufacturers to put larger pressure on steel manufacturers and industry organisations to present relevant and accurate data connected to the purchasing choices they make. Hopefully, this will drive an increase in steel manufacturers developing EPDs or other similar declarations in order to truly make the steel industry and its differences transparent.

This is a complex issue since industry organisations naturally want to protect and take care of all its members. An increased transparency and a more accurate environmental performance picture throughout the world would directly disbenefit some members. These could be members from regions in the world with no access to renewable energy sources, or who have an iron-based steel production. Here it almost becomes a political matter - should these members directly get a disadvantage due to their performance data, or should there be exception rules applied since they also are needed to support the pace of development in the world?

6.3 Scrap-based steel VS ore-based steel
The study showed that the process for the scrap-based production has a lower total cost, requires less energy and contributes with less CO₂ emissions compared to ore-based production. Hence, it is possible to claim that there are large environmental benefits with a scrap-based production compared to an ore-based production, without it having any negative effects for the capacity and quality of the final product. The future demand for steel will continue increasing due to rising population, increasing global economy and living standards. This together with the fact that recycling systems for scrap are yet not established in many parts of the world will challenge the possibilities for only having scrap-based steel production. The demand will most likely be too high to be met by only using recycled scrap and there are risks for large variation in scrap prices. Hence, the world is still dependent on ore-based production and will probably continue to be for quite a while. This results in a dilemma between what is the most environmental friendly and cheapest way of producing steel and how to produce steel in order to meet future demands. This could be an interesting topic for future research - to investigate the possibility to satisfy an increased demand of steel by scrap-based steel production. Also the study found that, from a global perspective, it is beneficial to perform mining of iron ore and perform ore-based steel in Sweden in comparison to most other places in world. This is due to the high quality of the iron ore and due to the large access of renewable or partly renewable energy. It is not possible to pick-and-place where certain industries should be located in order to optimize the use of our global geographical resources. However, one could argue from a global perspective, that in order to meet the future steel demand and decrease
the amount of CO$_2$ emissions, more iron ore mining and ore-based steel production should be placed in Sweden instead of in e.g. China.

6.4 Digital sustainability communication
Digital communication is a powerful tool for reaching out with information to different stakeholders and to both show and communicate transparency. Being transparent is a powerful thing and the study has shown that the digital age has changed the level of trust and transparency that is expected from corporate organizations. Also it was found that transparency is an essential component for building trust with customers, investors and in order to strengthen the company brand. When communicating sustainability related activities, transparency is exceptionally important to avoid greenwashing and therefore this kind of communication has to be trustworthy and needs to be motivated without creating misunderstandings. Looking at the results from the benchmark study it was found that communicating sustainability strategy and activities through websites are not a top priority for many steel manufacturers. As the focus on sustainability will continue to increase in the future we argue that this is a central and increasingly important aspect to consider for Ovako.

6.5 Sustainability - an increased focus among investors
Historically sustainability has not been a major focus for investors, especially not for industries like the steel industry. However, the study has shown that sustainability has become increasingly important from an investor perspective as there are large risks associated with sustainability work such as large emissions, accidents and low ESG ranking. The steel industry is naturally not associated with being a “green” industry due to its large emissions and energy intensity. Increased focus on sustainability in the form of increased demands and stricter regulations for e.g. emissions could therefore be seen a risk for the steel industry as this could result in expensive investments and/or penalties. However, the European steel manufacturers today have far more legislative demands and regulations for how to operate in comparison to manufacturers in e.g. Asia. This means that probably most of the European companies have invested in sustainability related upgrades and/or are in the process of making these types of investments. Therefore it could be argued from a long-term global perspective that European companies could have large benefit in the future as similar demands and regulations most likely will be forced upon companies in other parts of the world. As sustainability often is associated with long-term financial benefits it could be interesting to further investigate how sustainability investments today could pay off in the future parallel to the expected increased focus in sustainability.
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46


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### APPENDIX I - Themes for semi-structured interviews for each stakeholder group

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<th>Experts</th>
<th>Customers*</th>
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*Note: the interviewees within the customer stakeholder group are not direct customers to Ovako. The stakeholder group is represented by people with large experience and insight within steel sourcing and procurement.*
## APPENDIX II - Scores by criterion from benchmark study

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*1. ease of access to information, 2. ease of navigation, 3. graphics, 4. engagement, 5. timeliness, 6. completeness, 7. performance statistics, and 8. external assurance