RINGNES
Part of the Carlsberg Group

Environmental Sustainability Efforts at Ringnes:

An Analysis of Ringnes' Distribution Operations in Norway

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Abstract

With increasing global attention on environmental impact, the sustainability efforts of firms are becoming of increasing importance for all stakeholders. Along with changing regulations, technologies, and business operations, such efforts need to be continually examined and assessed for improvement. This paper examines the sustainability efforts of a large Norwegian firm, Ringnes, and assesses their distribution operations. It is essential to learn what kinds of external and internal factors impact these efforts, and what kinds of solutions are available to further them.

Our research expands on Ringnes' current efforts by analysing their sustainability reporting process and results. To conduct our study and examine these important aspects, we have gathered a significant amount of data ourselves, including conducting a three-round questionnaire and two interviews with employees at Ringnes. The results of this illuminated five key challenges: poor infrastructure, lack of investment, lack of alternative transportation, old or underdeveloped technologies, and inefficient route planning or logistics. By examining the interplay of the external and internal factors, and in building upon essential theories and concepts such as the possibility of win-win situations as described by the Porter hypothesis, we offer insight into how Ringnes can further their sustainable transition and improve their sustainability efforts to overcome these challenges.

Acknowledgements

The paper was written as a group for the Environmental Management and Sustainability Reporting graduate course at the Norwegian University of Life Sciences. Our project has assessed the sustainability efforts within the distribution operations at Ringnes, and as such we were motivated by being able to work closely Ringnes to learn how they are prioritising environmental challenges, developing strategies, measuring progress, identifying challenges, and working towards solutions to become a more sustainable business.

We would like to acknowledge the help of several key individuals who made this project not only possible, but a truly meaningful and enriching learning process for each of us. First, we would like to thank our supervisor Ståle Navrud for his guidance and efforts so we could complete this paper, as well as for allowing us this opportunity and coordinating our first meeting with Ringnes. His constructive feedback has been very helpful during both the planning and development of our project.

Next, are the individuals at Ringnes, who contributed valuable information and helped us to carry out our research and complete our assignment. Mr. Nicolay Bruusgaard, Mr. Sondov Øystese, and Mr. Einar Gundersen were instrumental in this project, and we want to thank them for being so readily available throughout this process, as well as for being welcoming and eager to help us succeed. We also want to thank all the individuals who responded to our many questionnaire rounds, including the managers who agreed to be on our expert panel, as well the anonymous employees that each provided essential data for our study. We greatly appreciate everyone at Ringnes for being so enthusiastic about our efforts and hope to have provided an interesting and exciting study that can offer genuine suggestions for furthering the essential efforts being made towards a sustainable transition at Ringnes.

Table of Contents

1. Introduction

1.1. Problem Statement

The Norwegian society places value on a clean environment and the government encourages businesses operating in Norway to not only be aware of their negative environmental impacts but also to take active steps to reduce it (Steenstrup Stordrange, n. d). Since its establishment in 1877, Ringnes has grown into Norway's largest brewing company and as such is an important actor in terms of its environmental impact (Ringnes, n.d.). Ringnes contributes to achieving a cleaner environment by prioritising environmental issues, making efforts to reduce their carbon footprint, and demonstrating transparency by engaging in sustainability reporting.

An essential component of many business operations is the distribution of goods, yet this is also one of the most challenging areas for firms in terms of environmental impact. This is due to the fact that such operations can produce high levels of harmful emissions. Examining the activities, processes, technologies, and investments relating to a firm's distribution operations can grant essential insight into the impacts of the firm, as well as illuminate aspects of operations that can be adapted to become more sustainable.

As a large distributor in Norway, many factors influence Ringnes' environmental impact. What they prioritise and set as targets effects what kinds of efforts are made, how operations are conducted, and what technologies are invested in. By discovering the current and planned sustainability efforts at Ringnes, and the external and internal factors that impact those efforts, it can allow for a greater understanding on the progress being made and the strategic solutions available for further reducing their environmental impact.

1.2. Research Questions

The aim of this paper is thus to examine the sustainability transition within Ringnes' distribution operations. We will do this by exploring three central research questions:

RQ 1) What external factors might impact the sustainability efforts within distribution at Ringnes?

RQ 2) What internal factors might impact the sustainability efforts within distribution at Ringnes?

RQ 3) What are some possible solutions to improve the sustainability efforts within distribution at Ringnes?

To answer these questions, we will draw upon data we have collected ourselves, expert testimony, academic literature, and industry reports. In addition to answering these questions, we also place a critical focus on the sustainability reporting process and result at Ringnes and offer ways that this can be improved throughout the paper.

1.3. Structure of Paper

Following this introductory chapter, we establish the context of our paper in Chapter 2, by providing a brief background on Ringnes as a firm. The main purpose of this chapter is to establish our baseline; to understand what the previous and current sustainability efforts at Ringnes are. Chapter 3 will build the conceptual and theoretical foundation necessary for the paper, including what terms such as sustainability, corporate social responsibility, and non-financial disclosure mean in theory and in practice, and what their role and importance in a firm are.

Chapter 4 then explains the methodological approaches used in this study. Here, we discuss the data collection process, including our three-round questionnaire, which surveyed managers as well as the wider employee base at Ringnes. We also include details on the two interviews we conducted with Ringnes employees, one for uncovering important background information and one in order to gain expert insight into challenges and solutions towards Ringnes' sustainability efforts. In this chapter, we also include the rationale behind each of our decisions, and what impacts these choices may have had on the reliability and validity of our data, as well as the limitations they may have created for our study. Finally, we discuss the steps we took to ensure our data was collected and analysed according to high ethical standards and that the right to confidentiality for our participants was ensured.

In Chapter 5, we simply present our analysis and findings of the data we collected, in order to build further upon them. In Chapter 6, we present our discussion, where we draw our theories and data together to examine and answer our research questions. RQ1 is discussed through the regulatory, technological, and infrastructural external factors and their impact on Ringnes' sustainability efforts. RQ2 is then discussed through the internal organisational, financial, and logistical factors that also impact these efforts. We finish the chapter with examining RQ3, where we discuss some specific solutions to the various challenges to Ringnes' sustainability efforts in its distribution operations as identified throughout our study.

In Chapter 7, we include brief comments related to the significance of this study to Ringnes and some recommendations on how Ringnes can improve their sustainability reporting efforts via improved targets, measuring, and what material is included in the report itself. Finally, we conclude with Chapter 8, where we offer a summary of the important points in our study as well as some additional ways to continue this research.

All further details from our research study can be found in the included Appendix.

2. Context

2.1. Ringnes: In Brief

Despite many changes in the industry, economic recessions, and new advancements in technology, Ringnes employs over 1,000 employees in Norway today. They have four production sites, the largest of which is the factory at Gjelleråsen located in Nittedal. In addition to being a brewing company, they produce popular soft drinks such as Solo, and are the distributor of Pepsi and Pepsi-Max for the country. They also produce sparkling mineral water from Farris and bottled water from Imsdal in Norway. In 2004, Ringnes was acquired by the Carlsberg Group, a global brand for beverage production and distribution. Thus, despite being focused locally in Norway, international internal and external forces have a role in even the daily operations and priorities of the firm.

2.2. Emissions from Distribution

Ringnes is concerned about the total emissions of their products throughout the entire life-cycle, and as such they take responsibility for the environmental impacts of their entire value-chain. This naturally includes actors and factors that operate outside Ringnes and the greater Carlsberg Group (Ringnes, n. d). While Ringnes considers their carbon footprint for their whole value chain, as well as the entire life-cycle of their products, this paper focuses solely on the environmental impact from their distribution operations, as shown below in Figure 1.1.

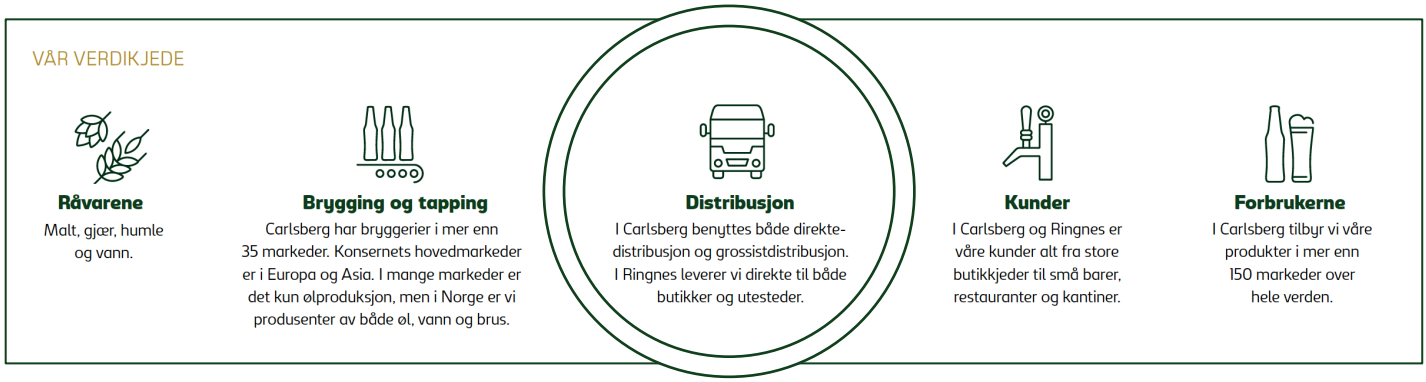

Figure 1.1: Ringnes' value chain (Ringnes, 2018*)*

Distribution is an important part of the life-cycle of a product because it has the possibility to drastically increase overall emissions. While Ringnes is comprised of both commercial and distribution enterprises, they take responsibility for any transportation that they themselves do not take part in. To do this effectively, Ringnes uses freight transport by train whenever possible to distribute their goods, as well as cooperates with local third-party distributors, for certain

local distributions. In fact, the development of partnerships with thirty suppliers has been planned in order to reduce their overall carbon footprint (ibid).

While Ringnes uses rail and sea freight transport as much as possible, much of their distribution operations in Norway are via road using heavy trucks. These trucks can be damaging to the environment due to pollutants emitted during vehicle operation as well as from the fuel combustion itself. The major pollutants from motor vehicles that can contribute to environmental degradation and are associated with human health problems are; particular matter (PM), volatile organic compounds (VOCs), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2) and greenhouse gases (UCS, 2019). Yet these are not always straightforward. Air pollution for example, can be split into primary pollution: being emitted directly into the atmosphere by an emitter, and secondary pollution: the chemical reactions between different pollutants in the air.

Pollutants from vehicle exhaust for example, can contribute to the collective emissions of global warming gases in the atmosphere, which may further climate change such as by exacerbating sea level rise, floods, and drought (Leman, 2018). These pollutants also pose risks to the human health, such as through fine particles that can affect the lung and respiratory systems. They also have other kinds of harmful emissions, such as being a source of noise for local communities. They also add to the growing problem of microplastics, as a recent study found that as much as 89% of small particles resulting in microplastics in the air came from vehicle tires and brake pads (ibid).

2.3. Environmental Reporting and Management

Prior to 2015, Carlsberg was reporting on their social responsibilities as a firm, but beginning in 2015, they began focusing these efforts towards a greater sustainable transition. In 2016, Ringnes followed suit by producing their first sustainability report. Both Ringnes and Carlsberg have contributed with new reports in the years since. Then in 2017, Ringnes and Carlsberg launched their sustainability strategy “Four times zero” which consists of four main focus areas as shown below, which aim to promote a safer company culture and to ensure a healthier use of their products (Ringnes, n.d):

ZERO carbon footprint	ZERO water waste	ZERO irresponsible drinking	ZERO accident-culture

These ambitions set the priorities for the years to come, with specific targets decided upon in order to reach each of these focus areas by 2020, 2022, and 2030.

As this paper focuses on the environmental part of Ringnes' sustainability efforts, we have chosen to focus only on the ZERO carbon footprint goal. To achieve this collective goal, Ringnes has set targets to reduce the carbon footprint of their operations by 50% by 2022 and to become carbon neutral by 2030. They plan to achieve this by using renewable energy sources as well as by reducing their general energy waste and consumption (ibid). Ringnes' environmental management process has been certified according to ISO 14001, which illustrates their desire to engage in environmental responsibility (ibid). To meet these targets, there are several specific efforts that are made within Ringnes' distribution operations in order to reach the collective overall goal of a zero-carbon footprint.

The first is to reduce their fuel usage. Operations from distribution create about 14% of the carbon footprint of the value chain, which Carlsberg describes as being all the way from "beer to hand" (Carlsberg, 2017). Ringnes aims to reduce this 'beer to hand' carbon footprint by 15% by 2022 and by 30% by 2030. So far, the reductions made towards this target have been quite low. The reductions made from 2015 to 2016 was just 5.6% and in 2017 the usage stayed at the same level (Ringnes, 2018). Unfortunately, no reliable data is available to see their total emissions due to system changes (E. Gundersen, personal communication, May 07, 2019; Appendix 10.4.4). The only information available is that in 2018, Ringnes estimates that 4.5 million kilometers were driven, averaging 34.50 litres per 100 km for fuel consumption (ibid).

A second important effort Ringnes has made was their 2017 investment in upgrading 28 trucks out of 130 to the lower emission Euro VI engines, with the goal to upgrade all trucks by 2020 (Ringnes, 2018). Though not carbon, this new technology allows for a huge reduction in NOx and PM emissions and improves the situation for the local community by increasing the quality of the air. As a result, trucks with these engines are prioritised for use in urban areas like the capital city of Oslo, which are most vulnerable to this type of pollution. While we mentioned above that Ringnes did not see any reduction in diesel consumption from 2016 to 2017, they plan to see a difference in the years to come as they implement these new low-emission trucks (ibid). In addition, in 2018, Ringnes implemented new technology which allows them to load their trucks more efficiently. A truck's goods capacity is then doubled, which means they can maximise route planning by being able to deliver twice the amount of goods in a single trip and cover a larger area (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4)

This brings us to a third effort, which relates to Ringnes' driver training and planning of distributions. Drivers working for Ringnes must go through a mandatory training on environmentally-friendly driving and are continually assessed on their driving habits as it

relates to harsh braking, green band driving, combined coasting and overspeed (E. Gundersen, personal communication, May 07, 2019; Appendix 10.4.4). Each of these categories are Key Performance Indicators (KPIs), which are measurements that allow Ringnes to continually understand their efforts and see if such training is working. Ringnes also has a department that includes dedicated route planners, who continuously search for the most efficient routes that the distribution cars and trucks should follow when delivering goods. These routes are determined based on an assessment of important information such as current traffic delays or road work, and uses software to help the routes be as efficient as possible.

Ultimately, through all these efforts on environmental management and their subsequent reporting, Ringnes is able to develop an understanding of their environmental impact and make further efforts to reduce it.

3. Theoretical Framework

3.1. Porter Hypothesis

The notion that strict public environmental policies implies private and business costs and would harm the competitiveness of an industry in a country, was challenged by Michael Porter's hypothesis. The American economist responsible for the theory, Michael Porter, introduced this hypothesis in an article from 1995, where he suggested that a well-designed and stringent public environmental policy in the form of economic incentives can stimulate innovation in a firm. This may eventually increase the firm's competitiveness, as well as outweigh the short-run private costs of the regulation (Van Leeuwen & Mohnen, 2017).

This hypothesis suggests a win-win situation where environmental regulation can improve both the environment in local communities as well as the competitiveness of a firm (Xepapadeas & De Zeeuw, 1999). The Porter hypothesis gained significant attention, as well as criticism, because conventional wisdom based on standard economic models suggested the opposite effect (Qiu, Mohan & Wei, 2018). Porter's hypothesis and the very notion of a possible win-win scenario was however widely welcomed by policy-makers, because it meant they no longer had to decide on the difficult trade-offs between environmental and economic targets (Xepapadeas & De Zeeuw, 1999).

Since 1995, a large number of case studies have supported Porter's hypothesis and have confirmed that firms under strict environmental regulation have proven to be more successful (ibid). In a recent review of a newer article from Porter and Kramer (2006), Borglund, De Geer, and Sweet (2017) argue that it is possible to find a win-win scenario in many aspects of business

with and without external regulations. For example, between a firm and the stakeholders, a win-win situation can be found when a firm enacts its social responsibility by addressing the firm's specific impact on the stakeholder whilst still meeting needs of the shareholders.

3.2. CSR & Sustainability Reporting

In Norway, there are regulations that firms must abide by as well as greater goals set by public policy that firms must contribute to reaching. Yet in the absence of stricter regulation or with a firm's desire to go beyond government regulation, the notion of corporate social responsibility (CSR) or sustainable business is becoming an increasingly important one. CSR involves the responsibility an enterprise assumes for different components of society (Borglund, De Geer, and Sweet, 2017). At its core, the concept of sustainability relates to the future and describes the means in which people "use and interact with various natural resources and ecosystems" (ibid:78) so that they are not degraded and are available for future use. The term sustainable business refers to a firm's strategy, commitments and efforts to do business in-line with this vision.

In practice, this often resembles a firm that has concern over their environmental, social, and governance impacts (ESG) and how these impacts affect their stakeholders and eventually their reputation and financial gains. In Norway, all firms are ascribed some level of responsibility for their impacts and the issue has instead become a question of how to hold a firm accountable (Steenstrup Stordrange, n. d). Born out of this need was the option for a firm to report on their non-financial responsibilities and demonstrate progress towards reducing negative impacts. In this way, firms can communicate their actions towards a sustainable transition, while being transparent and building legitimacy and trust (Borglund, De Geer, and Sweet, 2017). Essentially, sustainability reporting becomes a tool to gather data on a firm's environmental impact, establish their values, and set strategic goals as a company to reduce their negative impacts. The disclosure of the non-financial actions of a firm allows for this important information to be made available to shareholders as well as the wider group of a firm's stakeholders.

"Sustainability disclosure can serve as a differentiator in competitive industries and foster investor confidence, trust and employee loyalty. Analysts often consider a company's sustainability disclosures in their assessment of management quality and efficiency, and reporting may provide firms better access to capital" (Tamimi & Sebastianelli, 2017:1661). Recently, more and more firms have started to realize that their corporate governance,

environmental efforts and ethical social practices are increasingly affecting their business as these are becoming of increasing importance to a wider variety of stakeholders (Tamimi & Sebastianelli, 2017). Firms are now, to a much larger degree, measuring and reporting on their sustainability activities.

As alluded to, this builds largely upon stakeholder theory, which is one of the most used theories for explaining disclosures of CSR and ESG. It focuses on the important relationship between a firm and its stakeholders, and is therefore a key framework in assessing CSR reporting (ibid). The thinking here shifted over time, and now a firm's success has more to do with creating value of all types for the larger groups of stakeholders rather than solely creating wealth for its shareholders.

In fact, ignorance of the well-being and interests of a firm's wider groups of stakeholders can be damaging and hinder its success and achievements. CSR disclosure is often used by firms as a strategy to show their interests in the stakeholders' concerns, motivated by creating a good reputation for themselves (ibid). Thus, what a firm chooses to include, exclude, and highlight in their reports can be of great importance and can reflect the priorities and interests of the company (Székely & vom Brocke, 2017). In Norway and the EU, there are minimum legal requirements for disclosing certain impacts, but beyond this, there are no strict requirements despite the slow but steady push for the standardisation of reporting and metrics (Borglund, De Geer, and Sweet, 2017).

While not specific, an important globally-accepted standard was developed was in the year of 2015, when the UN agreed on 17 ambitious and universal goals, called the Sustainable Development Goals (SDGs). In order to meet the urgent environmental, economic and political challenges across the world (UNDP, n. d), these goals were set to build on and succeed the Millennium Development Goals from 2000. The SDGs include new areas addressing issues such as climate change, disaster risk, sustainable consumption, peace and justice, among many others (ibid).

The SDGs came into effect January 2016, and following this, governments, civil society, and businesses have been urged to take an active role in helping to reach these goals by incorporating them as a basis for their own strategies and operations. Thus, firms can use these as general standards to contribute to, by setting their own targets to reduce their emissions and work towards a sustainable transition (ibid). To further this, numerous international standards for contributing to each of the global goals have been developed (ISO, n. d). Firms, governments and civil society have realized that achieving the SDGs is an essential win-win

for the planet, in that they build a more sustainable future where business can take advantage new opportunities that do not damage current and following generations' rights (UNDP, n. d).

According to the ISO (n. d), internalized standardization is a helpful tool to meet the UN's Sustainable Development Goals as they are large goals that no single company can achieve (but rather contribute to). Unfortunately, without strong standards and metrics for what to report on and how to measure progress, sustainability reporting can simply become an exercise in communicating achievements, or in presenting manipulated data to appear more environmentally-friendly then a firm actually is. Such a practice is called greenwashing, whereby a firm withholds or manipulates important data relating to their negative impacts in order to give a positive impression to their stakeholders (Aggarwal and Kadyan, 2011).

3.3. Environmental Management

An important basis for reporting is a firm's engagement in environmental management. The International Organization for Standardization (ISO), for example, provides international standards for businesses to ensure that their products and services are safe, reliable and of good quality. These standards are strategic and useful tools for reducing a firm's costs by minimizing errors and waste and increasing productivity (ISO, n. d). Businesses can gain further trust and credibility when being externally audited and meeting such standards. The ISO14001 for environmental management has gained increasing attention among businesses, where many firms are evaluating whether to get certified or not. This standard requires assessments such as life-cycle analyses and environmental performance to be externally audited (Bansal & Bogner, 2002). Such certification can be extremely good for the image of the firm, demonstrate the thoughtful reflection and subsequent action on the stakeholders' interests, and verify that a firm is aware of and managing its environmental impacts (ibid). The clearest economic benefit may be the ability to sell goods to customers requiring ISO14001 as part of their value-chain.

It may also be a factor in terms of competitiveness, such as by being behind rivals who are certified, as well as from customers and other stakeholders demonstrating a desire for the firm to be certified (ibid). There are also institutional pressures that can provide reasons to get ISO14001 certified. Unlike economic pressures, which can enhance the performance of the firm, institutional pressures protect the firm through acquiring legitimacy in their area of operation and include scrutiny from concerned interest groups. Finally, it can relate to trust, as it may raise suspicion about a firm's practices if they do not get certified, especially when others in similar businesses or within the same industry are doing so (Bansal & Bogner, 2002).

4. Methodology

4.1. Preliminary Data Gathering

To explain the methodological approaches used to complete this study, we being with our preliminary data. This was gathered to understand the context of our study and to create our research design. First, this included an overall assessment of Ringnes, which aimed to examine what the previous and current sustainability efforts at Ringnes are, as was discussed in our background chapter. Second, utilising the sustainability report from Ringnes, we were able to identify several key areas of interest that could warrant further exploration in our study. Third, we engaged in a call using the Skype platform to establish some of the basic of information and discover the possibility of collaborating with Ringnes on this project. Finally, we attended a meeting at the Gjelleråsen factory with several representatives of Ringnes.

From this, we gained in-depth insight into the operations of Ringnes and the challenges faced for improving sustainability. The result of this preliminary data gathering was a scope for our study: distribution at Ringnes, and a focus for our research inquiry: what factors impact sustainability efforts at Ringnes and what are some challenges and solutions?

4.2. Data Collection

The data used in our study involved both secondary data that was retrieved from other researchers, experts, and writers, as well as primary data that we collected ourselves. Among the secondary data were industry reports from Ringnes, the parent company the Carlsberg Group. We also drew upon academic literature necessary for understanding the theoretical underpinnings and creating a strong conceptual and theoretical foundation for the paper as a whole. Finally, we drew on relevant economic and scientific data regarding technology. This data was selected only when we considered it to be from a trustworthy source for academic purposes, and tried wherever possible to verify the information.

As for the data we collected ourselves, we used a qualitative approach. Our population was aimed at encompassing all of Ringnes across Norway, however with the convenience sampling approach we used, our selection appeared to almost exclusively include employees at the Oslo/Gjelleråsen area. The consequences of this will be elaborated on further in 4.4.

4.2.1. Questionnaires

One of the methods we used for our data collection was a qualitative surveying approach via a questionnaire that closely resembled the Delphi method. Rooted in forecasting, this method

uses expert consultation, or a panel of experts, who come to a conclusion about an often uncertain subject area. The aim of the Delphi method is to make use of an iterative process, where experts can respond in one round, but continually revisit their assumptions based on the aggregate opinions of the group and change their answers in subsequent rounds. The result is insight into the opinions of the experts that have been made reliable through this iterative process, as the findings have been checked against the expert them self as well as the expert group as a whole.

With this approach in mind, our aim was to make the most use of our resources, both in terms of time but also through Ringnes' agreement to take part in our study. We constructed a questionnaire that had three rounds. The first two rounds would resemble the Delphi method, allowing for the expert consultation through a chance to present an opinion and a second chance to revise it upon learning the aggregate opinions of the other experts. Upon learning a narrowed down set of expert findings, we would then open up the questionnaire to include not just the experts (who could again vote), but to all employees at Ringnes. We provided the questionnaire in both English and Norwegian, and participants could respond in either language. Specifically, each round of the questionnaire was done online using the Google Forms platform. Below is a step-by-step explanation of the process we took to achieve the results that will be discussed further in Chapter 5.

Determine the Expert Group (panel of experts)

a. We approached Ringnes with the details of the study and they agreed to take part. For Round One, they disseminated the electronic link to the online questionnaire internally, and was addressed to all managers.

b. We explained in our questionnaire material (see Appendix 10.1 for details) that any manager who responded to Round One would become part of our expert panel and thus needed to commit to responding in Round Two as well.

Conduct Questionnaire Round One (R1)

a. R1 first included gathering identifying information: full name, email address, and position at Ringnes. Next, we posed the question: "What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please include five or more." For the exact questionnaire, see Appendix 10.1.3.

b. These qualitative responses were then compiled into a categorical list of the responses to be used in R2. For specific details on the analysis see 4.3. and 5.1.

Conduct Questionnaire Round Two (R2)

a. We sent the electronic link to R2 online questionnaire via email directly to the five participants who responded in R1.

b. R2 first included gathering identifying information: full name. This was for the purpose of confirming the identity of the experts and ensuring it was the same participants responding in both rounds. Next, we posed the question: "What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please select exactly four from the categories below." To see the exact questionnaire, see Appendix 10.2.3

c. The five categories that received the most responses were then compiled into a list to be used in R3. For specific details on the analysis see 4.3. and 5.2.

Conduct Questionnaire Round Three (R3)

a. We approached Ringnes with the details of the next part of the study and they agreed again to take part. For Round Three, they disseminated the electronic link to the online questionnaire internally, and was addressed to all employees.

b. R3 gathered no personally identifying information. We only asked: "What do you perceive as the biggest challenge to improving sustainability in transportation/ distribution at Ringnes? Please select only one from the categories below."

c. Each vote was then counted. For specific details on the analysis see 4.3. and 5.3.

4.2.2. Interviews

Background Interview

Our data collection also involved an email 'interview' where we presented a list of questions that inquired about important background information, the answers to which were not publicly available. This was done via email to a contact at Ringnes, who provided us with an additional contact who could respond to our inquiry, and thus followed a snowball sampling method. In the end, Mr. Einar Gundersen, the National Transport and Distribution Manager at Ringnes, responded in writing to the following questions:

"1. How many trucks does Ringnes have in total?

2. For 2016, 2017, and 2018 (if available): what are the emissions from transport/distribution, as well as the total emissions from Ringnes? Could you also please elaborate on the total distance driven (page 15 of the sustainability report)?

3. Could you elaborate briefly on the relationship of Ringnes to Carlsberg (specifically on things like priority setting or the level of autonomy from Ringnes has to make its own decisions for things like sustainability goals and to track its own progress etc.
4. What is the rationale for not using electric trucks/vans for inner city delivery?
5. What are the KPIs for drivers/sustainability training? What kind of training is this and is it given regularly? Is there follow-up or progress tracked in some way?"

Expert Interview

Next, we engaged in an 'expert interview' whereby we conducted a semi-structured interview with one of the experts at Ringnes that did not participate in the questionnaire. This was done via a telephone call, which was recorded. Mr. Sondov Øystese, Director of Logistics at Ringnes, was selected because of his expert position to our topic. We asked him the following questions:

"What do you believe are some possible solutions or approaches to address each of the five challenges listed below? You can be as general or detailed as you like, and can answer in English or Norwegian.
Q1. Lack of investment or cutting costs (i.e. into new technology/processes)
Q2. Lack of alternative transportation (i.e. train or other supplementary transportation)
Q3. Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Q4. Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Q5. Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)"

4.3. Data Analysis

4.3.1. Questionnaires

As discussed in the collection phase, the data we gathered involved several rounds of questionnaire, and thus also involved an analysis after each round.

Analyse Questionnaire Round One (R1)

For R1, we analysed each response we received by compiling them into a categorical list. Some responses could become a category in themselves, while others required more interpretation on our behalf as researchers. Additionally, it was not always clear what the participant was trying to say, and thus involved even further interpretation. We examined each response thoroughly and assigned it a category to the best of our ability. Responses that were similar were grouped. Our findings are detailed further in 5.1., but

for the exact responses from each participant as well as for which category it was coded it as, please refer to Appendix 10.1.4.

Analyse Questionnaire Round Two (R2)

The responses for R2 were more straightforward to analyse because we could simply count the number of votes given to each category. Our findings are detailed further in 5.2. Given that each participant voted four times, please refer to Appendix 10.2.4. to specially examine how each participant allocated their votes.

Analyse Questionnaire Round Three (R3)

Responses for R3 were also straightforward to analyse because we could also count the number of votes. In total there were 22 participants, and the results of their voting are detailed in 5.3.

4.3.2. Interviews

Background Interview

The responses given by Mr. Gundersen are interwoven throughout our paper. We refer to this background interview as a source and as such provide the full and exact responses in Appendix 10.4.4. This means that we do not analyse the data as such, but rather use it as a reference.

Expert Interview

Similarly, the responses given by Mr. Øystese are included where relevant into the text of our paper. We refer to this expert interview as a source and as such provide the full and exact responses in Appendix 10.5.4. This means that we do not analyse the response data, but rather use it as a reference in our, particularly in 6.3.

4.4. Research Integrity

4.4.1. Reliability and Validity

Reliability and validity are important aspects to justify why the results of a study can be used. In this study, one key issue relating to reliability is that participants may have interpreted questions differently. Indeed, during Round One, we have concern that one of our participants did misinterpret the primary question (see Appendix 10.1.4, Participant D). However, an important thing to keep in mind, is that the use of the Delphi method gives participants the

opportunity to revise their opinions given in previous rounds. The nature of this process can naturally enhance the reliability of the responses given by the participants.

In regards to validity, there are several important issues in our study that we aim to be transparent about. First, we did not use a professional translator for any of information despite moving in-between Norwegian and English regularly. As the research team participating in this project, while we had one native English speaker and two native Norwegian speakers, there is no guarantee that our translations have been perfect. Given the qualitative nature of this questionnaire, this has important consequences for the interpretation and understanding of word usage and phrase meaning, particularly during Round One.

Second, we need to highlight some additional potential flaws in the structure of our questionnaire in Round Two and Three. In Round Two, there is no option for participants to rescind their votes or select something new (i.e. change their mind to an alternative not given). Furthermore, participants were forced to select exactly four options. This means that while it may have been helpful in prioritising, participants may also have selected options they did not believe to be challenges for the sake of completing the questionnaire.

Similarly, during Round Three, participants were not given an option to enter in an alternative of their own choosing, nor select that they did not agree with any of the alternatives given. In hindsight, these issues could have been addressed by adding in an option to rank instead of simply select, and to give an option to 'create an new alternative' and an option to 'select none of the above'. Overall, the greatest consequence of this is that the validity of our data is unknown, as this may have caused a bias towards the data from Round One without giving an option to gain new insights or to show the opinions of those who disagree. This has also introduced limitations to our study, as will be discussed in 4.4.3.

Third, as alluded to in the beginning of 4.2., we aimed to use as representative of a sample as we could using all of Ringnes as our population. However due to our main approach being of convenience sampling, where we make use of those individuals who are readily available to us, we believe that our data has been skewed towards almost only data from employees in the Oslo and Gjelleråsen areas. Furthermore, because of this qualitative approach, we cannot extrapolate or generalise our findings as being representative of Ringnes as a whole. We also present this as a limitation in 4.4.3.

4.4.2. Ethics and Confidentiality

During all aspects of our data collection and analysis we aimed to demonstrate an ethical responsibility as researchers to our participants. We closely followed the Norwegian National

Research Ethics Committee's Guidelines (NESH, 2016) on several key points, such as giving participants information on how their data will be used in the study, how it will be stored, providing participants the option to opt out without consequence or to be able remove their responses after submission. With each round, we providing this important information in a document that had to be consented to by selecting 'yes' in the Q1 of each questionnaire round (see Appendix 10.1.1., 10.2.1, and 10.3.1.). All participants consented.

Furthermore, due to the fact that in order to conduct the Delphi approach we needed to obtain personally identifying information, we applied to the Norwegian Centre for Research Data (NSD) for evaluation of our project and presented our plans for data collection, analysis and our research and project plan. Referencing our Case # 573838, our project was evaluated on 08.05.2019, and found to be in compliance. For further details see Appendix 10.6. Ideally, we would have been approved prior to conducting our questionnaire, as well as for the interviews, but due to time constraints this was not possible.

For both our interviews, we presented a document explaining the purpose of the interview and what it would entail. Similarly, to that mentioned above, we explained the rights to data and how we would treat the personally identifying information. We presented a consent form to be signed, also giving the option to participate in the interview without being identified. These documents were signed as informed consent. See Appendix 10.4. And 10.5. for details on the information given and evidence of the consent forms.

4.4.3. Limitations

As discussed, above, the fact that participants were not given an option after Round One to include additional alternatives limits the findings we have. For example, during Round Three, the all-employee questionnaire, participants were not able to contribute additional challenges that may have been overlooked by the expert panel but nevertheless could still pose a big challenge to the company. This means the perspectives of employees subordinate to managers are not considered, as well as not for the managers who did not respond to the questionnaire.

Ideally, to make the perspectives of the panel of experts as representative as possible, we could have engaged in a probabilistic sampling or used a panel or focus group that included a wider group spanning different levels and departments, as well to the other parts of Norway. Since we did not engage in this type of sampling strategy, we can unfortunately also not generalise our research findings as being representative of the Ringnes company as a whole. This means that the findings, as well as the solutions that can be offered, remain specific to the Oslo/Gjelleråsen region and cannot be extrapolated to other operational regions of Norway.

5. Data Analysis

5.1. Questionnaire Round One

5.1.1. Evaluation

In Round One, we contacted Ringnes and requested that our questionnaire be distributed to managers. This questionnaire was made available internally and thus, we cannot comment on the nature of those who responded since we do not know exactly to whom it was made available.

Nevertheless, participants were informed that by completing Round One they must also participate in Round Two. They were also given information about the questionnaire purpose and uses. We received responses from five participants, who will remain anonymous. They were asked to qualitatively describe: "What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please include five or more."

We evaluated each response we received by creating a categorical list. Some responses lent themselves naturally to one category or another, while others were more complicated to evaluate. We were required to interpret some of the responses as well as to determine the best-fit category for what we assessed was trying to be said. The responses that were similar were grouped together and we concluded by finding eight overarching categories as listed in 5.1.2. To learn greater detail about the process of Round One, please see Appendix 10.1. Specially, to discover the exact responses from each participant and which category we coded it as, please refer to Appendix 10.1.4.

5.1.2. Results

Below is a list of the categories chosen for grouping the qualitative responses from 5.1.1.

1. Lack of investment or cutting costs (i.e. into new technology/processes)
2. Lack of alternative transportation (i.e. train or other supplementary transportation)
3. Old or underdeveloped technology (i.e. fuel types, engines, and tires)
4. Lack of sustainable driving (or i.e. other types of training for employees)
5. Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
6. Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
7. Issues with goods (i.e. insufficient stocking of pallets, damaged goods, poor returning logistics of for example, kegs and bottles)
8. Poor organization and/or communication (i.e. setting clear goals and tracking progress on targets, lack of awareness, or poor design for the organizational structure)

5.2. Questionnaire Round Two

5.2.1. Evaluation

The results listed in 5.1.2. were then taken into a new questionnaire for the same five participants. They were then asked: "What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please select exactly four from the categories below."

These responses were more straightforward to evaluate as we simply counted the number of votes for each as displayed in 5.2.2.

To learn greater detail about the process of Round Two, please see Appendix 10.2. Specially, as each of the five participants was allowed to vote four times, please see Appendix 10.2.4. to examine more specifically how each participant allocated their votes.

5.2.2. Results

Below is a graphic description of how the votes from Round Two were distributed.

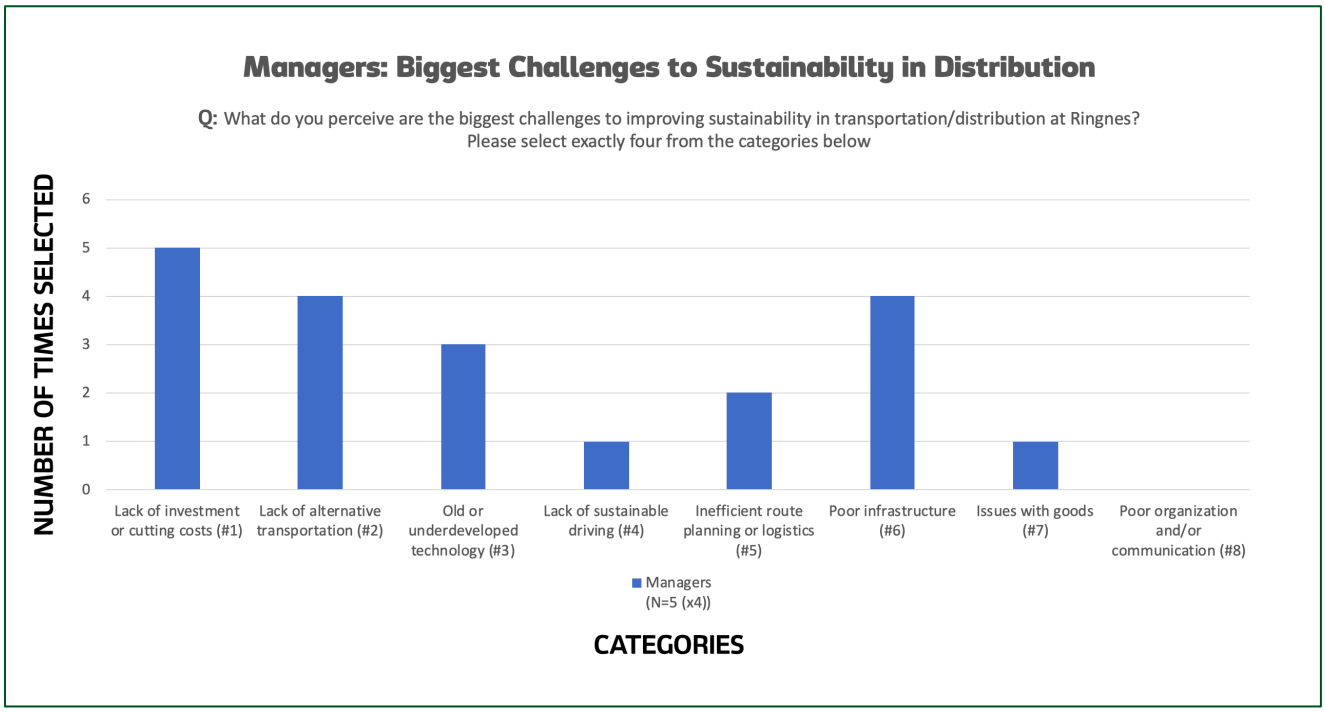

Figure 5.1. Ringnes Managers: Biggest Challenges to Sustainability in Distribution

The categories that received the top five most votes, respectively were:

#1: Lack of investment or cutting costs (five votes)

#2: Lack of alternative transportation (four votes)

#6: Poor infrastructure (four votes)

#3: Old or underdeveloped technology (three votes)

#5: Inefficient route planning or logistics (two votes)

5.3. Questionnaire Round Three

5.3.1. Evaluation

The top five results from Round Two were then taken into a new questionnaire for all employees at Ringnes to participate in. This questionnaire was also made available internally and thus, we cannot comment on the nature of those who responded as this was also kept anonymous. The participants were asked: "What do you perceive as the biggest challenge to improving sustainability in transportation/distribution at Ringnes? Please select only one from the categories below."

We received 22 responses. These responses were also straightforward to evaluate as we simply counted the number of votes for each as displayed in 5.3.2.

To learn greater detail about the process of Round Three, please see Appendix 10.3.

5.3.2. Results

Below is a graphic description of how the votes from Round Three were distributed.

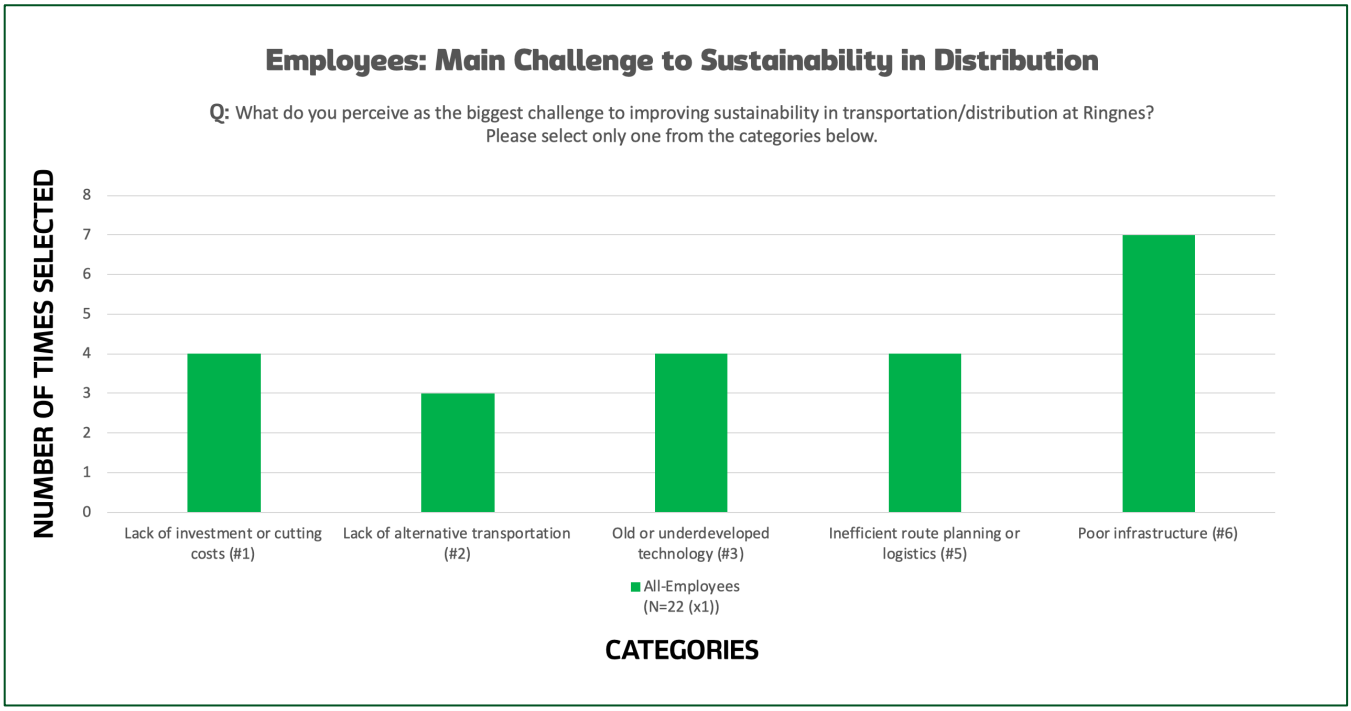

Figure 5.2. All Ringnes Employees: Biggest Challenge to Sustainability in Distribution

The results from this vote, with the votes in descending order, were:

#6: Poor infrastructure (seven votes)

#1: Lack of investment or cutting costs (four votes)

#3: Old or underdeveloped technology (four votes)

#5: Inefficient route planning or logistics (four votes)

#2: Lack of alternative transportation (three votes)

6. Discussion

6.1. RQ1 Discussion

6.1.1. Regulatory Factors

First and foremost, laws and regulations are important factors impacting the sustainability efforts of Ringnes. Laws and regulations need to be followed to avoid fines and to conduct legitimate business. When the EU and Norway placed new regulations on trucks requiring a minimum engine standard equivalent to the emissions from the Euro V engines, Ringnes needed to comply. Naturally, to be an accepted and legitimate firm, complying with the standard requirements is in their best interest, but as per the Porter hypothesis, it also has the ability to impacting the sustainability efforts.

This is the creation of a win-win scenario, where the government introduces regulations and in following them, a firm increases their competitiveness locally. Beyond regulations, governments can also use subsidies and taxes to influence a company's sustainability efforts. For example, the capital city of Oslo has recently put forward incentives for firms to use new trucks that run on renewable energy. Unfortunately, it does not appear that Ringnes is taking advantage of this, as according to Einar Gundersen, Ringnes currently has only one beer-drive truck for short deliveries using biofuels, and no electric trucks.

Norway aims to reduce CO_2 emissions by 15% by 2025 and by 30% by 2030 and will account for new heavy vehicle-types in these emissions (Samferdselsdepartementet, 2019). While just 15% of the traffic on Norwegian roads is comprised of industrial freight (Elvik, 2016), diesel trucks are responsible for almost 30% of the emissions from road traffic (SSB, 2017). Since Norwegian laws regulate who is permitted to operate transport services, and as such, a permit or an operating license is required (Regjeringen, n.d.), as Norway works harder towards meeting these goals, firms may become more and more pressured to do their part.

For example, in the EU, a new requirement was introduced for the purchases of new cars and trucks, where a minimum standard was decided for emissions output by trucks, the minimum requirements of which are met by the Euro V engine. Thus, all new trucks must use or meet the requirements for maximum emissions of the Euro V engine in EU member states (Amundsen & Hagman, 2015). Though Ringnes complies so far with this, having invested in Euro VI engines, as such regulations change and become stricter, this may come to have a large impact on Ringnes' distribution operations. New laws and regulations in Norway may incentivise Ringnes to further sustainability efforts, or eventually force Ringnes to make certain sustainable transitions in their operations beyond what they are now.

6.1.2. Technological Factors

The constant invention of new technology is an important external factor for reaching the zero-carbon emissions goal. With each passing year, the technology of trucks and parts advances, but there are still essential improvements to be made before all such transportation can become emission free.

During Round Two of the questionnaire, 'old and underdeveloped technology' was allocated three votes from our five experts. For Round Three, it obtained four votes from 22 participants. While not the largest problem, these votes indicate that old and underdeveloped technology is still seen as a challenge to sustainability efforts among the managers and employees of Ringnes that we surveyed. It was then important to discover why Ringnes has not invested in the newest technology, such as electric vehicles, for their distribution. According to our background interview with Mr. Gundersen, this is because there are no electric vehicles available with sufficient payload and range (E. Gundersen, personal communication, May 07, 2019; Appendix 10.4.4). This statement was also supported during our expert interview with Mr. Øystese, who stated that the technology available for electric vehicles is not available for the volume needed to transport (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4).

Instead, Ringnes have invested in the best technology they can, the Euro VI engines, which as mentioned earlier, produce less emissions than older engines. These engines also go beyond the minimum legal regulations currently in Norway which illustrate that as a company, they taken sustainability into their strategic plans across their distribution operations. This investment demonstrates action towards their commitment to reducing negative environmental impacts and thus follows their assumed responsibility towards the local communities and environments they operate in. Yet while they have invested in the Euro VI engines, which are beyond the legal regulations, it is perhaps not yet a win-win situation, because it is the electric vehicles that would be the most environmentally friendly, but as of now they are not available in a form meeting the requirements Ringnes has for their distribution operations.

6.1.3. Infrastructural Factors

During Round Two of the questionnaire, 'poor infrastructure' and a 'lack of alternative transportation' were allocated four votes each by experts, making them second/third most voted. In Round Three of the questionnaire to all-employees, poor infrastructure was selected as the greatest challenge to sustainability at Ringnes, with seven votes, while a lack of alternative transportation was voted as the least challenging with only three votes.

This indicates that there is a great concern with traffic and road infrastructure. In relation to the Gjelleråsen factory, Ringnes' largest distribution centre, busy traffic on the highway can lead to high pollution from daily distribution operations at Ringnes. This area is largely industrial, with many nearby factories also dependent on a small highway for the distribution of their goods. As bad traffic is a problem in this area, route planning is an important effort Ringnes' makes to improve their sustainability which will be further discussed in 6.2.3.

In addition to our questionnaire results, Ringnes also mentions the lack of alternative transportation, such as by train, in their sustainability report. In our expert interview, Mr. Øystese explained that they are using trains as much as possible, but the lack of railways covering Norway naturally limits to what extent this can be used (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4). Furthermore, there is limited amount of space on trains which must be reserved, and becomes especially limited during the high season. Thus, a lack of infrastructure for alternative transport, as well as poor infrastructure for their own distribution operations exerts an external and negative impact on their sustainability efforts.

To answer our RQ1) what external factors might impact the sustainability efforts within distribution at Ringnes, we have examined regulatory, technological, and infrastructural factors that exert an external influence over Ringnes' sustainability efforts. While regulatory factors seem to provide a basis for a win-win situation, technological factors do not achieve this as of yet, since there are better alternatives for the environment and community available but not that meets Ringnes' needs. Finally, infrastructural factors act negatively in this regard, as such development projects rely on government interests and plans, of which Ringnes may have limited ability to affect. This means there is a wide range of good and bad external factors that are impacting and can further impact the efforts made for a sustainable transition within Ringnes' distribution operations.

6.2. RQ2 Discussion

6.2.1. Organisational Factors

As mentioned in Chapter 2, Ringnes is owned by the Carlsberg Group. The relationship between the parent and child company can be shown quite clear when analysing their sustainability reports, as they are structured in the same way, have the same goals with the "four time zero" strategy, and also use the SDGs and even the 2015 Paris Agreement, which aims to keep the global temperature below 1.5 degrees Celsius, as their list of priorities and goals to

work towards. As discussed in Chapter 3, such goals are structured as general international guidelines and thus do not provide any specific regulations, targets, strategies or criteria to base decisions on.

To positively contribute to these large international goals, as well as reach their own "four time zero" goals, is very ambitious. This can be seen in the reports of both companies, where there is a lack of information about how they plan to address these goals in practise and a lack of any raw data demonstrating progress towards these within their distribution operations. Yet in our expert interview, we were informed that in Ringnes' 2018 sustainability report, they will be presenting their goals more clearly with defined targets and an achievement strategy.

As is often important to understand when a parent company is involved, the role that Carlsberg plays in the decision-making and distribution operations at Ringnes is not always clear. During our background interview, Mr. Gundersen wrote that most goals and KPIs are coming from Carlsberg centrally. When they invest in or lease new trucks, they do so locally with the support from central team. As long as decisions support the greater goals, local initiatives are appreciated (E. Gundersen, personal communication, May 07, 2019; Appendix 10.4.4).

Hence it seems as though the overall goals are the same for both Carlsberg and Ringnes, making Carlsberg a key contributor to efforts, but where Ringnes maintains some autonomy to make their own decisions and develop their own strategies. Mr. Øyestese confirmed this when he said that Ringnes is part of the Carlsberg family, and must therefore follow their aims and targets. He continued by explaining that Ringnes can set some of their own targets as long as they at minimum achieve the Carlsberg targets, but have the ability to go further beyond this to achieve even more (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4).

That Ringnes is bound by the Carlsberg Group's organisational structure and goals is seen as an internal factor that can have an impact on their own sustainability efforts. For example, it may prove more difficult for Ringnes to show their own progress and achievements from a local perspective. As discussed in Chapter 3, the options to report on the progress of CSR and sustainability efforts is an important tool to communicate actions, show transparency, build legitimacy and establish trust as a company. If targets are not made local and understandable to a wide variety of stakeholders, if goals do not seem reachable, or if information is not specific or is appears to be misleading, the accusation of greenwashing becomes a huge risk to a firm's reputation (Aggarwal and Kadyan, 2011).

In effort to determine if this was occurring in Ringnes' own sustainability report, we examined it in-depth. We saw that measures made by both Ringnes and Carlsberg have a clear

focus on reduction of carbon emissions in their goals. However, what is actually presented in the short section that concerns distribution and transport is actually the reduction made in the local air pollution by introducing the new Euro VI engines. The numbers presented on a reduction of 5.6 % of diesel fuel are from 2015 until today, and yet specific efforts for making progress are not made clear. It is a case of greenwashing if a company places more emphasis on showing environmentally-friendly achievements and withholds the negative impacts or areas they do not perform to well in.

Here, Ringnes exercises good reporting by being transparent about the areas they are not performing well in. As stated, within distribution, their report shows that they have not achieved any reductions between 2016 and 2017, and they even disclose that their oil consumption as a whole company has increased by 57% since 2016 (Ringnes, 2018). They explain that some of the reasons this has happened are unrelated to distribution, being due to seasonal difficulties, issues with weather, and some unforeseen challenges when implementing new technologies.

What is also important is that during Round Two of the questionnaire, "poor organization and/or communication (i.e. setting clear goals and tracking progress on targets, lack of awareness, or poor design for the organizational structure)" was the only option of eight to receive zero votes from the expert panel. This indicates that according to those we surveyed, at least at the management level, the organisational structure of belonging to the Carlsberg Group, is not seen as a challenge to Ringnes' sustainability efforts in relation to their distribution operations.

6.2.2. Financial Factors

The financial aspects of a firm are arguably one of the most important driving factors of business operations and strategy. Being able to generate a profit (or take risk for later profit) as well as reinvest profits in certain aspects of the firm to generate future profits and value are essential.

In the results from our questionnaire, we identified that how Ringnes invests and uses its finances may play a critical internal role in how it is able to approach sustainability. In Round Three of the questionnaire, addressing all-employees, a "Lack of investment or cutting costs (i.e. into new technology/processes)" received four votes, tying it with two others for the second most challenging. For Round Two of our questionnaire, using expert consultation, each expert identified the "Lack of investment or cutting costs (i.e. into new technology/processes)" as

being one of the biggest challenges. It was also the only challenge that all experts surveyed agreed upon.

This means that per our expert consultation, how Ringnes invests in sustainability and where the efforts are made from the financial aspects may be of concern. Unfortunately, Ringnes does not produce its own financial report, and the Carlsberg Group report does not indicate for Ringnes how much and where its investments are made. This information was not made publicly available and was not able to be expanded on in a meaningful way in our interviews. Thus, we were not able to investigate further to determine what kinds of sustainable investments Ringnes is making and to what extent they are allocating their budget for purchases to improve their sustainability efforts.

All we can comment on is that the experts we surveyed in our questionnaire may not perceive Porter's theory of a win-win situation occurring at Ringnes. In other words, further investment or better budget allocation may be necessary to meet the financial needs of certain stakeholders while still addressing Ringnes' negative environmental impacts and enacting their environmental responsibilities as a firm to the communities they operate in.

6.2.2. Logistical Factors

Internal logistics is another factor that can impact the sustainability efforts at Ringnes. From the questionnaire, the employees in Round Three found logistics as a big issue, with four votes, whereas the managers with only gave it two votes. To thus examine this, we first needed to discover the role of route planning, which our questionnaire indicated might be an important internal factor that has the ability to contribute both negatively and positively towards efforts, depending on how it is being implemented and followed up on.

Unfortunately, Ringnes does not provide any information on to what degree the route planning has worked itself, making it difficult to conduct further research on. It is possible that their reduction in diesel consumption discussed previously could be an effect of efficient route planning. However, given that there is no change in diesel consumption from 2016 to 2017 we cannot be sure. According to Mr. Øystese, Ringnes has something that they call the "perfect plan" in route planning, which they are continuously optimising. Yet they acknowledge that there will always be queues and other delays that result in route deviations, sitting in traffic, and even complaints from customers for not following their timeline (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4). From this perspective, it can also be seen as an external infrastructural problem.

In terms of internal solutions however, at Gjelleråsen they keep distribution operations open 24 hours a day, making it possible to avoid the worst traffic during the busiest hours. Additionally, in their sustainability report, Ringnes mentions that they focus on training in environmentally-friendly driving. This includes route planners that are updated on a daily basis, training for their drivers on how to drive in a sustainable manner and the use of an online-system (telematics) that measures driver behaviours (Ringnes, 2018).

To answer our RQ2) what internal factors might impact the sustainability efforts within distribution at Ringnes, we have considered three sets of factors: organisational, financial, and logistical. Organisational factors relate to Ringnes' relationship with the Carlsberg Group and their level of autonomy to set and alter their goals and efforts. This also acts as a base for the financial factors, in terms of what Ringnes is able to invest in. We found that while external factors can have a significant impact, internal factors play the more foundational role in determining how external factors can be adapted to or taken advantage of. This means that many of the aforementioned factors will inevitably distill down to the finances available and organisational ability to address them. For example, in addition to technological factors being external in terms of what is developed and available, it also relates to internal factors in terms of what technologies are invested in.

6.3. RQ3 Discussion

6.3.1. Challenges

The biggest challenges identified in our research relate to the five areas selected by our panel of experts, and as confirmed through our all-employee questionnaire. This means that while not without variation, the distribution of the votes indicates that there are no challenges that seem to be misidentified (such as receiving no votes).

As demonstrated on the next page in Figure 6.2., given that the spread seems to differ between the experts' votes and the votes of all the employees, it does not appear that any one option must be examined, but rather that each of the five categories pose a potential challenge and thus must each be engaged with for finding potential solutions. In addressing these challenges, the aim is that Ringnes may be able to take small steps to improve their sustainability efforts within their distribution operations.

It is also important to note that such challenges are not mutually exclusive. Challenges can build on each other, whereby one factor makes others more difficult, or conversely if one challenge is solved it may alleviate the difficulties in another.

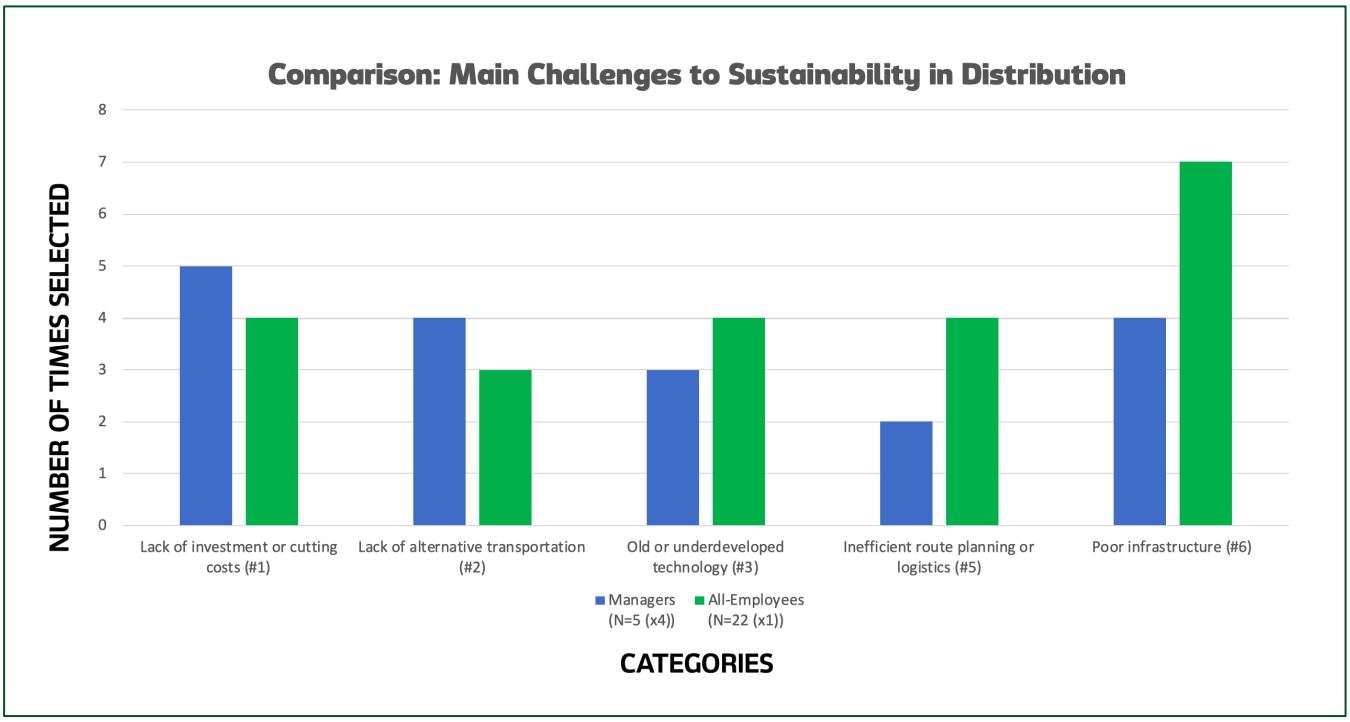

Figure 6.1. Comparison of Rounds: Main Challenges to Sustainability in Distribution

6.3.2. Solutions

In order to address our final research question, we examine each of the challenges discovered throughout our research process as well as from our expert interview, and inquire about possible solutions to surmount them. As alluded to on the previous page, since the challenges can overlap, this also means that the solutions available may overlap, in that some solutions for one challenge may in fact depend upon other factors or solutions related to entirely different challenges.

Lack of investment or cutting costs

One of the biggest challenges to sustainability that both managers and employees at Ringnes emphasised in our data collection and analysis was the lack of investment, for example into new technologies. Mr. Øystese stated that Ringnes optimises their distribution operations based on the conditions that exist in society, meaning that they have to use the technologies that exist today. Unfortunately, at the moment, they cannot invest in a way to further their sustainability efforts because what they need is not available, and may not be for an estimated five to ten years. For example, if there were better solutions and alternatives to diesel cars they are interested in investing (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4).

Electric cars and trucks would be a good solution with time, when newer and better technologies exist. Unfortunately, is does not appear that Ringnes has the ability or interest to begin their own reach and development into development such technology. In Norway, there are only a few companies that currently distribute their products with electric vehicles. Ringnes has short-term licensing agreements so they can be flexible if the technology does get developed to their standard (ibid). Self-driving cars are another solution that Mr. Øystese informed us about in the interview, which they would be interested in investing in, if they can find vehicles that meet their requirements (ibid).

Importantly, Ringnes does not seem to be looking into altering their distribution operations in such a way that they can then invest in these technologies that are available. Perhaps this is a factor that can be looked at in the future, as then they can invest in what is available. Plainly put, rather than not investing due to it not being at the standard necessary for current operations, they can alter their operations.

Lack of alternative transportation

When it comes to possible solutions for alternative transportation, the optimal solution would be an improvement in train facilities. This is something Mr. Øystese stated in the interview that Ringnes would absolutely help their sustainability efforts (ibid). However, as mentioned in Chapter 2, the rail network across Norway is sparse and not all the infrastructure is of the highest quality. Ringnes' regrets that the freight transport "Raumabanen" is closed, and expressed that it would be beneficial to their efforts if it were re-established and operational. If this were to become an option, the distribution operations to Molde and Ålesund could be done by train instead.

Another issue, as mentioned, is that the capacity on the current freight transportation trains. Increasing this capacity could also improve Ringnes' efforts. The trains currently have a maximum length of goods for 150 meters. This, together with a general lack of availability and the need for reservations, which during high-season reduces their access, limits the extent that this alternative transportation for the distribution of goods can be used (ibid).

While this is a challenging area to provide a solution for, some combination of using smaller electric trucks for deliveries to and from the train stations could be something worth looking into. Yet for even this to be a viable option, better conditions and capacity will still be needed for trains, especially in areas with high distribution needs such as Bergen, Trondheim, and Stavanger.

Poor infrastructure

The challenge regarding poor infrastructure was the one alternative that the participants involved in our data collection demonstrated as being considered one of the biggest challenges in terms of improving sustainability. According to Mr. Øystese, this issue is largely an external factor that the leadership at Ringnes does not feel is something they can address directly (ibid). However, they hope to further their partnership with local projects to improve these external infrastructure challenges, such as through the Stor Oslo Nord project, which Ringnes became a partner to in May 2018.

As an example of the type of project that can help not only the sustainability efforts of Ringnes, but other industries in the area is the Stor Oslo Nord project. The main objective of this project is to achieve a greater focus on the improvement and the development of the transportation sector in Eastern Norway (Straume, 2016), and underlines the importance of environmental considerations and socio-economic profitability as a basis for transportation policy (Regjeringen, 2016). It is a collaboration between the municipalities in Akershus and Oppland (ibid), where they try to, according to Mr. Øystese, to implement this infrastructure improvement project into Norway's National Transport Plan (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4). However, the project has still to be approved as part of the plan, which will be updated in mid-2020.

The Stor Oslo project focuses improving Highway 4 and Gjøvikbanen and making it more modern and efficient, and aims to reduce travel time along the highway and introduce an increase in train departures. To achieve this, they plan to develop a new track and create a double track on the distance between Oslo to Roa. In the long-term, Gjøvikbanen will be extended and linked to Dovrebanen (Straume, 2016). They have also planned to construct of four-lane road from Raufoss / Gjøvik to Mjøsbrua, and a new and improved highway 4 between Nittedal and Oslo (Gjøvikregionen, n.d).

The important thing about partnering with projects like this, is that it involves Ringnes in the local communities and helps to develop them through a win-win situation as Porter suggests. For Ringnes, it provides increased competitiveness, as well as for the other industries in the region due to reduced driving time and more efficient logistics (ibid). Along with improving their distribution, it can allow them to reduce their negative environmental impacts and further their sustainability efforts, as well as work together with local neighborhoods and stakeholders consisting of both people and firms. Public health in these areas, for example, could be improved due to less pollution and improved roads could lead to a decrease of emissions, reduce the frequency of accidents, and produce less harmful microplastics.

Old or underdeveloped technology

Beyond what has already been mentioned, it is challenging to add to further solutions regarding technology in any meaningful way. This challenge fits closely with the lack of investment and cutting costs challenge. Electric vehicles are not yet an option for a win-win solution for Ringnes as the Porter hypothesis refers to, but as technology continues to improve its range and load capacities, there will likely be a shift to better transportation options. Mr. Øystese mentioned that he hopes that an implementation- like another part of the Carlsberg Group did in Switzerland- by changing their truck fleet to electronic will soon be a possibility, but it is not clear when this could come to fruition (S. Øystese, personal communication, May 09, 2019; Appendix 10.5.4).

Inefficient route planning or logistics

The results of our questionnaire demonstrated that both managers and employees at Ringnes felt that another big challenge to sustainability efforts within distribution operations was inefficient route planning or other issues with logistics. One solution that Mr. Øystese highlighted was that Ringnes is shifting their working hours and this may have an impact on their logistic possibilities and other operations. If a significant number of their trucks are on their way out of the Gjelleråsen factory to distribute goods by 06:00, the majority of traffic queues on the roads will not have begun. Thus, drivers might have more flexibility to complete their route as planned.

Ringnes also uses a software for route planning that they plan to upgrade in an effort to become more user-friendly and provide better simulations and optimization (ibid). In addition, the Stor Oslo North project is another solution to this issue, and something Mr. Øystese think would improve the conditions for roads and traffic. But as mentioned, he thinks that it would happen a long time in the future (ibid).

In order to answer our RQ3) what are some possible solutions to improve the sustainability efforts within distribution at Ringnes, we have examined each of the five areas highlighted by experts and confirmed by employees in our questionnaire process. We have supplemented our own research with the background and expert interviews we conducted. Overall, this has allowed us to offer suggestions for how to, for example, make efforts to improve the infrastructure situation locally, such as by being a partner of the Stor Oslo Nord project that aims to develop new and better infrastructure that could positively impact the sustainability efforts at the Gjelleråsen factory.

7. Significance and Recommendations

Though not addressed in our research questions, an important part pursuing practical research involving a firm is that the findings have real-world meaning and relevance. Thus, we offer some practical recommendations as related to Ringnes' sustainability report and reporting process, with the aim of helping to improve future reporting practices and results at Ringnes.

First, is that the overall goals presented in Ringnes' sustainability report follow international targets, instead of more specific achievable targets. We therefore suggest that more concrete goals be selected, with local strategic targets used to measure progress and to eventually reach those goals. Of course, these can fit towards larger international goals, but making them specific to Ringnes and the relevant operations is also important. For example, the presentation of the collective "Four times zero" goals appear misleading when examined further. The zero-carbon footprint goal is presented in the report, but when referencing the specific section, it states that only the breweries will achieve this goal of zero emission- it will not be achieved throughout the entire supply chain. We also recommend reporting on specific actions and solutions that Ringnes is planning for the coming years.

In general, the sustainability report from Carlsberg is much more complex than Ringnes' such as by including raw data on their progression and showing explicit results. While Carlsberg is a bigger company, Ringnes should still be able to follow some of these important practices. Due to the focus of this paper, we have recognised a specific potential for improvement on the reporting for distribution operations. Reducing the emissions from distribution of goods has great potential and the development is happening rapidly. Although, Ringnes is taking measures to reduce the fuel consumption, has invested in new trucks and are following technological developments, we recommend that Ringnes places a greater focus on these activities in their report. This could include better data and information on their progress.

Overall, the Ringnes sustainability report is well structured and has a pleasant and intriguing design. We found the content interesting and easy to understand, though, as discussed, there is additional information that should be added. Continued efforts towards making specific, achievable goals, and including the raw data and strategies will build the trust of the wider group of Ringnes' stakeholders. Sustainability reporting is becoming increasingly important, with more and more attention and critical eyes reading the reports. If Ringnes takes this seriously, they have the opportunity to become a leader in this area and to take an active role in furthering their sustainability efforts and working towards a sustainable transition within their distribution operations.

8. Conclusion

This paper has addressed previous and current sustainability efforts within distribution operations at the Ringnes firm. Building upon Porter's hypothesis of win-win scenarios, CSR, sustainability reporting, and the notion of environmental management, we have examined many external and internal factors that impact the sustainability efforts at Ringnes. A significant amount of our data has been collected ourselves, including a three-round questionnaire and two interviews with employees at Ringnes. In doing this, we uncovered many challenges to sustainability as well as possible solutions. With this data and building upon our theories and concepts, we gain further insight into our RQs.

Our first research question was: What external factors might impact the sustainability efforts within distribution at Ringnes? The external factors we found included regulatory, technological and infrastructural factors. Since set regulations from government needs to be followed, these can naturally influence their sustainability efforts in a positive way. Old and underdeveloped technology was pointed out as a significant issue; however, emission-free technology is not yet good enough to meet Ringnes' needs. Poor infrastructure was highlighted as one of the most challenging issues, but alongside this comes the options for alternative transportation. Unfortunately, improving infrastructure and using alternative transportation is not always an option, but it seems as though Ringnes is working to take an active role where they can, such as through strategic partnerships.

For our second research questions: What internal factors might impact the sustainability efforts within distribution at Ringnes? The internal factors uncovered in our questionnaire related to organisational, financial and logistical factors. Since Ringnes is a part of the Carlsberg Group, this relationship naturally affects what sustainability goals are implemented at Ringnes, as well as what they can invest in, and how they are able to take advantage and adapt to changing external factors. Additionally, logistics such as how the company plans their driving and distribution can also play a role in their sustainability efforts.

For our third research question: What are some possible solutions to improve the sustainability efforts within distribution at Ringnes? Here we discussed many possible solutions relating to the five main challenges identified in the questionnaire: lack of investment, lack of alternative transportation, old technology, poor infrastructure, and inefficient route planning. We conclude that for the sustainability efforts at Ringnes, the external factors have a significant impact, but the internal factors play the more fundamental role in determining how external factors can be adapted to or taken advantage of.

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10. Appendix

Table of Contents

10.1. Questionnaire Round One (R1)

10.1.1. R1 Questionnaire Information

Thank you for your interest in participating in our survey! Are you interested in taking part to the research project:

"Environmental CSR in Norway's Beverage Industry:
A Case Study of Ringnes' Transportation Sector"

Dear Sir/Madam,

We are a group of master's students (Hannah Marie Hernandez, Anna Löfvenius, Kristin Sørbøen Gåsbakk, and Hilde Grønlien) in International Environmental Studies at the Norwegian University of Life Sciences (NMBU). This project is for one of our courses, Environmental Management and Sustainability Reporting (BUS311). Under the supervision of Prof. Ståle Navrud, we are conducting research into the sustainability of the beverage industry in Norway with a special focus on the transportation and distribution sector at Ringnes. Largely using the Corporate Social Responsibility framework, our project is investigating the challenges Ringnes faces in making this sector more sustainable.

Below we will provide information about what your participation will involve. The data collected will be used to create a larger survey for all employees at Ringnes.

Who is responsible for the research project?
The Norwegian University of Life Science (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are requested to complete this survey because you are considered to be a manager or holding a position of leadership. It does not matter which department you belong to.

What does participation involve for you?
If you chose to take part in the project, you will answer 'I agree' and complete the survey below.
There are two rounds necessary to complete this survey. It is important you are able to commit to participation in both rounds. In the first round, we will ask what managers perceive as challenges to sustainability in the transportation sector at Ringnes in a two-minute survey. From these results, we will compile a list of the main responses, and then have a second round where we will ask managers to rank them in another two-minute survey. After this, we hope to get a list of the top five, which we will then include in a separate, all-employee survey.

Participation is voluntary:
Participation in the project is voluntary. If you do choose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy and storage of personal data:
In the first round of the survey, will need to gather employee information: full name, company email, and position in the company. We collect this information because the second round of the survey needs to include the same participants as the first, and contacting participants directly is the easiest way to ensure this. Your data will be available only to the members of our group (listed above). One group member will replace each name and contact details with a code. The list of names, contact details and respective codes will be stored separately from the rest of the collected data. We will treat this personal information securely and in accordance with the rules of the Norwegian Centre for Research Data. Any personal or identifying information will not be included in our paper and be kept completely confidential.

Where can I find out more?
The full results of the research will be available approximately in May 2019. If you have question contact:
via Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor

If you agree to participate in our two-round survey, which includes being contacted directly for the second round, please select 'I agree' in the survey: https://forms.gle/g7FKWSQbotofLs6x9

10.1.2. R1 Questionnaire Guide

Sustainability Survey: Ringnes

Welcome to our student project on the sustainability of the transportation sector at Ringnes. This is the first survey of two. Please complete it by Tuesday, 09 April 2019.

It will take approximately two minutes. It is important you are able to commit to participation in both rounds.

Here, in this first round, we ask that managers write what they perceive as challenges to sustainability in the transportation sector at Ringnes. From these results, we will compile a list of the main responses, and then have a second round where we will ask the same managers to rank them in another two-minute survey. After this, we hope to get a list of the top five, which we will then include in a separate, all-employee survey.

If you have an question or concerns please contact:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor
Thank you for your time!

Velkommen til prosjektet vårt om bærekraft i transportsektoren hos Ringnes. Dette er det første spørreskjemaet, av totalt to. Vær vennlig å gjennomføre undersøkelsen innen 09.april 2019.

Denne vil ta omtrent to minutter å fullføre. Det er viktig at du kan forplikte deg til å delta i begge delene.

I denne delen spør vi ledere i Ringnes om de kan svare på hva de ser på som bærekraftsutfordringer innen transportsektoren. Vi kommer til å lage en liste over hovedutfordringene, hvor vi i andre runde vil spørre de samme lederne om å rangere disse. Etter dette håper vi at vi har en liste over fem hovedutfordringer, som vil bli inkludert i en separat undersøkelse som sendes til alle ansatte.

Har du noen spørsmål angående undersøkelsen, ta gjerne kontakt:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – veileder
Tusen takk for at du tok deg tid til å besvare undersøkelsen!

10.1.3. R1 Questionnaire

Sustainability Survey: Ringnes

Q1. I have read the information provided in the Ringnes Survey Guide (https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing) and agree to participate in this survey.

Jeg har lest og forstått informasjonen i "Ringnes Survey Guide" (https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing), og ønsker å delta i denne undersøkelsen. Dersom du ønsker å få tilsendt informasjonen i "Ringnes Survey Guide" på norsk, ta gjerne kontakt med oss.

- ☐ Yes/Ja
- ☐ No/Nei

Q2. Full name

Fullt navn

- ☐ _____ [Blank: write-in]

Q3. Email

Epost

- ☐ _____ [Blank: write-in]

Q4. Your job position in Ringnes

Din stilling i Ringnes

- ☐ _____ [Blank: write-in]

Q5. What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please include five or more.

Hva ser du på som de største utfordringene for å gjøre transport og distribusjon mer bærekraftig i Ringnes? Nevn fem eller flere.

- ☐ _____ [Blank: write-in]

10.1.4. R1 Questionnaire Responses & Coding

Participant A	
RESPONSE	CODING
a) Not willing to invest heavily in new trucks due to unclear future distribution setup b) Lack of capacity with train c) Traffic around Oslo and other cities d) Use of third parties' drivers with old trucks e) Drive environmentally friendly	**a) Lack of investment** **b) Alternative transportation** **c) Traffic** **d) Technology** **e) Sustainable driving**

Participant B*	
RESPONSE	CODING
a) Lav fyllingsgrad på paller og biler *The cars and pallets are not fully stocked* b) Høye utslipp fra gamle biler *High emissions from old cars* c) at man ikke kjører korteste rute ved levering *Do not drive the shortest route when delivering goods* d) Manglende retur-logistikk *Lack of logistics of return* e) Bulking av varer samt varer som flyttes fram og tilbake mellom lagersteder *The goods are damaged during transportation*	**a) In-house logistics** **b) Technology** **c) Road logistics** **d) Road logistics** **e) Poor handling of goods**

Participant C	
RESPONSE	CODING
a) Distance b) Fuel types c) Conditions on the roads d) Supplementary options of transportation e) Marked conditions for transportation (Cutting cost)	**a) Road logistic** **b) Technology** **c) Infrastructure** **d) Alternative transportation** **e) Market/cutting costs**

Participant D*	
RESPONSE**	CODING
a) Transport er forbundet med utslipp *Transportation is associated to emissions* b) Transport over landegrenser er forbundet med sosial dumping, biler som er dårlig utstyrt med f.eks dårlige dekk. gamle motorer etc. mange aktører er tydelige på at de satser på el, biler etc. *Cross-border transport is associated with social dumping, cars that are poorly equipped with e.g., poor tires, old engines etc. many actors are clear that they are focusing on electricity, cars etc.* c) Vi må kunne fortelle samfunnet mer om alt det bra vi gjør og være stolte av det. legge noen uttalte ambisjoner knyttet til utslipp fra transport og følge opp dette utad, prate om det. *We need to tell the society more about what is good about our work and that we can be proud of it, make ambitions related to emissions from transportation and follow it up, talk about it.*	**a) Technology** **b) Technology** **c) Communication**

Participant E*	
RESPONSE	CODING
a) Investeringer i miljøvennlig biler *Investments in environmentally friendly cars* b) Tilgang til togtransport *Access to train as transportation* c) Dårlig infrastruktur (sprengt veinett i området rundt Gjelleråsen medfører unødige utslipp) *Bad infrastructure* d) Redusere behovet for plast ved transport (rundt paller) *Reduce the need for plastic in transport* e) Lite fleksible leveringstider hos kunder *Not flexible delivery times among customers*	**a) Technology** **b) Alternative transportation** **c) Infrastructure** **d) Reduce plastic waste** **e) Delivering logistics**

N=5

*Response was originally in Norwegian

**Note: Not all participants contributed 5 clear categories (demonstrated above through the coding)

10.1.5. R1 Results

Categories

1. Lack of investment or cutting costs (i.e. into new technology/processes)
Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

2. Lack of alternative transportation (i.e. train or other supplementary transportation)
Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

3. Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

4. Lack of sustainable driving (or i.e. other types of training for employees)
Mangel på bærekraftig kjøring (eller f.eks andre former av kjøreopplæring)

5. Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

6. Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

7. Issues with goods (i.e. insufficient stocking of pallets, damaged goods, poor returning logistics of for example, kegs and bottles)
Problemer med varene (f.eks lav fyllingsgrad av paller, ødelagte varer, dårlig tilbakelevering logistikk f.eks på flasker og ølfat)

8. Poor organization and/or communication (i.e. setting clear goals and tracking progress on targets, lack of awareness, or poor design for the organizational structure)
Dårlig organisering og/eller kommunikasjon (f.eks sette klare mål og oppfølge dem, mangel på bevissthet, eller organisasjonsstrukturen er dårlig designet)

10.2. Questionnaire Round Two (R2)

10.2.1. R2 Questionnaire Information (same as R1)

Thank you for your interest in participating in our survey! Are you interested in taking part to the research project:

"Environmental CSR in Norway's Beverage Industry:
A Case Study of Ringnes' Transportation Sector"

Dear Sir/Madam,

We are a group of master's students (Hannah Marie Hernandez, Anna Löfvenius, Kristin Sørbøen Gåsbakk, and Hilde Grønlien) in International Environmental Studies at the Norwegian University of Life Sciences (NMBU). This project is for one of our courses, Environmental Management and Sustainability Reporting (BUS311). Under the supervision of Prof. Ståle Navrud, we are conducting research into the sustainability of the beverage industry in Norway with a special focus on the transportation and distribution sector at Ringnes. Largely using the Corporate Social Responsibility framework, our project is investigating the challenges Ringnes faces in making this sector more sustainable.

Below we will provide information about what your participation will involve. The data collected will be used to create a larger survey for all employees at Ringnes.

Who is responsible for the research project?
The Norwegian University of Life Science (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are requested to complete this survey because you are considered to be a manager or holding a position of leadership. It does not matter which department you belong to.

What does participation involve for you?
If you chose to take part in the project, you will answer 'I agree' and complete the survey below.
There are two rounds necessary to complete this survey. It is important you are able to commit to participation in both rounds. In the first round, we will ask what managers perceive as challenges to sustainability in the transportation sector at Ringnes in a two-minute survey. From these results, we will compile a list of the main responses, and then have a second round where we will ask managers to rank them in another two-minute survey. After this, we hope to get a list of the top five, which we will then include in a separate, all-employee survey.

Participation is voluntary:
Participation in the project is voluntary. If you do choose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy and storage of personal data:
In the first round of the survey, will need to gather employee information: full name, company email, and position in the company. We collect this information because the second round of the survey needs to include the same participants as the first, and contacting participants directly is the easiest way to ensure this. Your data will be available only to the members of our group (listed above). One group member will replace each name and contact details with a code. The list of names, contact details and respective codes will be stored separately from the rest of the collected data. We will treat this personal information securely and in accordance with the rules of the Norwegian Centre for Research Data. Any personal or identifying information will not be included in our paper and be kept completely confidential.

Where can I find out more?
The full results of the research will be available approximately in May 2019. If you have question contact:
via Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor

If you agree to participate in our two-round survey, which includes being contacted directly for the second round, please select 'I agree' in the survey: https://forms.gle/g7FKWSQbotofLs6x9

10.2.2. R2 Questionnaire Guide

Sustainability Survey: Ringnes

Welcome to our student project on the sustainability of the transportation sector at Ringnes. Please complete it by Monday, 29th of April 2019.

This is the second round of the survey and will only take a few minutes to complete. Here we are asking managers in Ringes to choose what they perceive as the main challenges to sustainability in the transportation sector. After this, we hope to complete a list of five main challenges, which will be included in a separate survey for all the employees in Ringes.

If you have any questions or concerns please contact:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor
Thank you for your time!

Velkommen til prosjektet vårt om bærekraft i transportsektoren hos Ringnes. Vær vennlig å gjennomføre undersøkelsen innen mandag 29. april 2019.

Dette er andre runde av spørreundersøkelsen og vil bare ta noen få minutter å besvare. I denne delen spør vi ledere i Ringnes om de kan velge på hva de ser på som bærekraftsutfordringer innen transportsektoren. Etter dette håper vi at vi har en liste over fem hovedutfordringer, som vil bli inkludert i en separat undersøkelse som sendes til alle ansatte.

Har du noen spørsmål angående undersøkelsen, ta gjerne kontakt:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – veileder
Tusen takk for at du tok deg tid til å besvare undersøkelsen!

10.2.3. R2 Questionnaire

Sustainability Survey: Ringnes

Q1. I have read the information provided in the Ringnes Survey Guide (https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing) and agree to participate in this survey.
Jeg har lest og forstått informasjonen i "Ringnes Survey Guide" (https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing), og ønsker å delta i denne undersøkelsen. Dersom du ønsker å få tilsendt informasjonen i "Ringnes Survey Guide" på norsk, ta gjerne kontakt med oss.

- ☐ Yes/Ja
- ☐ No/Nei

Q2. Full name
Fullt navn

- ☐ _____ [Blank: write-in]

Q3. What do you perceive are the biggest challenges to improving sustainability in transportation/distribution at Ringnes? Please select exactly four from the categories below
Hva ser du på som de største utfordringene for å gjøre transport og distribusjon mer bærekraftig i Ringnes? Velg nøyaktig fire kategorier nedenfor.

- ☐ Lack of investment or cutting costs (i.e. into new technology/processes)
Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

- ☐ Lack of alternative transportation (i.e. train or other supplementary transportation)
Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

- ☐ Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

- ☐ Lack of sustainable driving (or i.e. other types of training for employees)
Mangel på bærekraftig kjøring (eller f.eks andre former av kjøreopplæring)

- ☐ Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

- ☐ Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

- ☐ Issues with goods (i.e. insufficient stocking of pallets, damaged goods, poor returning logistics of for example, kegs and bottles)
Problemer med varene (f.eks lav fyllingsgrad av paller, ødelagte varer, dårli tilbakeleveringslogistikk f.eks på flasker og ølfat)

- ☐ Poor organization and/or communication (i.e. setting clear goals and tracking progress on targets, lack of awareness, or poor design for the organizational structure)
Dårlig organisering og/eller kommunikasjon (f.eks sette klare mål og oppfølge dem, mangel på bevissthet, eller organisasjonsstrukturen er dårlig designet)

10.2.4. R2 Questionnaire Responses & Coding

Responses

		Category							
		#1	#2	#3	#4	#5	#6	#7	#8
Participant	A	X		X		X		X	
	B	X	X	X			X		
	C	X	X			X	X		
	D	X	X		X		X		
	E	X	X	X			X		

N=5 (4 votes per N)

Coding

#1) Lack of investment or cutting costs (i.e. into new technology/processes)
Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

#2) Lack of alternative transportation (i.e. train or other supplementary transportation)
Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

#3) Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

#4) Lack of sustainable driving (or i.e. other types of training for employees)
Mangel på bærekraftig kjøring (eller f.eks andre former av kjøreopplæring)

#5) Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

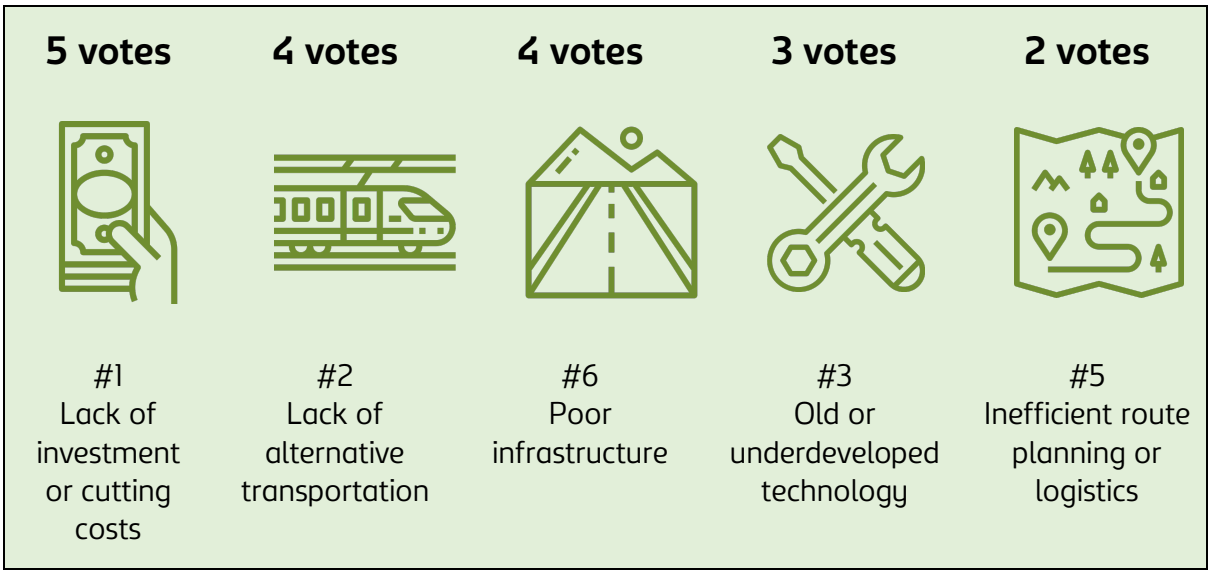
#6) Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

#7) Issues with goods (i.e. insufficient stocking of pallets, damaged goods, poor returning logistics of for example, kegs and bottles)
Problemer med varene (f.eks lav fyllingsgrad av paller, ødelagte varer, dårlig tilbakelevering logistikk f.eks på flasker og ølfat)

#8) Poor organization and/or communication (i.e. setting clear goals and tracking progress on targets, lack of awareness, or poor design for the organizational structure)
Dårlig organisering og/eller kommunikasjon (f.eks sette klare mål og oppfølge dem, mangel på bevissthet, eller organisasjonsstrukturen er dårlig designet)

10.2.5. R2 Results

Votes



N=5 (4 votes per N)

Icons made by [monkik] from www.flaticon.com

Categories

#1) Lack of investment or cutting costs (i.e. into new technology/processes)
Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

#2) Lack of alternative transportation (i.e. train or other supplementary transportation)
Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

#3) Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

#5) Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

#6) Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

10.3. Questionnaire Round Three (R3)

10.3.1. R3 Questionnaire Information

Thank you for your interest in participating in our survey!
Are you interested in taking part to the research project:

**"Environmental CSR in Norway's Beverage Industry:
A Case Study of Ringnes' Transportation Sector"**

Dear Sir/Madam,

We are a group of master's students (Hannah Marie Hernandez, Anna Löfvenius, Kristin Sørbøen Gåsbakk, and Hilde Grønlien) in International Environmental Studies at the Norwegian University of Life Sciences (NMBU). This project is for one of our courses, Environmental Management and Sustainability Reporting (BUS311). Under the supervision of Prof. Ståle Navrud, we are conducting research into the sustainability of the beverage industry in Norway with a special focus on the transportation and distribution sector at Ringnes. Largely using the Corporate Social Responsibility framework, our project is investigating the challenges Ringnes faces in making this sector more sustainable.

Below we will provide information about what your participation will involve in the anonymous all-employee survey at Ringnes.

Who is responsible for the research project?
The Norwegian University of Life Science (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are requested to complete this survey because you are an employee at Ringnes. It does not matter which department you belong to or position you have.

What does participation involve for you?
If you chose to take part in the project, you will answer 'I agree' and complete the survey. We have compiled a list of five key challenges from our expert panel and are seeking opinions of the greater employee base at Ringnes for which they believe are the most challenging.

Participation is voluntary:
Participation in the project is voluntary. If you do choose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy and storage of personal data:
We will not collect any identifying information about employees.

Where can I find out more?
The full results of the research will be available approximately in May 2019. If you have question contact:
via Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor

If you agree to participate in our survey, please select 'I agree' in the survey:
https://forms.gle/fubfaEVtPR7tQMPi8

10.3.2. R3 Questionnaire Guide

Sustainability Survey: Ringnes

Welcome to our student project on the sustainability of the transportation sector at Ringnes. Please complete it by Tuesday, 7th of May 2019.

It will take approximately one minute, and encompasses just one question. Here we are asking all employees to choose what they perceive as the main challenge to sustainability in the transportation sector at Ringnes.

If you have any questions or concerns please contact:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor
Thank you for your time!

Velkommen til prosjektet vårt om bærekraft i transportsektoren hos Ringnes. Vær vennlig å gjennomføre undersøkelsen innen tirsdag 7. mai 2019.

Denne vil ta omtrent ett minutt å gjennomføre, og inneholder bare ett spørsmål. Vi spør alle ansatte om å velge det alternativet som dere ser på som hovedutfordringen i transportsektoren i Ringnes.

Har du noen spørsmål angående undersøkelsen, ta gjerne kontakt:
Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – veileder
Tusen takk for at du tok deg tid til å besvare undersøkelsen!

10.3.3. R3 Questionnaire

Sustainability Survey: Ringnes

Q1. I have read the information provided in the Ringnes Survey Guide (https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing) and agree to participate in this survey.

Jeg har lest og forstått informasjonen i "Ringnes Survey Guide" https://drive.google.com/file/d/15mWw8u4rmaWSsmEUrUT2FznCauXEFCty/view?usp=sharing), og ønsker å delta i denne undersøkelsen. Dersom du ønsker å få tilsendt informasjonen i "Ringnes Survey Guide" på norsk, ta gjerne kontakt med oss.

- ☐ Yes/Ja
- ☐ No/Nei

Q2. What do you perceive as the biggest challenge to improving sustainability in transportation/distribution at Ringnes? Please select only one from the categories below.

Hva ser du på som den største utfordringen for å gjøre transport og distribusjon mer bærekraftig i Ringnes? Velg nøyaktig en av kategoriene nedenfor.

- ☐ Lack of investment or cutting costs (i.e. into new technology/processes)
  Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

- ☐ Lack of alternative transportation (i.e. train or other supplementary transportation)
  Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

- ☐ Old or underdeveloped technology (i.e. fuel types, engines, and tires)
  Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

- ☐ Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
  Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

- ☐ Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
  Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

10.3.4. R3 Questionnaire Results & Coding

Votes

Category	Number of Votes
#1) Lack of investment or cutting costs	**4**
#2) Lack of alternative transportation	**3**
#3) Old or underdeveloped technology	**4**
#5) Inefficient route planning or logistics	**4**
#6) Poor infrastructure	**7**

N=22 (1 vote per N)

Coding

#1) Lack of investment or cutting costs (i.e. into new technology/processes)
Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)

#2) Lack of alternative transportation (i.e. train or other supplementary transportation)
Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)

#3) Old or underdeveloped technology (i.e. fuel types, engines, and tires)
Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)

#5) Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

#6) Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)

10.4. Background Interview

10.4.1. Interview Information

Thank you for your interest in being our expert interview!
**"Environmental CSR in Norway's Beverage Industry:
A Case Study of Ringnes' Transportation Sector"**

Dear Interview Participant,
We are a group of master's students (Hannah Marie Hernandez, Anna Löfvenius, Kristin Sørbøen Gåsbakk, and Hilde Grønlien) in International Environmental Studies at the Norwegian University of Life Sciences (NMBU). This project is for one of our courses, Environmental Management and Sustainability Reporting (BUS311). Under the supervision of Prof. Ståle Navrud, we are conducting research into the sustainability of the beverage industry in Norway with a special focus on the transportation and distribution sector at Ringnes. Largely using the Corporate Social Responsibility framework, our project is investigating the challenges Ringnes faces in making this sector more sustainable. Below we will provide information about what your participation will involve.

Who is responsible for the research project?
The Norwegian University of Life Science (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are requested to be our 'expert interview' because you are considered to be directly responsible/related to some of the topics discussed in our paper.

What does participation involve for you?
Participation in the project is voluntary. If you do choose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw. Participation will involve the signing of the consent form as well as responding to our email-interview questions. You may choose to disregard and/or abstain from answering any questions asked in part or in whole.

How will your data be used?
We have compiled a list of five key challenges from our 'expert panel' survey and are seeking your opinion through an 'expert interview' on possible solutions to these challenges. The data collected will be your responses to our questions and, unless you wish to remain confidential and do not give consent in the form, your name and position at Ringnes. Your responses will be used to facilitate discussion in our paper and provide 'expert' insight alongside our recommendations.

Your personal privacy and storage of personal data:
If you chose to take part in the project, you will need to sign the consent form and select if you wish to be kept confidential or not. If not, we will collect: your full name and employment title and these may be associated with your responses. We will treat your personal information securely and in accordance with the rules of the Norwegian Centre for Research Data.

What will happen to your personal data at the end of the research project?
So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. If you agree to participate in our interview, you will please sign the following consent form.

Where can I find out more?
We expect the full results of the research will be available in June 2019. If you have question contact:
via Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor

10.4.2. Consent Form

Norwegian University of Life Sciences

"Environmental CSR in Norway's Beverage Industry: A Case Study of Ringnes' Transportation Sector"

CONSENT TO TAKE PART IN RESEARCH

Consent Form

I have received and understood information about the project *Environmental CSR in Norway's Beverage Industry:A Case Study of Ringnes' Transportation Sector* and have been given the opportunity to ask questions. I give consent:

- ☒ to participate in an email-interview
- ☒ for information about to be used in a way that I can be recognised, i.e. indicating my name, profession and/or location of employment

I give consent for my personal data to be processed:

Einar A. Gundersen 7/5-19

(Signed by participant, date)

EINAR A. GUNDERSEN

(Printed full name I wish to be used in the paper)

NATIONAL TRANSPORT AND DISTRIBUTION MANAGER

(Printed position/employment title I wish to be used in the paper)

10.4.3. Interview Guide

E-mail Interview with Mr. Einar Gundersen (Ringnes):

Hi Einar!

Thank you very much for agreeing to answer a few of our questions. Unfortunately, we need to complete our paper by Thursday and it will be easier if we do not need to transcribe the data. Do you think it would be okay to respond to our questions via email? You can be as brief or detailed as you feel comfortable with. If possible, could you answer the questions below and then if there is something we do not understand we can have a brief follow-up with a call at 17:30 (if you have time)? Please let us know if this does not work for you.
We really apologise for the short notice and urgency.

We have prepared the following questions:

1. How many trucks does Ringnes have in total?

2. For 2016, 2017, and 2018 (if available): what are the emissions from transport/distribution, as well as the total emissions from Ringnes? Could you also please elaborate on the total distance driven (page 15 of the sustainability report)?

3. Could you elaborate briefly on the relationship of Ringnes to Carlsberg (specifically on things like priority setting or the level of autonomy from Ringnes has to make its own decisions for things like sustainability goals and to track its own progress etc.

4. What is the rationale for not using electric trucks/vans for inner city delivery?

5. What are the KPIs for drivers/sustainability training? What kind of training is this and is it given regularly? Is there follow-up or progress tracked in some way?

If you don't mind responding written via email: We have attached the necessary forms so that we can include the data in our paper. Please sign the consent form and indicate if you wish to be kept confidential to the data. Thank you so much for all your help with this!!

Hannah, Hilde, Anna, and Kristin

10.4.4. Interview Results

Date of Interview: 07 May 2019

Responses from Einar Gundersen	
QUESTION	RESPONSES
1. How many trucks does Ringnes have in total?	Currently we have 130 trucks.
2. For 2016, 2017, and 2018 (if available): what are the emissions from transport/distribution, as well as the total emissions from Ringnes? Could you also please elaborate on the total distance driven (page 15 of the sustainability report)?	Unfortunately we don't have reliable data on this due to different system changes. Estimated km driven for 2018 is 4,5 million. Average fuel consumption was 34,50 pr 100 km.
3. Could you elaborate briefly on the relationship of Ringnes to Carlsberg (specifically on things like priority setting or the level of autonomy from Ringnes has to make its own decisions for things like sustainability goals and to track its own progress etc.	Most of goals and KPI's are coming from Carlsberg (Supply Chain) centrally. When we invest (or lease) new trucks we do it locally with the support from central team. As long as decisions support our commend goals, local initiatives are apricated.
4. What is the rationale for not using electric trucks/vans for inner city delivery?	So far electric trucks with sufficient pay-load and range are not available (our goods is quite heavy), but we follow the development closely. We currently have a beer-drive truck for delivery shortly with Bio-gas engine.
5. What are the KPIs for drivers/sustainability training? What kind of training is this and is it given regularly? Is there follow-up or progress tracked in some way?	We track daily driver behavior, and measure different KPI's. The drivers get weekly feedback on their performance. We measure: Harsh breaking, Green band driving, Combined coasting and Overspeed – with a scale of A-G (see picture below).

SELECT A VEHICLE GROUP FOR DETAILS		RATING VALUE	COMBINED COASTING	GREEN BAND DRIVING	HARSH BRAKING	OVER SPEED
GROUP AVERAGE	B	2.12	B	B	B	B
1. Vest 2	A	1.29	A	B	A	A
2. MidtNord	B	1.65	B	A	A	C
3. Oestre Oestland 1	B	1.77	B	B	A	B
4. Oestre Oestland 2	B	1.87	B	A	B	C
5. Soer	B	1.94	C	B	A	A
6. Vestre Oestland 2	C	2.94	D	C	B	B
7. Vestre Oestland 1	C	3.42	F	C	B	A

10.5. Expert Interview

10.5.1. Interview Information

Thank you for your interest in being our expert interview!
"Environmental CSR in Norway's Beverage Industry:
A Case Study of Ringnes' Transportation Sector"

Dear Interview Participant,
We are a group of master's students (Hannah Marie Hernandez, Anna Löfvenius, Kristin Sørbøen Gåsbakk, and Hilde Grønlien) in International Environmental Studies at the Norwegian University of Life Sciences (NMBU). This project is for one of our courses, Environmental Management and Sustainability Reporting (BUS311). Under the supervision of Prof. Ståle Navrud, we are conducting research into the sustainability of the beverage industry in Norway with a special focus on the transportation and distribution sector at Ringnes. Largely using the Corporate Social Responsibility framework, our project is investigating the challenges Ringnes faces in making this sector more sustainable. Below we will provide information about what your participation will involve.

Who is responsible for the research project?
The Norwegian University of Life Science (NMBU) is the institution responsible for the project.

Why are you being asked to participate?
You are requested to be an 'expert interview' because you are considered to be directly responsible/related to some of the topics discussed in our paper.

What does participation involve for you?
Participation in the project is voluntary. If you do choose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw. Participation will involve the signing of the consent form as well as responding to our email-interview questions. You may choose to disregard and/or abstain from answering any questions asked in part or in whole.

How will your data be used?
We have compiled a list of five key challenges from our 'expert panel' questionnaire and are seeking your opinion through an 'expert interview' on possible solutions to these challenges. We may also ask additional questions. The data collected will be your responses to our questions and, unless you wish to remain confidential and do not give consent in the form, your name and position at Ringnes. Your responses will be used to facilitate discussion in our paper and provide 'expert' insight alongside our recommendations.

Your personal privacy and storage of personal data:
If you chose to take part in the project, you will need to sign the consent form and select if you wish to be kept confidential or not. If not, we will collect: your full name and employment title and these may be associated with your responses. We will treat your personal information securely and in accordance with the rules of the Norwegian Centre for Research Data.

What will happen to your personal data at the end of the research project?
So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. If you agree to participate in our interview, you will please sign the following consent form.

Where can I find out more?
We expect the full results of the research will be available in June 2019. If you have question contact:
via Hannah Marie Hernandez – hannah.marie.hernandez@nmbu.no – student
Prof. Ståle Navrud– stale.navrud@nmbu.no – supervisor

10.5.2. Consent Form

Norwegian University of Life Sciences

"Environmental CSR in Norway's Beverage Industry: A Case Study of Ringnes' Transportation Sector"

CONSENT TO TAKE PART IN RESEARCH

Consent Form

I have received and understood information about the project *Environmental CSR in Norway's Beverage Industry: A Case Study of Ringnes' Transportation Sector* and have been given the opportunity to ask questions. I give consent:

- ☒ to participate in a phone-interview
- ☑ that the phone-interview can be recorded
- ☒ for information to be used in a way that I can be recognised, i.e. indicating my name, profession and/or location of employment alongside my answers

I give consent for my personal data to be processed:

[signature], 9/5-2019
(Signed by participant, date)

SANDRA MYSTERUD
(Printed full name I wish to be used in the paper)

CSC DIRECTOR
(Printed position/employment title I wish to be used in the paper)

10.5.3. Interview Guide

Phone Interview with Mr. Sondov Øystese (Ringnes):

1. We would like to know more about your solutions and approaches to five challenges that came up in the completed survey. If there are something that you are wondering throughout the interview, just ask us for clarifications. These are the challenges we want to know your thoughts about:

> Q1. Lack of investment or cutting costs (i.e. into new technology/processes)
> Mangel på investering eller kutte kostnader (f.eks ny teknologi/prosesser)
>
> Q2. Lack of alternative transportation (i.e. train or other supplementary transportation)
> Mangel på alternativ transport (f.eks tog eller andre supplerende transportsmidler)
>
> Q3. Poor infrastructure (i.e. bad road conditions or systematically bad traffic)
> Dårlig infrastruktur (f.eks dårlige veier eller mye trafikk)
>
> Q4. Old or underdeveloped technology (i.e. fuel types, engines, and tires)
> Gammel eller underutviklet teknologi (f.eks drivstofftyper, motor og dekk)
>
> Q5. Inefficient route planning or logistics (i.e. a lack of customer flexibility or cannot otherwise drive the shortest routes)
> Ineffektiv ruteplanlegging eller logistikk (f.eks mangel på forbrukerfleksibilitet eller kan ikke kjøre den korteste ruten)

2. We would also like to know more about the relationship between Carlsberg and Ringnes.

3. Lastly, is there anything more you would like to add, such as further solutions or challenges that we have not listed?

10.5.4. Interview Results

Date of Interview: 09 May 2019

As the interview was conducted in Norwegian, the researcher notes and transcription are also presented below in Norwegian.

Researcher Notes from Interview with Sondov Øystese (på Norsk: Telefon intervju med Sondov Øystese – 09.05.2019)
Vi ønsker å vite dine tanker om noen mulige løsninger eller tilnærminger i forhold til fem utfordringer (som har kommet opp gjennom vår survey). (#1)
SPORSMÅL: Mangel på investeringer eller kutte kostnader (f. eks i ny teknologi) SVAR: o Vi skal bytte ut alle bilene så de har Euro VI motorer, så vi har investeringsvilje sånn sett, men det vi sliter med er å finne mer miljømessig riktig måte å gjøre ting på. Og da er noe av problemet med den teknologien som finnes i dag. o Hadde vi hatt et godt alternativ til dieselbil i dag kunne vi hatt det. Det er vel ingen som kjører varer med el-biler eller distribusjonsbiler i dag. Men det er noen som har bestilt, for eksempel Schenker, som har sykkelvarebiler (3 stk, med et lite skap bak) (varebil-distribusjon i sentrum av Oslo) og elektriske varebiler o Vi har cirka 550 kilo per pall som vi kjører ut, med 18 paller, noe som gjør det vanskelig å bruke slik distribusjon. Vi har ikke sjans til å få dette med i varebilene eller sykkel. o «Vi optimaliserer ut fra de rammebetingelsene som vi har i dag med Euro VI motorer som vi ser på som vi er kjent med, også venter vi (ift Carlsberg) med leverandører av elektriske biler. Men vi har ikke greid å gjøre det konvensjonelt i dag» o I dag har vi cirka 10 stopp per døgn med såpass mange tonn per leveranse på en rute, at vi ikke greier å gjøre det effektivt med el-lastebil, med dagens teknologi. Men om 5-10 år så er det helt sikkert muligheter. Og derfor har vi kortsiktig licing avtaler så vi er fleksible hvis teknologien utvikler seg. o Ny teknologi og fremgang med el-kjøretøy. Vi har prøvd biodiesel og det har heller ikke vært effektivt. Men det er den dagen hvor el har nok trekkraft og tar den lasten vi trenger, også har vi også selv-kjørende biler, men den måten vi distribuerer på (at vi laster mye inn og ut) er det ikke egna for den distribusjonen vi gjør. o Den vi har mulighet, bruker vi tog. Så det å få større tog kapasitet, spesielt Molde – Ålesund (Raumabanen som de stengte for godstransport i desember i fjor) er typiske forbedringsmuligheter vi har. Det er kanskje et av de overraskende at man ikke satser mer på tog, selvfølgelig er det kostnader og får minus de godsselskapene, men den miljømessige biten og belastningen på miljøet er rart de ikke gjør noe mer med.

SPORSMÅL:
Mangel på alternativ transport (f. eks tog, skip eller annen transport)

SVAR:

- Før hadde vi mer bruk for skip og båt, da hadde vi godsruter langs kysten for hermetikken de distribuerte. Men kravene i dag til ledetiden til de har varene til og kampanjen som svinger mer. Båttransport er derfor ikke fleksibelt nok.
- Men tog er absolutt noe vi kunne ha brukt mer av, da kunne vi også ha optimalisert kjøringen ned til togstasjonen fordi det er avstand til stasjonen. Eventuelt det kunne vært elektriske biler som kjører ned til toget, og toget tok da i større grad varene. I dag er det begrensinger på togplasser og vi må bestille togplasser spesielt i høysesongen, så får vi ikke så mange plasser som vi ønsker, for eksempel til Bergen, Trondheim eller Stavanger.
- Så var det Raumabanen som jeg snakka om istad, den ønsker vi å få åpna opp igjen. Kostnadsmessig og miljømessige årsaker, fordi nå kjører vi semitrailere opp til Molde og Ålesund.
- Hvor mye bruker dere tog nå? Vi bestiller såkalte togplasser så nå skrur vi opp togplassene men i tidsperioder bruker vi også biltransport fordi vi har ikke nok kapasitet til tog. Også har vi infrastruktur som spiller inn, (Bodø, Trondheim, Fauske) der er det makslenge på tog (150 meter eller noe lignende). Så infrastruktur spiller en rolle på hensyn som må tas. Men det er noe som må gjøres med satsingen på tog sånn generelt.

SPORSMÅL:
Dårlig infrastruktur (f. eks dårlige veier eller trafikk)

SVAR:

- Det er ikke så mye som vi kan få gjort med, men vi prøver å være med i utvalg (som Stor Oslo prosjektet – alliansen som vi er med på). Så vi er med på å få det inn i Nasjonal transportplan (som er en 6-8 års syklus), men dette er langvarige prosesser hvor de tidligst på midten av 2020 tallet som Nasjonal transportplan skal oppdateres og få inn riksvei 4 (noe som gjelder Gjelleråsen, noe han tror blir rundt 2024 på Gjelleråsen). Stor Oslo prosjektet må først komme inn i nasjonal transportplan før det kan gjøres noe, og om de er interessert i å ha dette med der, og deretter skal det prioriteres.
- Den 21. mai skal det være et foredrag/seminar hvor lederen i Stortingets transport og kommikasjonskomitee kommer. Det er Stor Oslo som arrangerer det, og da er det flere bedrifter langs riksvei 4 ved Raufoss som er med. Ringnes skal også være med. Alle bedrifter som ligger ved Gjelleråsen og nordover langs riksvei 4 er partnere. (Vet du hvor mange som er der?) De som var med oss var de største som var invitert (hovedsakelig tre stk: Diplom-is, Fifth og Ringnes)
- Jarle (prosjektleder)

SPORSMÅL:
Gammel eller underutviklet teknologi (f. eks drivstoff, motor og hjul)

SVAR:

- Det vi har hatt er gamle biler (med gammel teknologi). Vi har ikke hatt euro 6 før vi begynte å bytte de ut nå. Vi har en utskiftningsplan på stort sett alle bilene våre. I 2020, har vi byttet ut alle bilene våre til å ha Euro 6 motorer. Dette har vi fått godkjent, men det tar litt tid å få inn disse bilene.
- Vi har cirka 130 egne biler
- Det vi også har gjort, er at i fjor, så bytta vi ut slik at vi har 4 sittiserier med 30 palleplasser. Som er et miljøtiltak, hvor det er flere palleplasser på en bil. Hvis det kjøres to biler til en destinasjon (Ås og sørover) kan vi kjøre en og den tar et større område fordi den har dobbelt kapasitet i forhold til de andre vi har.
- Kanskje vi er litt konservative i tenkemåten vår, ellers har vi ingen referanser. Vi sammenligner og samarbeider med andre Carlsberg-land hvor de har en grossist distribuert, men sånn som Bazel i Sveits, jobber de med elektriske lastebiler. Men igjen så er det distansen de kan kjøre og lasten de kan ha med som er begrensinger som er i dag. Derfor vi følger med leverandørene våre, både her i Norge, i Carlsberg og ellers.

SPORSMÅL:
Trafikk-logistikk og planlegging er ikke så effektiv (f. eks kan ikke kjøre den korteste ruten)

SVAR:

- Vi lager det vi kaller «perfect plan» som vi optimaliserer. Men det kan være køer, eller andre forsinkelser som gjør at vi får avvik, så da bruker vi lengre kjøretid og det blir mer utslipp, og selvfølgelig blir det en kostnad med det og klager fra kundene fordi vi ikke treffer på de tidslinjene som vi har avtalt. Vi forskyver arbeidstiden noe, hvis mange av bilene kjører ut klokka seks ut fra Gjelleråsen, så er ikke køen kommet enda. Med veier uten større køer, kunne vi hatt større fleksibilitet.
- Håper at Stor Oslo prosjektet kan være med på å gjøre noe med dette problemet. Men ser at det kan skje ganske lang tid i fremtiden. Vi har optimaliseringsprogram men vi skal bytte det ut i løpet av årsskiftet for å få et enda bedre brukervennlig og simuleringsvennlig bytteoptimaliseringsverktøy

Tilleggsspørsmål (#2 and #3)
SPORSMÅL: Carlsberg (relasjon) SVAR: o Noenlunde lik sustainability report, men går det å lage egne kriterier eller må dere følge deres mål? Vi er en del av en storfamilie og må derfor rette oss til hva dem gjør. Vi har et hovedmantra om at vi skal minimum være lik det Carlsberg setter som retningslinjer (guidelines) eller bedre. o Den nye rapporten skal legges fram i slutten av mai 2019, også kommer vi til å være mer tydelige på ambisjonene våres med plast og reduksjon av plast. Mest fokus på det med klarere målsetting og strategier, fordi vi har ikke vært så tydelige på dette i tidligere rapporten. Coca cola har hatt enda mer fokus på dette enn oss, som har sagt hvor mange tonn de bruker, men det har ikke Ringnes gjort (noe som de skal gjøre i neste rapport). Litt mer om hvilke ambisjoner vi har og hvilke tiltak vi har, vi vil ikke si at vi skal redusere plastforbruker vårt i 2025 uten å ha klare ambisjoner og tiltak bak dette, fordi ellers blir det bare lovnader uten ord, så kommer vi til 2025 og vi må stå opp for det. o Vi har vår CSR avdeling (3 stk, eks: Nicolay, Nils) de som jobber tett mot Carlsberg. Men det er ikke noe at vi skal ditt eller skal ditt, men vi har lov til å gjøre ting hvis vi argumenterer godt for det. Men som regel så er vi minimum likt eller bedre enn det Carlsberg sier.
SPORSMÅL: Har du noen andre utfordringer som ikke er nevnt? SVAR: Personaltransport: o Dårlig alternativ transport. Bussene er ofte forsinka og lite frekvent. Vi har ikke tog til Gjelleråsen. Så det er en problemstilling å tenke på og som kan bedre utvikles. Key findings: kan reises som et problem fra Ringnes som kan jobbes videre med. 1) Bedre veier og baner. o Vi sliter litt med rekruteringen fordi vi er litt langt ut på bygden og det er ikke noe god offentlig kommunikasjon. Samtidig, så er vi en av de få industriplassene som er nærme Oslo sentrum, derfor spennende å drive med industri. o Elektriske biler for personale er diskutert, og de har ladestasjoner for deres ansatte (Hovedsakelig 16, men 25 stk, inkludert gjesteplassene de har). Vi har sagt at ved behov så kan det dobles til 32 ladestasjoner, men så langt har vi ikke sett noe behov. Men når de fornyer bilparken sin, blir hybrid, så da blir det også litt andre behov. For eksempel Coca Cola har en mer policy om at de skal ha elektriske firmabiler.

10.6. Norwegian Centre for Research Data Approval

NSD NORSK SENTER FOR FORSKNINGSDATA

NSD sin vurdering

Prosjekttittel

Environmental CSR in Norway's Beverage Industry: A Case Study of Ringnes' Transportation Sector

Referansenummer

573838

Registrert

08.04.2019 av Hannah Marie Hernandez - hannah.marie.hernandez@nmbu.no

Behandlingsansvarlig institusjon

Norges miljø- og biovitenskapelige universitet / Fakultet for landskap og samfunn / Institutt for internasjonale miljø- og utviklingsstudier

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Ståle Navrud, stale.navrud@nmbu.no, tlf: 67231142

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Hannah Marie Hernandez, hanherna@nmbu.no, tlf: 48596091

Prosjektperiode

01.02.2019 - 31.05.2019

Status

08.05.2019 - Vurdert

Vurdering (1)

08.05.2019 - Vurdert

Our assessment is that the processing of personal data in this project will comply with data protection legislation, presupposing that it is carried out in accordance with the information given in the Notification Form and attachments, dated 08.05.2019, as well as dialogue with NSD. Everything is in place for the processing to begin.

NOTIFY CHANGES
If you intend to make changes to the processing of personal data in this project it may be necessary to notify NSD. This is done by updating the information registered in the Notification Form. On our website we explain which changes must be notified. Wait until you receive an answer from us before you carry out the

changes.

TYPE OF DATA AND DURATION
The project will be processing general categories of personal data until 31.05.2019.

LEGAL BASIS
The project will gain consent from data subjects to process their personal data. We find that consent will meet the necessary requirements under art. 4 (11) and 7, in that it will be a freely given, specific, informed and unambiguous statement or action, which will be documented and can be withdrawn. The legal basis for processing personal data is therefore consent given by the data subject, cf. the General Data Protection Regulation art. 6.1 a).

PRINCIPLES RELATING TO PROCESSING PERSONAL DATA
NSD finds that the planned processing of personal data will be in accordance with the principles under the General Data Protection Regulation regarding:

- lawfulness, fairness and transparency (art. 5.1 a), in that data subjects will receive sufficient information about the processing and will give their consent
- purpose limitation (art. 5.1 b), in that personal data will be collected for specified, explicit and legitimate purposes, and will not be processed for new, incompatible purposes
- data minimisation (art. 5.1 c), in that only personal data which are adequate, relevant and necessary for the purpose of the project will be processed
- storage limitation (art. 5.1 e), in that personal data will not be stored for longer than is necessary to fulfil the project's purpose

THE RIGHTS OF DATA SUBJECTS
Data subjects will have the following rights in this project: transparency (art. 12), information (art. 13), access (art. 15), rectification (art. 16), erasure (art. 17), restriction of processing (art. 18), notification (art. 19), data portability (art. 20). These rights apply so long as the data subject can be identified in the collected data.

NSD finds that the information that will be given to data subjects about the processing of their personal data will meet the legal requirements for form and content, cf. art. 12.1 and art. 13.

We remind you that if a data subject contacts you about their rights, the data controller has a duty to reply within a month.

FOLLOW YOUR INSTITUTION'S GUIDELINES
NSD presupposes that the project will meet the requirements of accuracy (art. 5.1 d), integrity and confidentiality (art. 5.1 f) and security (art. 32) when processing personal data.

To ensure that these requirements are met you must follow your institution's internal guidelines and/or consult with your institution (i.e. the institution responsible for the project).

FOLLOW-UP OF THE PROJECT
NSD will follow up the progress of the project at the planned end date in order to determine whether the processing of personal data has been concluded.

Good luck with the project!

Contact person at NSD: Karin Lillevold
Data Protection Services for Research: +47 55 58 21 17 (press 1)