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Drivers and Challenges of the Science Based Targets Initiative

**Mapping the Achievability Challenges of Science Based Targets in Swedish
Transport-Reliant Industries, and Identifying the Drivers of Its Adoption**

Bachelor's thesis in Technology Management and Economics

IDA CLAEISSON
SOPHIE JOON
CARL LINGSTRÖM

AXEL HELGESSON
JONATHAN KRANTZ
ZIGGE SOMMAR

**DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF SCIENCE, TECHNOLOGY AND SOCIETY**

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Drivkrafter och Utmaningar med Science Based Targets Initiative

En Kartläggning av Utmaningarna för att Uppnå Science Based Targets i Svenska Transportberoende Industrier och Drivkrafter bakom dess Åtagande

IDA CLAEISSON
SOPHIE JOON
CARL LINGSTRÖM

AXEL HELGESSON
JONATHAN KRANTZ
ZIGGE SOMMAR

TEKNIKENS EKONOMI OCH ORGANISATION
Avdelningen för Industriell Ekonomi
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Bachelor's thesis TEKX18-VT24-19
DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
Chalmers university of technology
412 96 Gothenburg
Sweden
Phone + 46 (0)31-772 1000

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ZIGGE SOMMAR

Department of Technology Management and Economics

Chalmers University of Technology

ABSTRACT

The challenging nature of achieving Science Based Targets (SBTs) implies that companies must have compelling reasons for their voluntary commitments. In achieving such ambitious targets, companies encounter significant challenges in reducing emissions, particularly in specific sectors like road transportation. This thesis aims to understand the drivers behind commitments and the challenges faced by Swedish companies with these targets. The data was collected through 16 semi-structured interviews. These interviewees were categorized into four groups: manufacturers, customers of transportation, haulage contractors, and experts. Findings indicate that corporate commitments in the studied sector are primarily driven by strategic considerations, including market competitiveness, anticipation of future regulatory change, and stakeholder pressure. Key challenges for transport include technical and infrastructure limitations to leverage zero-emission technologies, total cost of ownership and operation combined with the need for defined and supportive policy and market environments. The findings underscore the necessity for targeted policies and industry support from customers of transportation to achieve emission reduction challenges. It also suggests shared stakeholder responsibility in enhancing corporate contributions to global climate goals.

Keywords: Science Based Targets Initiative (SBTi), Science Based Targets (SBTs), Zero Emission, Sustainable Transportation, Total Cost of Ownership (TCO)

Note: The thesis is written in English

SAMMANFATTNING

Att åta sig Science Based Targets (SBTs) är en utmanande uppgift som kräver att företag har grundade skäl för detta frivilliga åtagande. När företag strävar efter att nå sådana ambitiösa mål möter de betydande svårigheter, särskilt inom specifika sektorer så som vägtransport. Denna studie syftar till att förstå drivkrafterna bakom företagens åtaganden och de utmaningar som svenska företag möter i samband med dessa mål. Data samlades in genom 16 semi-strukturerade intervjuer och intervjupersonerna delades in i fyra grupper: tillverkare, transportköpare, åkerier och experter. Resultaten pekar på att företagens åtaganden inom den studerade sektorn främst drivs av strategiska drivkrafter, såsom marknadskonkurrens och förväntningar på framtida regeländringar, samt påtryckningar från intressenter. De största utmaningarna för transportsektorn inkluderar tekniska och infrastrukturella hinder för att anta nollutsläppstekniker, ägande- och driftkostnader, samt behovet av tydliga och stödjande policy- och marknadsförhållanden. Resultaten understryker vikten av riktade policys och branschstöd från köpare av transportlösningar för att tackla utmaningarna med att minska utsläppen. Det föreslås också ett delat ansvar för att förbättra företagens insatser för att uppnå globala klimatmål.

Nyckelord: Science Based Targets Initiative (SBTi), Science Based Targets (SBTs), Nollutsläpp, Hållbara Transporter, Total Ägandekostnad (TCO)

Notera: Rapporten är skriven på engelska

Preface

This Bachelor's thesis was carried out in the spring of 2024 at the Department of Technology Management and Economics at the Division of Science, Technology and Society at Chalmers University of Technology in Gothenburg, Sweden. The work comprised 15 credits and was the final part of the bachelor's degree within the 5-year master's program.

We express our gratitude to all individuals and companies who participated in the interviews. Your contributions have provided valuable insights and intriguing perspectives, crucial for our comprehension of the subject. Without your participation, this report would not have been possible.

Finally, we would like to thank our supervisor, Nicolas Surber, a Doctoral Student at the Division of Science, Technology, and Society, for his constant support and for providing thought-provoking and helpful advice throughout this project.

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1. Introduction

1.1 Background

To mitigate the effects of ongoing climate change, various global climate goals have been established. The most notable of these is the 2015 Paris Agreement, which calls for a joint effort to keep global warming under 2 °C (Andersen et al., 2020). The Science Based Targets Initiative (SBTi) translates the temperature goal of the Paris Agreement into company-level greenhouse gas (GHG) emission reduction commitments. It does so by focusing on ensuring that corporate goals for reducing carbon emissions align with those of the Paris Agreement. Science Based Targets (SBTs) are formulated using a shared pool of resources and methodologies for setting targets to achieve this. The targets, as well as the companies undertaking them, are then evaluated and validated by an independent technical advisory group (Andersen et al., 2020). Additionally, SBTs are built on a standardized framework called the GHG Protocol (World Business Council for Sustainable Development and World Resources Institute, 2004). The GHG Protocol defines how to measure CO₂ emissions and divide the emissions into three scopes/areas called scope 1, 2, and 3.

Companies voluntarily committed to the SBTi and with goals aligned with the Paris Agreement are according to Nejadi et al. (2021) confronted with several challenges. Besides the viability of actual target achievement in terms of technical prerequisites, the author suggests another challenge in maintaining stakeholder trust after the SBTi commitment. Nejadi further implies that the credibility and reputation of companies may erode if they fail to live up to the climate goals. On the other hand, stakeholder pressure on climate responsibility will see damaging effects on company image and market positioning in the long term following a lack of commitment. Grand View Research (2020) suggests further commercial and financial incentives and challenges. Their research argues that the introduction of such targets will require investment and corporate operational rearrangement in the firm, damaging both cost and revenue in the short term. Transitioning to meet SBTs in line with the Paris Agreement's long-term goals will therefore need short-term financial sacrifices and strategic planning to ensure future competitiveness.

Renné (2022) further elaborates on this point and states that achieving net-zero emissions presents several challenges that require a transformative approach across multiple sectors. The author underscores the necessity of scaling up renewable energy technologies and the need for robust policy frameworks and accessible low-cost financing to support this transition. Furthermore, Renné claims that technological advancements are essential for improving renewable energy efficiency and integrating high shares of variable renewable energy into the power grid. Moreover, global coordination is vital to ensure effective technology sharing, financing, and environmental management. The author also emphasizes the transformation of the transportation sector as an integral part of achieving net-zero emissions

The role of transportation is further highlighted by the European Environment Agency, which notes that a total of 3.3 trillion tonne-kilometers (tkm, one tonne of goods transported over a distance of one kilometer) were transported in the EU-27 in 2019. From 2000 to 2019, the total freight volume increased by 23%. During the same period, from 2000 to 2019, the share of road transport rose from 48.7% to 52%, mirroring the growth rate of the overall economy, but notably surpassing all other forms of freight transport in terms of expansion in overall freight share (Transport and Environment Report 2022, 2023). This underscores the growing demand for sustainable transport, prompting Renné (2022) to advocate for a substantial increase in the decarbonization of transportation. In addition, the Mission Possible Partnership, an alliance made up of the World Economic Forum, RMI, We Mean Business Coalition, and Energy Transitions Commission, expects a considerable increase in demand in the Chinese, European, North American, and Indian markets for trucks and for road logistics through 2050. Their projections suggest a doubling in demand, going from 12 trillion tkm to 26 trillion tkm. The increase in demand with the continuation of current fuel usage will result in an increase of emissions from 1.5 gigatons to 3 gigatons of CO₂ in the same regions. Reducing emissions with rising demand will also require many new parameters including infrastructure, operating costs and technical conditions (Mission Possible Partnership, 2022).

In the EU-27 region, however, overall GHG emissions showed a 24% decrease during the period from 1990 to 2019. The share attributed to transport grew by 33% in the same period, despite a shift towards more efficient combustion engines used in many vehicles for road transportation (Transport and Environment Report 2022, 2023). With the growing proportion of total emissions attributable to transportation in general, and particularly road transport, the immediate need for greener transport and mobility solutions becomes increasingly critical. This includes revamping transport solutions to be more eco-friendly, which is a vital part of reducing overall CO₂ emissions (Grand View Research, 2020). Additionally, existing climate policies directly target the transportation industry. According to the European Council (2014), the European Union's climate and energy policy for 2030 aspires to reduce greenhouse gas emissions by 30%, enhance energy efficiency, and increase the market share for renewable energy sources. The rise in energy consumption, driven by economic growth, significantly contributes to CO₂ emissions, affecting sectors like automotive, technology development, and infrastructure for eco-friendly fuel usage in vehicles. The EU's focus is on curbing emissions, particularly in transportation, where road transport is a major contributor. To address this, the EU aspires to cut transport-related exhaust emissions by 90% by 2050 (Osieczko et al., 2021).

While many challenges are commonly associated with meeting SBTs, the extent, prevalence, and difficulty have yet to be comprehensively mapped. This gap in understanding underscores the need for more detailed research and documentation to fully grasp the complexities and challenges involved in achieving ambitious environmental goals such as the SBTs. Furthermore, the voluntary nature of the initiative provokes inquiries into the motivations behind companies' commitments to such ambitious goals. It is imperative to examine the specific drivers influencing corporate decision-making processes that

counterbalance the hurdles linked to these commitments and mitigate potential adverse outcomes from failing to achieve SBTs, such as the erosion of reputation and credibility. This inquiry necessitates a deeper understanding of how the perceived benefits and strategic advantages of committing to the SBTi might outweigh the risks and complexities involved. Furthermore, challenges such as technological advancements, and financial and operational restructuring, highlight the complexities of successfully implementing these targets. Thus, exploring the key drivers behind companies' commitment to the SBTi and identifying the primary challenges in decarbonizing road transportation is crucial for understanding the connection between economic considerations and environmental responsibility. This exploration into the drivers and challenges will not only highlight the SBTi's effectiveness but also broader implications for global climate policy and corporate sustainability strategies.

1.2 Project Aim

The challenging nature of achieving SBTs implies that companies must have compelling reasons for their voluntary commitments. In achieving such ambitious targets, these companies encounter challenges in reducing emissions, particularly in specific sectors like road transportation (Mission Possible Partnership, 2022). Therefore, the study aims to create a greater understanding of the drivers associated with the adoption and achievement of SBTs and the challenges faced by transport-reliant companies in emissions reduction. This will be done by primarily studying Swedish companies already committed to the SBTi. To recognize the main drivers, the project aims to map and understand strategic, financial, and commercial drivers, as well as stakeholder pressures and regulatory factors influencing the decision to commit to the SBTi.

Concentrating the study on Sweden, a region prominent in both sustainability, SBTi commitment, and truck transport expertise, enhances the relevance and applicability of the findings. This potential extension of significance could benefit a broader global context for regions experiencing similar challenges in the future. According to the Sustainable Development Report (2023), which assesses the sustainability performance of all UN member states, Finland is ranked highest, followed by Sweden. According to Tillväxtanalys (2023), Sweden has many manufacturing companies committed to the SBTi. Given Sweden's longstanding history in specifically truck manufacturing, it serves as a good base for the study, linking sustainability and truck transportation. Additionally, focusing the thesis on Sweden also provides access to a wealth of expertise in sustainable practices and transport technology, supported by the strong commitment of many major corporations to the SBTi.

Extensive research, including studies conducted by Romito et al. (2023), explores the significance of the SBTi in reducing CO₂ emissions. However, a gap in more precise research remains. Investigating the role of the SBTi in driving change in the context of transport solutions prompts further research in the area.

1.3 Problem Definition and Research Question

With initiatives like the SBTi gaining momentum, companies are increasingly making commitments to reducing their GHG emissions (Science Based Targets, n.d.). The difficulty in meeting SBTs suggests that companies have strong motivations for their voluntary commitments. The drivers behind sustainability initiatives on such a high level require an understanding of both the broad and specific environments (Littlewood, 2018). In turn, this prompts research used to build the argument for the research questions, i.e., understanding drivers behind SBTi commitments and challenges in terms of achievability with SBTs related to the emission reduction of road transportation. This research aspires to answer two questions:

RQ 1 What drives Swedish companies reliant on road transportation operations to adopt the SBTi?

RQ 2 What are the biggest challenges related to road transportation emissions reduction in achieving SBTs?

1.4 Delimitations

The scope of the study is confined to the commercial market for road transportation in Sweden. Sweden is an overshoot country, as the demand for ecological resources and services in a given year exceeds what Earth can regenerate, making sustainable development of extra importance (World Wide Fund for Nature, 2020). The companies committed to the SBTi in Sweden are overrepresented by companies active within the manufacturing industry (Tillväxtanalys, 2023). These companies depend on incoming and outgoing goods that require transportation. Additionally, this study focuses on three main stakeholders in the Swedish market for commercial road transportation: customers of transportation, manufacturers of trucks, and haulage contractors. The focus of the project is to understand the present dynamics of the SBTi. To achieve this, it is essential to explore the expectations and plans of key stakeholders in the industry. While the focus remains on the current landscape, researching stakeholders' perspectives and promises made for the future holds significance. This approach seeks to understand the future stakeholders are actively planning for, rather than attempting to forecast the probability of specific outcomes.

2. Methodology

2.1 Data Collection

In this section, the data collection method of the thesis will be outlined. The method involved an interview study conducted through semi-structured interviews to gather relevant data and information. The data collection was analyzed through a narrative analysis, which highlights unified themes and patterns.

2.1.1 Interview Study

Blomkvist and Hallin (2015) state that the reason for gathering empirical data via interviews is that it is possible, by relatively simple means, to learn about how individuals reason in response to different research questions. Interviews are suitable as a research method when there is an interest in developing a deeper understanding of a phenomenon and when there is a desire to discover new dimensions of what is being studied.

Primary data was collected through interviews with companies and experts, which were divided into four groups: manufacturers, customers of transportation, haulage contractors, and experts in sustainable development. This categorization was chosen to ensure a comprehensive understanding of the topic. Manufacturers produce trucks that are purchased by haulage contractors, who then serve as intermediaries between transportation companies and customers needing goods moved. The interconnectedness of these groups is illustrated in Figure 2. To capture perspectives from across the supply chain, interviews were conducted with manufacturers, transportation customers, and haulage contractors, to understand both buyer and seller viewpoints. Additionally, interviews with experts provided broader insights into the industry, the political landscape, and overall market dynamics.

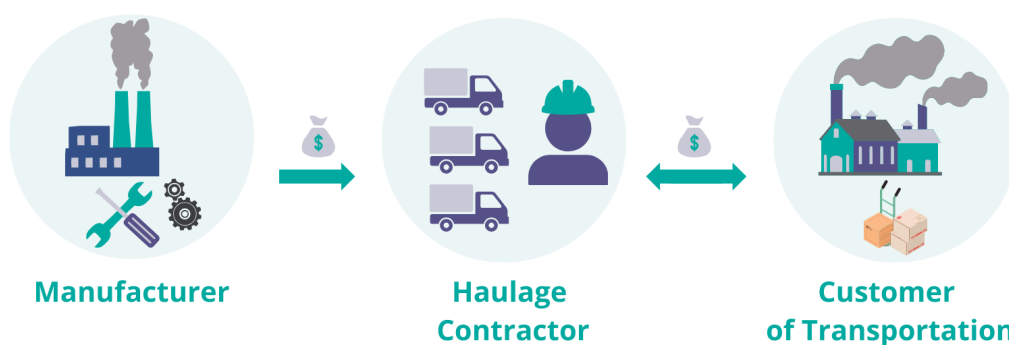


Figure 2: The figure is created specifically for this thesis and illustrates how manufacturers, haulage contractors, and customers of transportation are related.

A semi-structured interview format was utilized in this study, where the interview is organized around several themes or question areas, determined in advance. The flexibility inherent in this approach is essential for the discovery and development of information. The interviewees got the opportunity to expand upon intriguing subjects, a possibility that would not be feasible within a structured interview (Blomkvist & Hallin., 2015).

General report topics were drafted after researching the SBTi and reviewing studies on road transportation and sustainability. The interview questions were developed based on the topics of the study, and different interview guides were then formed, see Appendix A. Separate interview guides were prepared for manufacturers, customers of transportation, haulage contractors, and experts. This was done to ensure that each interview guide and their respective questions were aligned with the specific needs and expertise of each group. The tailored questions aspired to gather in-depth insights into the distinct challenges and perspectives of each participant category. This approach helped in acquiring detailed, relevant information that contributed to the accuracy of the research findings. All questions were prepared beforehand and follow-up questions could then be asked based on the respondent's answers. Thus, the structure could be adjusted during the interviews, starting with general questions and gradually delving deeper into the topic.

The selection criteria were based on companies located in Sweden committed to the SBTi and users of road transportation solutions. Companies committed to the SBTi were found on a list on the SBTi website. A total of 8,442 companies were listed whereas 5,276 of these had approved targets at the start of the interview process. As the report focused on Swedish companies reliant on transportation, the list was filtered to the Swedish region, leaving 368 companies. A review was then conducted to assess if the companies were in a relevant sector, had verified targets, and were transportation-dependent. This resulted in 51 companies, of which everyone was contacted. In addition, interviews were also conducted with experts in the sustainability sector, specifically those with knowledge about the SBTi. The experts were selected due to their knowledge of sustainability and the SBTi. One expert was found due to their published work on the SBTi and the other due to a recommendation from one of the interviewees.

The targeted companies were first contacted via email. Due to a low response rate, it was decided that the contact onwards would be through LinkedIn. This generated a much better response rate and resulted in a total of 16 interviews, as seen in Table 1. Out of these 16 interviews, 14 were with companies of various sizes and business areas, and 2 interviews with experts in corporate sustainability. All contributors were anonymous and will not be mentioned by their name or company. The information in Table 1 includes the assigned anonymous name of the company, the interviewee's field of work at the company, and the date the interview was held. The duration of all interviews was between 25 to 70 minutes.

Table 1. Summary of all 16 conducted interviews presented in 4 categories: manufacturer, customer of transportation, haulage contractor, and expert. The table presents the assigned anonymous name of the company, the interviewee’s field of work at the company, and the date the interview was held.

Company/Organization	Interviewee’s Field of Work	Date
Manufacturer		
M1	Business Development	2024-02-29
M2	Sustainability	2024-04-09
Customer of Transportation		
CT1	Sustainability	2024-03-26
CT2	Sustainability	2024-04-02
CT3	Sustainability	2024-04-02
CT4	Sustainability	2024-04-05
CT5	Sustainability	2024-04-05
CT6	Sustainability	2024-04-08
CT7	Sustainability	2024-04-15
CT8	Sustainability	2024-04-15
CT9	Sustainability	2024-04-22
Haulage Contractor		
HC1	Sustainability	2024-04-11
HC2	Logistics	2024-04-15
HC3	Sustainability	2024-04-17
Expert		
E1	Public Affairs	2024-02-26
E2	Analyst	2024-03-19

The allocation of interviews may appear unevenly distributed, with two manufacturers, nine customers of transportation, and three haulage contractors. The predominance of interviews with transportation customers is due to their high relevance to the study. There are few manufacturers in Sweden and the response rate for haulage contractors was low, hence the low number of interviews with these groups. Since the sampling strategy left 51 companies behind that were contacted, the number of interviews for each group was partly a product of limitation.

Two or three group members participated in the interviews, where everyone was responsible for a couple of questions each, but everyone could interfere with follow-up questions. The interviews were both conducted in person and via Microsoft Teams. All

interviewees consented to be recorded during the interview, enabling post-processing of the material. For the transcription Microsoft Word's function transcribe was used, and afterward, the transcribing was checked and corrected manually.

Three interviews were conducted in English, while thirteen were conducted in Swedish, reflecting the language preference and accessibility of the participants. The decision to conduct interviews in Swedish was made to facilitate clear communication with participants, ensuring that their perspectives and experiences were accurately captured. This necessitated significant effort in navigating between the two languages since the thesis is written in English. After interviews were conducted and transcribed, the contents were analyzed and relevant information for the thesis was carefully translated if the interview was held in Swedish. The translation was done carefully, to not misinterpret important details and overarching themes.

2.2 Data Analysis

The data analysis involved comparing the answers to the interview questions with each other. By comparing the responses, differences, and similarities could be found to identify patterns and homogeneity. This was done by using narrative analysis, as suggested by Harappa (2021). The narrative analysis focused on finding themes and patterns from the data collected from interviews. Harappa (2021), means that narrative analysis is a useful and valuable tool when analyzing different theories and concepts, to build a deeper understanding of the studied subject.

Firstly, themes and patterns were identified from all the interviews to find differences and similarities in the answers. Google Forms was used to find general themes and a simpler overview, where all interview questions from the interview guide were presented and grouped. The answers were summarized when put into Google Forms, which allowed for a good overview of all of the answers. It also aided in generating statistics for simpler questions that could be categorized. A thorough analysis was then further conducted by carefully reviewing each transcription of the interviews. The analysis was conducted in the whole group to leverage the collective experiences and competencies of the entire group. The process from interview to analysis is presented in Figure 2 below.

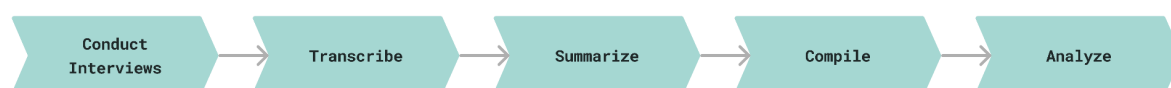


Figure 3: Process flow from conducting the interviews to analyzing data.

The answers were also compared to the literature and themes that were found there. The different themes formed a foundation where it was possible to see patterns and draw conclusions about the subject and research questions.

2.3 Method Critique

The interviews were conducted with Swedish companies of different sizes and business areas, but all were committed to the SBTi. Since the companies were located only in Sweden, the interviews and the results might not be representative of companies from other countries.

In some instances, the interviewees were unable to answer all questions regarding drivers behind the SBTi adoption. They stated that they had assumed their positions after the adoption of the SBTi, and therefore did not have first-hand knowledge about the adoption of the SBTi. However, this was not deemed problematic, because they seemed knowledgeable about it even though they had not been present. Furthermore, for areas where they lacked insight, responses from other case companies sufficed.

In other instances, logistical details, such as collaboration with transport service providers, and consideration of climate impacts in the transport procurement process, were not extensively explored in all interviews, despite their significance in the literature review. This was primarily due to time constraints during interviews and the fact that some interviewees were not directly involved in logistics but rather worked in sustainability departments. Consequently, they lacked detailed knowledge in this area. This limitation was acknowledged and taken into consideration during the analysis and discussion.

3. Theoretical Framework

In this chapter, the theoretical aspects of the thesis will be presented. Sustainable development goals, the SBTi and its effects, current regulations, theoretical drivers behind voluntary commitments, and the achievability of road transport emission reduction will be discussed to aid comparison with interview results.

3.1 Sustainable Development and the SBTi

The SBTi, founded in 2014, is a climate action organization and a multi-stakeholder initiative. The foundation is a collaboration between the Carbon Disclosure Project (CDP), the United Nations (UN) Global Compact, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF), as well as one of the We Mean Business Coalition commitments (Science Based Targets, 2021). The initiative is a global body supporting corporations and financial organizations to establish emission reduction targets in line with climate science, calling on the private sector to initiate change (Science Based Targets, 2023).

The SBTi Corporate Net-Zero Standard (2024) defines net-zero as reducing scope 1, 2, and 3 to zero or residual levels consistent with reaching 1.5°C scenarios. The definition also requires the neutralization of residual emissions at the target date, as well as any GHG emissions released thereafter. According to the SBTi Corporate Manual (Science Based Targets Initiative, 2021.), GHG emission reduction targets qualify as science-based when they are adjusted to current requirements in climate science to achieve the Paris Agreement objectives: keep global warming below 2°C, preferably under 1.5°C, compared to pre-industrial temperatures. Net Zero Climate (n.d) provides a simpler definition of net-zero emissions, stating that net-zero emissions refer to a state in which GHG emitted is equal to the relative amount taken out of the atmosphere by trees, carbon off-setting, or other similar processes.

The GHG Protocol was jointly convened in 1998 by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI) (World Resources Institute, 2015). The GHG Protocol aspires to provide standards, guidance, tools, and training for businesses and governments to measure and manage CO₂ emissions. It is used by the SBTi as the standard for emissions reporting and assessment of targets. The GHG Protocol divides emissions into 3 different scopes, illustrated in Figure 4, to help delineate direct and indirect sources of emission and improve transparency. The scope of the emission indicates its proximity to the core business operation.

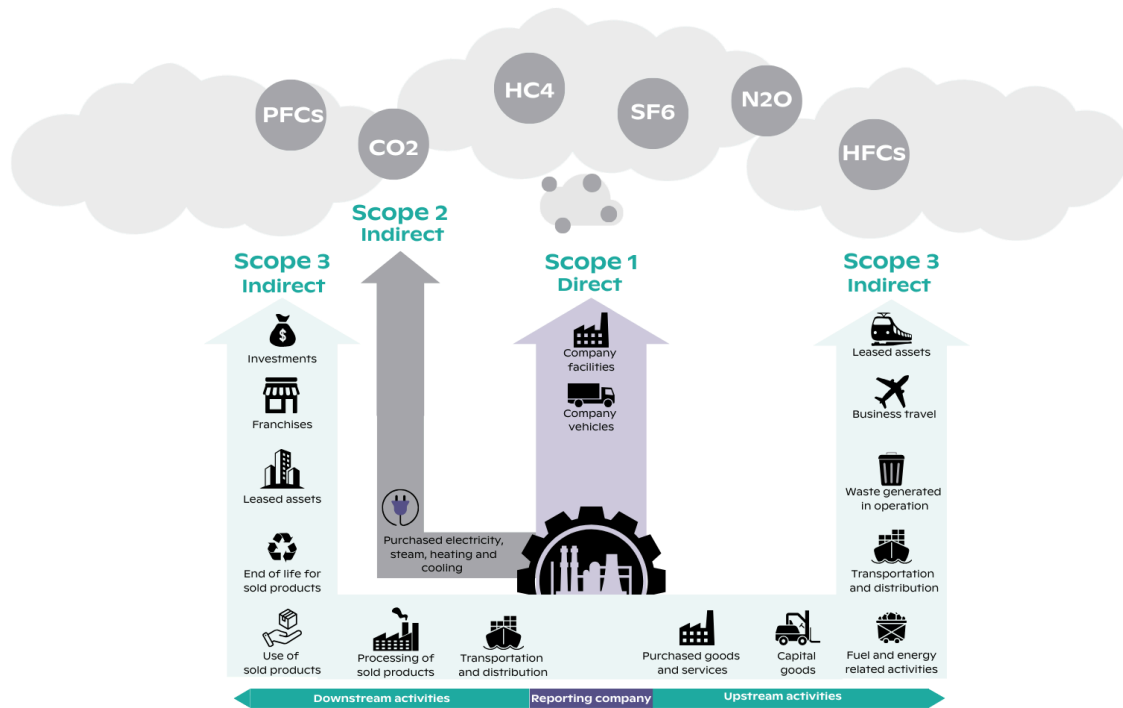


Figure 4. Overview of GHG Protocol scopes and emissions across the value chain. The figure is created specifically for this report with information from the World Business Council for Sustainable Development & World Resources Institute (2011).

Scope 1 covers direct emissions from owned or controlled sources (World Business Council for Sustainable Development and World Resources Institute, 2013). The direct GHG emissions are described as connected to sources owned or controlled by the company. As an example, emissions from combustion in owned or controlled boilers or furnaces.

Scope 2 addresses indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the reporting company. Scope 2 emissions are considered an indirect emission source since the emissions are a consequence of the activities of an external organization (World Resources Institute, 2015).

Scope 3 has the potential to report and include all other indirect emissions that occur in a company's value chain, which often represent the largest source of a company's carbon footprint. The SBTi emphasizes the importance of including significant scope 3 emissions in companies' targets, recognizing that scope 3 can often be the most challenging to address but also offers substantial opportunities for emissions reduction throughout the supply chain (Science Based Targets, 2023; World Business Council for Sustainable Development & World Resources Institute, 2011).

3.2 Assessing the Effect of the SBTi: Challenges, Relevance, and Impact on Climate Action

Science Based Targets (n.d) states its role in aiding in the target-setting process by accepting targets. It also implies that the initiative is limited in its governance over how companies choose to fulfill their targets (Science Based Targets, 2023). Tilsted et al. (2023) recognize the SBTi as offering guidance for companies aspiring to become scientifically aligned with the goals of the Paris Agreement, including the possibility of breaking greenwashing tendencies seen in previous voluntary climate schemes. Their research also states how the initiative's limited jurisdictional reach also presents challenges, even in properly conducting their most basic task which is helping companies align goals with the Paris Agreement. The article underscores the relevance of analyzing the SBTi and its approach to shaping low-carbon futures and emission pathways. The author's critique of the initiative does however suggest that current methods might disproportionately favor large corporations, potentially at the expense of democratic oversight. This calls for a deeper understanding of the politics involved in target setting, especially as targets emerge as more ambitious.

Collaborative, multi-stakeholder initiatives (MSIs) do however have support. If stakeholders only acknowledge the limit of private responses to global environmental challenges, academic and practitioner debates agree on an exciting outlook (Bowen et al., 2018; Niesten et al., 2017; Tilsted et al., 2023). Empirical research conducted by Romito et al. (2023) also suggests that corporate commitment to join a climate-focused MSI could be associated with a decreased environmental footprint, an effect that proved consistent over time. The same research also implies that only partaking in such a commitment might not be sufficient to decrease the environmental footprint.

Research focused on the context of the SBTi outcome presents findings on its effectiveness and impact. Most articles, as stated by Romito et al. (2023) report a positive outcome in an overall reduction of GHG emissions following an SBTi commitment. This indicates a potential correlation between commitment, even before target approval by the SBTi, and immediate reported carbon impact according to Romito et al. (2023). Their research further emphasizes the advantageous effects, both emission-reducing and not, of actively engaging in climate-focused MSIs. These conclusions are further emphasized by three additional articles that suggest a targeted percentage emission reduction to increase by an average of 21% to 25% in the year after an organization set an SBT (Bolton & Kacperczyk, 2021; Freiberg et al., 2021; Tuhkanen & Vulturius, 2020). The interval of average reduction depends on the percentage of emissions which is covered by the target. Allowing multiple ways to choose which emissions should be included in a target further implies differences in target-setting methods, compliance, and follow-up, indicating a need for increased transparency as mentioned in Bjørn et al. (2023). Freiberg et al. (2021) used what they call a "difference-in-differences" approach, which compared the science and non-science-based targets of a firm. The study identified a positive correlation between emission reductions and the length of the implementation period. Still, it warns of conclusions about the targeted reduction rate effects after SBTi commitments. Due to the voluntary nature of the adoption of

SBTs and challenges in testing and randomly allocating firms to specific groups for comparison, it could be premature to assert that SBTi commitments invariably result in heightened ambition (Freiberg et al., 2021).

3.2.1 Target Relevance

The other aspect of examination is the actual relevance of targets. One criticism of the claimed reductions is how emission targets and reductions are measured. According to Bjørn et al. (2023), the targets approved by the SBTi can differ substantially. When comparing two companies utilizing the same the SBTi calculation method, the authors observed variations in their targeted reductions in combined scope 1 and 2 emissions. Emissions are measured in goals of a 34% absolute reduction in emissions and a 25% reduction per ton of cementitious material respectively, while the timeframe for the goals (6 and 12 years) and resulting rates and share also differ. Bjørn et al. (2023) further explain that despite underlying reasons for specified targets, most of those reasons and the underlying data used to calculate emissions are rarely public. The lack of transparency does not only create targets and progress that are not comparable, but the study mentions how duplication to verify or rebut the SBTi's scientific claims becomes virtually impossible.

As a result of the SBTi's lack of important details, such as planned GHG emissions trajectories, it creates hurdles for open discussion and elevates the likelihood of not achieving sufficient overall emissions reduction. It also hinders the ability to hold companies accountable for their commitments and thereby uphold the corporate responsibility they want to claim (Bjørn et al., 2023). The argument made is further underlined by separate research by Romito et al. (2023), which concludes that patterns of better environmental performance are associated with stricter commitment regulation. Their research also extends previous research made by Van Tulder et al. (2016), which recognizes the importance of MSI design and its ability to enhance the initiative's effectiveness in driving committers towards active engagement rather than just pure participation. Actual initiative effectiveness has further significance in a broader geopolitical and economic scope, in properly recognizing companies' environmental efforts to avoid portraying a false sense of legitimacy for companies not in line with their targets. This approach also gains the long-term broader environmental scope by closing the gap between intention and action as well as the actual emission reduction. It maintains the importance of establishing clear measurements of progress and performance, in part achieved by efficient regulatory measurements, for the success of both private and public GHG emissions reduction initiatives like the SBTi (Romito et al., 2023).

3.2.2 The SBTi Dilemma

Research suggests that some of the apparent challenges and questionable relevance of initiatives like the SBTi, like the weak jurisdictional presence and poor post-target regulation might be more than a coincidence. According to Tilsted et al. (2023), weak jurisdiction implies more leeway for companies to manage the design of their strategy to reach their targets, successively allowing them to use methods more compatible with existing business models. Their research also recognizes how companies are free to meet SBTs even with

questionable means, even with risks of creating further social problems, as committers and target-setters who fail to reach targets ten years down the line still receive recognition for apparent sustainability achievements before the point of failure. Gieseckam et al. (2021) offer a similar insight, highlighting that most companies are on track with their targets, but nearly half need to catch up, especially in their scope 3 emissions. The study suggests that the operational reality and reporting can be inconsistent and may not fully align with actions needed for genuine sustainability outcomes, allowing companies to maintain the perception of making progress.

MSIs like the SBTi constantly face a double challenge in adhering to scientific climate outlooks and needs for emission reductions while remaining desirable to organizations. Involvement in climate action has become more than pure involvement, “sustainability has become a commodity itself, to be traded, bought, sold and managed like all others” (Ponte, 2020). An increase in sustainability engagement to keep driving capital accumulation not only pressures companies to commit to initiatives such as the SBTi, it can also lead to temporary fixes and counteract long-term action, underscoring Tilsted et al. 's conclusion. To avoid sustainability initiative failure, reinforcement from both sides, issue visibility, alignment of public and private interests, and leveraging key pressure points in global value chains are necessary (Ponte, 2020).

As previously stated, it is a fundamental dilemma that voluntary initiatives like the SBTi face, with remaining both scientifically and environmentally based while retaining and attracting further interest from companies. Tilsted et al. (2023) suggest this as a potential conflict of interest. The potential synergic effects across win-win for geopolitics, companies, governments, and social groups avoiding exploitation that should have prevailed, may be more of an allure than an opportunity. If true, this would have political consequences, with governments suffering from companies' false sense of legitimacy as a result of value judgment in managing risks surrounding targets, in the long-term allowing overshoot of peak emission year and temperature goals, undermining the overall sustainability governance (Tilsted et al., 2023).

3.3 Current Policies and Legislative Measures for Sustainability in Swedish Transportation

Sweden's current climate target was approved by parliament in June 2016 and in 2017 and adopted as the new climate policy framework. The important climate reform is a key component of Sweden's efforts to comply with the Paris Agreement. The main long-term objective within Sweden's climate policy framework mandates the achievement of net-zero GHG emissions by the year 2045. This ambition is to be achieved through specified milestone targets, which include a reduction of GHG emissions by 63% by 2030 and by 75% by 2040, relative to the baseline year of 1990 (Naturvårdsverket, n.d.).

The Swedish Climate Act has one single sectorial target, focused on emissions from domestic transport, aviation excluded. The target seeks a 70% emissions reduction by 2030 compared

to 2010. In addition to this, the Swedish Climate Policy Council, an independent body overseeing progress alignment with climate goals established by the Parliament and the Government has been established (Naturvårdsverket, n.d.). The Council's 2024 report states a 34% decrease in emissions from domestic transport since the reference year 2010, a development not corresponding to the increase in traffic. Reduced emissions can mainly be attributed to an increased share of biofuels, energy efficiency, and electrification of the overall vehicle fleet.

Despite this, a sharp increase in emissions is expected in 2024 as a result of the 2023 decision to permanently reduce the reduction obligations from 30,5% to 6% for gasoline and diesel until 2026. The legislation that requires fuel emissions to be lowered by blending in biofuels or electrofuels will be removed for 2027-2030, although there are plans to further analyze reduction requirements (Swedish Climate Policy Council, 2024).

Efforts to reduce inflation in the budget also result in various weakened climate policy obligations during 2024 according to the Swedish Climate Policy Council (2024). They claim that transport sector emissions are also covered by the EU's effort-sharing regulation (ESR), which states three changes that could make a difference:

- Create a more transport-efficient society by limiting the demand for transport, shifting to more efficient modes of transportation, and making better use of existing transport options.
- Accelerate the pace of electrification by transitioning to electric vehicles and expediting the development of charging infrastructure.
- Phase out fossil fuels through more efficient vehicles and an increased share of fossil-free fuels.

The Climate Policy Council (2024) further highlights carbon taxation as a cost-effective measure to increase transport efficiency. They state that the government's decision to lower carbon taxes on gasoline and diesel, in effect January 1, 2024, leads to a reduction in tax revenues by 5.76 billion SEK, and contradicts the formerly established government principle of enhancing transport efficiency through fiscal incentives. They also inform that such decisions do not favor transport efficiency. The Council does however recognize the government elected in 2022 as active in electrification questions. According to the Council, electrification gathered the highest total number of government decisions in 2023, some of which were pointed at trucks and heavy transport. A climate premium has been introduced to encourage the use of environmentally friendly vehicles, accelerate the electrification of heavy vehicles, and support the development of infrastructure for eco-friendly heavy vehicles and trucks. Since 2022 however, all subsidies for electric cars have been removed. The government's budget for the climate premium increases from 460 million SEK in 2023 to 2.1 billion SEK in 2024. Of this, a large part is an addition of 992 million SEK for heavy vehicles and machinery, and 450 million SEK for the expansion of light trucks. As an example of the

premium, the 2024 government reimbursement when buying a light electric truck is 50,000 SEK (Climate Policy Council, 2024).

In Sweden, a national network of public charging stations for heavy electric vehicles is being expanded. Approximately 130 charging stations are planned to be operational by 2023 and 2024, as part of an initiative by the Swedish Energy Agency designed to accelerate the electrification of heavy transport. The development spans from Luleå in the north to Malmö in the south, significantly supporting the transition towards emission-free transportation across the country. The charging network is set to be available for all truck brands and the ambition is that the initiative will facilitate haulage and transport companies electrification of transportation within and between regions (Volvo Trucks, 2023).

3.4 Drivers for Participation in Voluntary Sustainability Initiatives

The Science Based Targets Initiative (2018) claims that participation in voluntary sustainability initiatives has potential business benefits. According to a study conducted by the Science Based Targets Initiative (2018), there are several potential business benefits of setting SBTs. These claims are confirmed by their survey that included 185 executives from companies committed to the SBTi, as well as focused case studies on several of these companies. According to the SBTi, committed companies can improve their general brand reputation. Furthermore, they state that the commitment to the initiative increases awareness of climate change among investors, resulting in a corresponding increase of investor confidence. The SBTi further highlights that the governmental implementation of the Paris Agreement will result in stricter future regulations, thereby making companies already committed to the SBTi more resilient against future regulations. The SBTi makes another point that the global transition to a low-carbon economy will enable increased innovation for companies already aligned with the initiative. This transition will require prioritization of efficient operations which can potentially result in bottom-line savings.

Additionally, Aragón-Correa et al. (2020) point out that businesses already known for their environmental practices and reputation are more likely to join in on voluntary climate initiatives since they do not need to change their current approaches as radically as others might have to. According to the study, this explains why many early adopters of voluntary climate initiatives already have sustainable practices in place. Furthermore, their research highlights that company management also sees the new climate initiative as a way of further enforcing the business environmental differentiation.

Littlewood et al. (2018) explore different factors influencing corporate commitments to climate change action and their consequent impact on GHG performance. The different drivers that the article highlights are business drivers, sustainability drivers as well as stakeholder pressure. Furthermore, the authors highlight that traditional short-term motivations like increasing profits or marketing opportunities show little significance while longer-term motivations such as revenue through innovation, risk reduction from climate effects, and basic credibility in influencing new climate policies appear as positive indicators.

This suggests that industry managers perceive climate actions more as a strategic imperative but also with a focus on longer-term benefits rather than short-term profitability.

Aragòn-Correa et al. (2020) further support this claim by pointing out that short-term economic drivers are not often the reason for committing to voluntary climate initiatives. According to their research, companies committed to such initiatives can claim a higher premium for their products and services. However, this premium rarely makes up for their investment in the sustainable practice. Furthermore, it is highlighted that sustainability drivers do not significantly influence corporate commitments to climate change actions. The findings in the article challenge previous studies on the topic and suggest potential institutional and contextual influences. This is particularly the case within the European industry settings where regulatory mandates may lessen the need for explicit sustainability-driven motivations (Littlewood et al., 2018). Both Aragòn-Correa et al. (2020) and Littlewood et al. (2018) highlight the stakeholder pressure, particularly from governmental and regulatory bodies as a significant driver of corporate climate action. This underscores the role of external institutional pressures in shaping corporate behavior, with environmental groups and a local pro-environmental culture also contributing to considerable influence over corporations. The authors suggest that internal stakeholders, such as employees and management serve as one of the most important drivers. This viewpoint is supported by Hoffman (2005) who also points out that the morale of the workforce is of severe importance in retaining workers and management as well as attracting new ones. Hoffman (2005) further claims that workers as well as management are reflecting the growing awareness and expectation of corporate responsibility towards climate change.

According to Taşdemir et al. (2019), the SBTi Framework can help benefit companies as it eliminates unit-based comparisons within its standardized performance measure models. The author further highlights that some manufacturers with unique characteristics, such as electric car manufacturers with their renewable energy-dependent final products, could document their strengths more effectively through this science-based tool.

3.5 Decarbonising Road Transport

The freight industry belongs to a select group of industries that share a common challenge as they are among the heaviest emitters of GHG while also being among those industries where it is most difficult to reduce emissions (Mission Possible Partnership, 2022). Given the importance of decarbonization, it is of fundamental interest to evaluate if a move to zero-emission heavy-duty vehicles is achievable. This chapter therefore delves into different literature perspectives on challenges with conditions that need to be met before a wider adoption of these vehicles on a global scale is possible (Alp et al., 2022).

3.5.1 Technical Prerequisites

Transitioning to a zero-emission trucking fleet poses a variety of potential technical problems. Several companies have concluded extensive research and investment into low-emission trucks, and most major manufacturers have an electric model range. A

consensus exists from discussions regarding electric and zero-emission truck ranges for regional transport, in combination with proper charging infrastructure, these trucks are recognized as technically fulfilling alternatives (Engdahl, 2023; Mission Possible Partnership, 2022; Alp et al., 2022).

For long-haul, heavy-duty truck transport, hydrogen-electric trucks may become more widely adopted due to their higher energy density and faster refueling times, especially given the potential lack of infrastructure and predictable routing. According to the Mission Possible Partnership report, as much as 50% of long-haul truck sales will be hydrogen-electric, with battery-electric trucks adopted faster and in larger share along predictable routes with strategic charging infrastructure (Mission Possible Partnership, 2022). In the research conducted by Alp et al. (2022), differences in strategic decision-making and investment planning around charging infrastructure have a direct effect on the viability of zero-emission trucks. To successfully phase out fossil fuels in trucks, expansion of current access to electric charging and hydrogen must follow the same pace (Sweco et al., 2016; Mission Possible Partnership, 2022).

The cost of batteries also plays a role in charging infrastructure and truck usability. Bigger batteries but detouring for charging challenges the prejudice that bigger-is-better, as smaller batteries but denser charging networks, are both more cost and environmentally beneficial, both by sooner adoption and less environmental impact. Taking congestion effects at the charging stations, charging times as well as potential loss of productive driving time due to detours, the expected demand for charging stations can be modeled and optimized. By optimizing charging infrastructure, technical and economic efficiency can increase significantly, resulting in both a more productive working fleet as well as shorter payback time (Alp et al., 2022).

3.5.2 Cost of Technology and Zero-Emission Truck TCO Superiority

Economic incentives behind a shift to climate-beneficial trucks could accelerate sustainable vehicle adoption, which is why addressing the effect of vehicle total cost of ownership (TCO) is of utmost importance (Lévay et al., 2017). By leveraging operational efficiency advantages, cost optimization of trucking fleets could substantially speed up net-zero progress. Economic factors that impact trucking can be divided into several interconnected areas: market incentives, policy frameworks, vehicle development, and the development of timely charging infrastructure, with the latter also potentially influencing bottlenecks in other non-economic areas (Mission Possible Partnership, 2022).

Market incentives for zero-emission trucks with superior TCO create a fundamentally viable solution due to their cost competitiveness. The total cost of ownership considers a vehicle's total life cycle, taking both capital and operational costs into account. The TCO variable quantifies accumulated costs over a vehicle's lifetime, offering a better value determination (Bigelow & Hanna, 2021). As a mix of fuels and drivetrains are expected to coexist in a transitional phase, the speed of adoption for zero-emission trucks is likely to reach a tipping point. While policy and customer demand can have an impact, ICE vehicles

typically come with lower upfront or capital costs but are beginning to experience higher operational costs compared to zero-emission alternatives, depending on the market (Mission Possible Partnership, 2022; Moultak et al., 2017).

Effectivization of heavy-duty trucks is according to the 2016 Swedish project panel primarily customer-driven, implying that operational efficiency superiority increases the likelihood of adoption and that transport-buyers also have extensive influence when using their buying power. Zero-emission trucks with operational cost superiority could favor sustainable trucks by providing a cheaper transport solution for customers (Sweco et al., 2016). However, simulation research conducted by Wu and Sioshansi (2017) provides a framework for a non-deterministic vehicle TCO calculation. The author concludes that the more beneficial TCO the more a truck is used and utilized during its lifetime, the more financially beneficial the vehicle will be despite the higher upfront cost, emphasizing the need for truck operators to consider long-term ownership rather than pure capital cost (Wu and Sioshansi, 2017; Moultak et al., 2017; Mission Possible Partnership, 2022). In combination with lower operating costs, this allows higher capital utilization, resulting in lower TCO. Taking key factors into consideration, both market studies and reports showcase electric and zero-emission trucks' ability to become TCO superior between 2025 and 2034 depending on the study, compared to ICE trucks (Wu and Sioshansi, 2017; Moultak et al., 2017; Lévy et al., 2017; Mission Possible Partnership, 2022).

Lévy et al. (2017) also highlight the importance of economic incentives in market breakthroughs with large-scale adoption of zero-emission vehicles being no exception, as this is still heavily dependent on price competitiveness. Policy and incentive structures can result in a significant economic response and thereby accelerate the shift to electric trucks by advancing their TCO superiority during the transition period (Moultak et al., 2017). The Mission Possible Report (2022) also highlights policies' role and the opportunity to combine vehicle policy and market forces for complete decarbonization by 2050. Their suggestion for an accelerated zero-emission truck adoption scenario incorporates policy changes so that the cost of carbon emissions affects truck TCO for fossil fuel and other CO₂e-emitting technologies. The study's findings further showcase the role governing bodies and legislative action can have in realizing sustainability targets.

4. Results and Analysis

This chapter details the findings from the narrative analysis of interviews conducted as part of this study. The analysis reflects several driving factors and identifies the main challenges regarding the SBTi.

4.1 Drivers Behind Adoption of the SBTi

This section provides a detailed description of the findings related to drivers behind adoption of the SBTi. Two overarching key drivers were identified: strategic considerations and stakeholder demand. The primary identified drivers are presented in Figure 5.

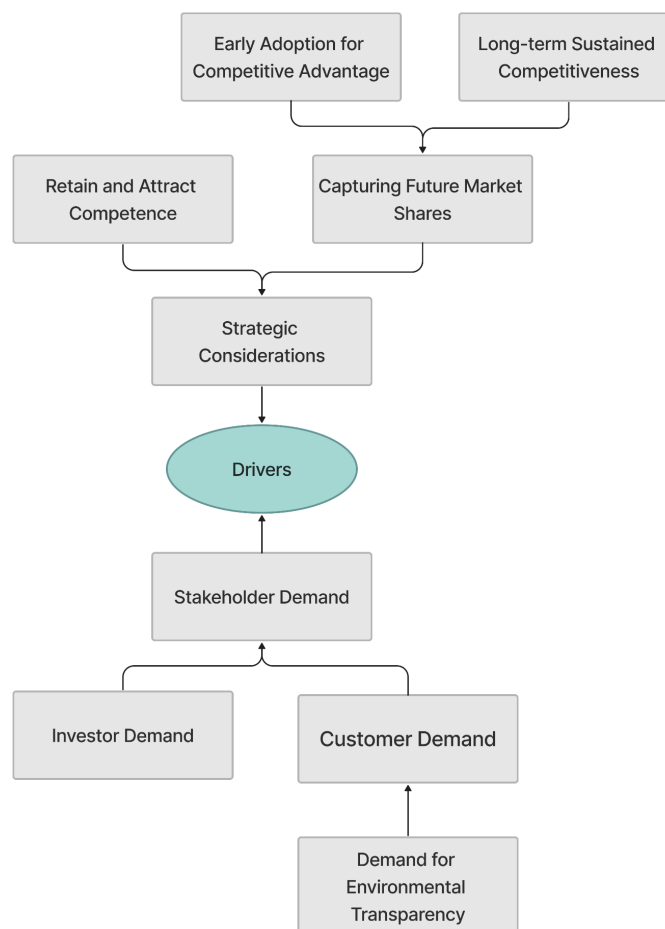


Figure 5: Illustration of primary identified drivers. The map shows the category (in oval) and its respective factors (in boxes). Solid arrows illustrate factors supporting the category.

4.1.1 Strategic Considerations

The strategic adoption of the SBTi by companies is multifaceted. It is driven by the intent to lead in sustainability, gain market leverage, and secure long-term competitive advantages. Respondents recognize the SBTi as a "ticket to play" and a prerequisite to maintaining a

market presence. The initiative mostly serves as a platform for companies already committed to sustainability to authenticate their efforts. Additionally, the SBTi process aids in identifying and rectifying operational inefficiencies, resulting in cost savings and enhanced profitability. Ultimately, committing to the SBTi is generally viewed by respondents as a strategic measure that unlocks new markets and aligns with the rising sustainability demands of larger customers, solidifying the initiative's role in shaping future business trajectories.

Although respondents highlighted a variety of motivations for the adoption of the SBTi, it is clear that they are mostly strategic in nature. Some respondents expressed a desire to be a sustainability leader within their industry, viewing the SBTi as a credible method to demonstrate this through its robust methodology and external validation. Additionally, the inclination of wanting to be market leaders was widely expressed. Both motivations allude to a desire to acquire future market shares, thus rendering them offensive strategic motivations. Some respondents, such as M1, highlight motivations that are strategic yet defensive such as the desire to retain market shares as opposed to gaining new ones. CT8 informed that they “want to build integrity in the marketplace as well as internally and what that does will build long-term trust”. Furthermore, CT8 stated the benefits of early adoption of SBTs and how they can provide competitive advantages:

If you are an early adopter, you can realize commercial benefits. You can use it to your competitive advantage. It's probably cheaper to implement. And you're not being reactive. You're being quite proactive. You're taking it at your own pace. You are setting the standard. We want to lead the industry into the future.

CT6 argued that adopting SBTs is seen as a necessity within the company for staying competitive and may become a "ticket to play" in the industry within the next 30 years, meaning that it will be essential for market participation. A majority of CT companies saw it as a natural step to commit to the SBTi, as they already worked with sustainability and could use the SBTi as a tool to confirm their commitment.

E2 further discussed the long- and short-term profitability arguments involved in the adoption of SBTs. It was highlighted that it is common for companies to find previously unidentified operational inefficiencies when conducting the mapping of emissions as part of the SBTi validation process. They further claimed that these are relatively straightforward to correct, thereby offering an opportunity to save costs. The interviewee referred to these changes as the “low-hanging fruit” and further elaborated that ambitious long-term targets typically require significant investments and potentially a revised business plan. Simply put, the adoption of SBTs brings with it an opportunity for short-term cost savings and long-term sustained competitiveness. The expert noted that adopting the SBTi also opens up new market opportunities that were previously inaccessible, particularly markets with high sustainability requirements. Some other respondents indicated similar opinions, but most stated that their current markets were raising pressure on sustainable solutions. Other respondents indicated opinions in line with this perspective, many also noted an increasing demand for sustainable solutions even within their existing markets.

4.1.2 Stakeholder Demand and Internal Motivations

The key point of this section is that internal drivers play a significant role in motivating companies to adopt the SBTi. However, external factors, such as investor demands and customer expectations, also influence these decisions. Companies recognize the importance of sustainability in attracting investors, customers, and talent as an internal driver. Additionally, customer demand varies depending on the industry and target market, with some companies experiencing significant pressure to adopt SBT, while others do not experience the pressure to the same extent.

Almost all of the interviewed companies reported strong internal drivers, indicating a high level of internal motivation within these organizations. However, internal motivation does not directly imply the inexistence of external drivers. For example, M2 claim that in order to attract the smartest and most competent people, it is required to have robust sustainability efforts that not only enhance the company's appeal but also demonstrate its commitment to sustainable practices:

We aspire to be a fantastic company and attract the smartest people out there who want to join us on this very challenging journey. At the same time, we aim to convince suppliers, customers, and other stakeholders in society to come along for the ride. And for that, we believe there still needs to be many ambitious, courageous leaders out there.

E2 similarly stated that one form of internal motivation for companies is that they want to take the climate issue seriously for the benefit of investors and customers. The majority of the companies are also convinced in their strategic planning that the climate issue will become increasingly important in the future and that tougher regulations will be introduced. Therefore, the companies want to position themselves by making this transition early. The companies believe that it is a job they need to do anyway, but by doing it earlier, they become leaders in their industry, gaining higher competitiveness in the long run. They also see that they must take the climate issue seriously to attract talent; young people are reluctant to want to work for companies that do not take sustainability seriously, which is an internal driver since companies want to be an attractive workplace.

In addition, E2 emphasized that investors are demanding companies to engage in climate action, and see this initiative as something positive. The expert explains that companies gain access to long-term investors, and there are indeed many investors who fall into that category. The major capital comes from pension funds and similar entities that are long-term oriented, and they identify interesting companies that are stable over time. Sustainability is one thing investors take into account when looking at how stable companies are over time.

CT1, CT4, CT5, CT7, and CT8 have all mentioned that investors are a big driving force in adopting the SBTi. CT4 elaborates and argues that “investors are also a very large target group, many of whom evaluate the company based on sustainability”. CT4 further explained that investors have had a dramatic increase in sustainability interest in recent years. CT8 further emphasizes that while investors play a significant role, their decisions are not solely

dictated by investor demands, as these can fluctuate. Instead, the CEO feels a personal responsibility to leave the planet in a better state than before. Consequently, CT8 suggests that despite various external factors such as investor influence, the primary driving force remains internal.

Furthermore, E2 was questioned about whether investors specifically favor the SBTi involvement or if they generally appreciate the company's commitment to sustainability. They stated that both are important, but that the SBTi is a higher stamp of quality and higher importance. The majority of companies cited customer demand as a significant driver for adopting the SBTi. CT1 noted that customers were actively seeking information about whether companies' targets were science-based, committed, or approved. Conversely, CT5 indicated that there has not been a high volume of customer requests for the SBTi adoption. The company believes that customers are more focused on broader inquiries about carbon emissions reduction rather than specifically requesting the SBTi compliance. While some customers do inquire about the SBTi, it is not considered a predominant trend.

It also appears to vary depending on the industry and whether your products are targeted towards businesses or consumers. For instance, CT3 and CT5 operate in niche markets where customers have limited alternative sources for similar products. CT7, on the other hand, cites customer demand as a significant driver for adopting the SBTi. However, the sustainability pressures faced by the company vary depending on the nature of its customer base. If the customer is an individual consumer purchasing products from retail stores, the SBTi may not hold much relevance. Yet, if other businesses are the primary purchasers and they place high importance on sustainability, the SBTi becomes a critical factor. Therefore, from a business-to-business standpoint, customers represent an additional stakeholder exerting pressure regarding sustainability practices.

4.1.3 The Political Landscape, Regulation, and Legislation

The consensus among the companies interviewed is that politics, regulation, and legislation are not the primary motivators for the adoption of the SBTi. However, they still play a strategic role in shaping companies' approaches to sustainability. The respondents are looking ahead, anticipating stricter regulations, and aligning their strategies accordingly to maintain both compliance and competitiveness. The proactive commitment to international agreements and upcoming regulatory changes, such as the EU's CO₂ performance standards, exemplifies the forward-looking nature of corporate sustainability strategies. Furthermore, potential shifts in reduction duty are considered within the broader strategic framework. Companies recognize the importance of balancing environmental objectives with economic considerations, pointing towards a nuanced approach where sustainability measures are integrated with the financial and operational realities of the business landscape.

Most respondents highlighted that politics, regulation, and legislation played a small part in their adoption of the SBTi. Instead, the consensus amongst respondents is that factors such as internal motivations, investor relations, and various strategic incentives played a bigger part.

However, it can be deduced from the interviews that they strive to be proactive toward future legislation as part of broader strategic considerations.

This is highlighted in the interview with E1 who states that the anticipation of future regulation and legislation is a significant driver for companies adopting sustainable practices. It suggests that businesses are proactively aligning their strategies to current policies and expected future regulations to maintain compliance and competitiveness. This proactive approach is evident in the commitment to the Paris Agreement and the strategic alignment with the EU's goals for a carbon-neutral Europe by 2050 and Sweden's ambitions for 2045. Additionally, the interviewee mentions specific upcoming legislative changes, such as the CO₂ performance standards for heavy-duty vehicles in Europe, which were set to be revised and finalized soon. These regulations will require a substantial reduction in CO₂ emissions from trucks by 2025 and 2030, driving companies to accelerate the shift toward zero-emission vehicles.

E1 further discussed the implications of the U.S. 2024 presidential election on European and Swedish environmental politics. The interviewee believes that if Trump wins, there will likely be a rollback of U.S. environmental ambitions. However, the respondent stated that this likely will have a small direct impact on their business strategy or the pace they need to maintain in their transition to sustainable transport solutions. They suggest that any impact would be more indirect, possibly affecting business conditions due to potential decreases in volumes and the distribution of development costs.

Furthermore, the interviewee notes that the Swedish reduction duty was decreased significantly from 26% to 6%, which led to a lower diesel price. This reduction in duty has made it financially more challenging for transportation companies to justify the higher upfront costs of electric vehicles, as the operating cost advantage of electric vehicles over diesel-powered vehicles becomes less pronounced. Additionally, the interviewee suggests that a more balanced level of reduction duty would be beneficial. They believe that a reduction duty set between 15% and 20% could strike a better balance, maintaining a fuel price that would encourage the adoption of cleaner technologies without causing severe economic disruption. This adjustment would support Sweden's climate goals and the broader EU targets by making fossil fuels relatively more expensive and thus less attractive compared to cleaner alternatives.

Moreover, the discussion revealed that economic factors are equally influential. The cost of production, particularly the price of fossil-free electricity, is a critical consideration for companies as they transition to greener alternatives. The interviewee highlights the dual challenge of aligning with sustainability goals while ensuring economic viability, especially given the significant costs associated with the advanced industrialization of new technologies. E1 elaborates that in regions like India, the push towards hydrogen technology is seen not only as a step towards decarbonization but also as a strategic move to enhance energy independence. This reflects a broader trend where environmental strategies are tailored to fit

local economic and technological landscapes, underscoring the complex interplay between global initiatives like the SBTi and localized operational tactics.

4.1.4 Benefits of the SBTi as a Concept

The SBTi is a leading choice for climate commitment among the companies interviewed. A significant majority of these companies are also actively engaged in additional climate initiatives. The SBTi is favored among the interviewees for its established industry presence and third-party validation. Other reasons include it being a continually reviewed framework that promotes transparent target setting, making it especially attractive for its comprehensive approach and credibility. The one-time affordability of the SBTi makes it accessible to a wide range of companies. Despite challenges in data collection for target modeling for scope 3 emissions and the lack of verification for progress, companies recognize that the targets have an influential role in guiding company policies.

The reason why companies choose to adopt the SBTi, as opposed to other initiatives, varies between the companies. The majority of the interviewed companies agreed that the SBTi is the most established and widely accepted initiative in the industry. Respondents such as CT1, CT2, and CT5 also noted that the SBTi is the largest third-party validator of sustainability goals and an organization with global recognition and credibility. CT5, along with other companies, stated that the reason for choosing the SBTi is that it is a scientifically based target framework that is continuously reviewed. It is, according to interviewees, the most comprehensive in terms of goal setting and approach. Furthermore, CT1 also confirmed that the SBTi creates a level playing field by setting a standard for how targets should be set, thus, generating more transparency toward stakeholders. CT3 mentioned the fact that the SBTi is an affordable one-time cost compared to many other initiatives where the fee can be much higher. This makes the initiative accessible to small-medium enterprises as well, and not just larger enterprises, which is an advantage compared to other initiatives.

Although most CT and M respondents viewed the concept of the SBTi positively, some highlighted certain drawbacks. It was commonly noted that the amount and type of data required to accurately model targets is difficult to retrieve. CT1, for instance, pointed out that the modeling of scope 3 targets requires detailed data from suppliers which is difficult to retrieve and is rarely standardized. CT4 and others also discussed that the SBTi is not a verifier of the progress toward targets, only the targets themselves. Flexibility in the way companies are allowed to do calculations and to be verified in combination with inadequate data, made the SBTi verify one way to calculate and not data. To compare the TCO of two procurement alternatives, it has to be very clear that they are similar items according to CT4. However, CT4 added that targets themselves tend to have a steering effect on the company and that the progress towards them is therefore somewhat self-regulatory.

E2 delves into the ESG (Environmental, Social, and Governance) values initiative and its comparison to the SBTi. The expert has previously studied ESG values, which serve as a method for the financial sector to assess companies. ESG encompasses various indicators aggregated into an index, evaluating different companies based on factors like investments

and sustainable funds. However, E2 explains that the challenge with ESG valuation lies in its inability to provide insight into a company's future trajectory; it typically offers a snapshot of the current scenario. In contrast, the SBTi offers a more forward-looking analysis with a distinct focus on climate issues. The SBTi considers emission reductions and goes beyond merely assessing a company's policies, emphasizing the importance of the actual implementation of sustainability transitions.

4.2 Challenges and the Role of Transportation in Achieving SBTs

This section describes the findings related to challenges and the role of transportation in achieving SBTs. Analyzing this includes examining the effect truck fleet composition has, how transport- and supply chains are expected to change as climate commitments and regulations become more stringent, and if the demand for zero-emission transport can be met in response to SBTs. Two overarching challenges were identified: The development of infrastructure and technology, market conditions, and regulatory factors influencing the TCO for electric trucks versus those powered by fossil fuels, as well as the need for coordination within the supply chain. The primary identified challenges are presented in Figure 6.

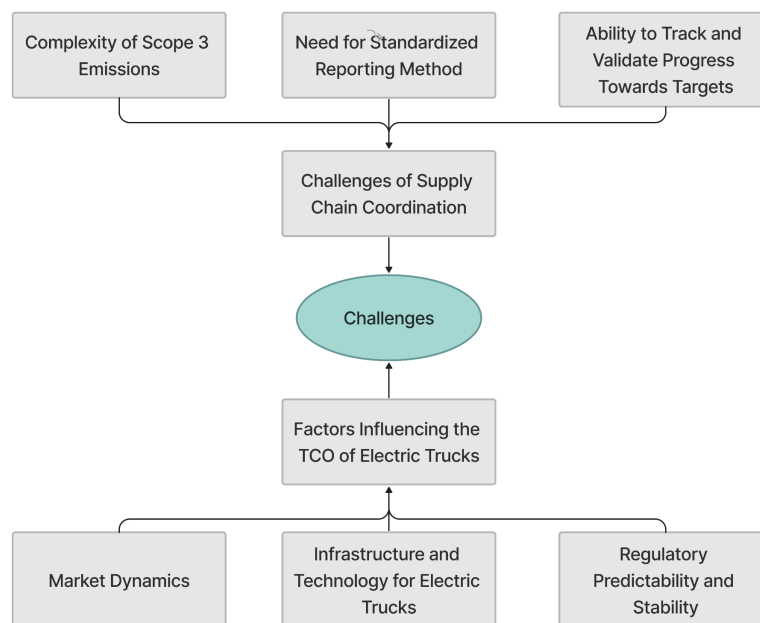


Figure 6: Illustration of primary identified challenges. The map shows the category (in oval) and its respective factors (in boxes). Solid arrows illustrate factors supporting the category.

4.2.1 The Role of Transportation

The role of transportation in achieving sustainability goals, particularly SBTs is multifaceted, with transport being influenced by a range of dependencies and strategies across different companies. Some companies with heavy transport dependencies are leading the way in the

integration of zero-emission trucks into their fleets as transport is a larger part of their broader strategy to meet their SBTs. However, with transport accounting for a larger part of emissions, companies also show a reluctance to commit to targets as ambitious as some of their peers, claiming a large part of indirect emissions is out of their control. For companies with lower transport dependencies, lack of proper validation and the ability to pick upstream transport solutions in their supply chain are reasons for sometimes not imposing stricter transport frameworks to reduce their scope 3 transport emissions. Despite varying levels of engagement in transport decarbonization, all companies recognize zero-emission trucks as important in reaching net-zero targets.

There is a large difference between companies as per transportation dependency for core business. Three of the companies, HC1, HC2, and HC3, should be considered to have transportation as their core business. One of these, HC3, has a double role, responding both as a logistics company and a company currently committed to the SBTi. HC3 scope 1 emissions include emissions related to the direct fuel emissions from their current truck fleet. All three of the logistics companies also stated that traditional trucking is heavily dependent on contracting their transport out to smaller haulage companies, acting on behalf of the logistics companies, and owning the trucks. HC3 talked further about their SBTi commitment, achievability, and their roadmap for a shift toward sustainable energy sources. They articulated a clear strategy to reduce their direct emissions, aspiring to halve their scope 1 and scope 2 emissions by 2030 and to reduce their scope 3 emissions by 30% within the same timeframe. These targets are part of a global effort, with a longer-term goal to reach net-zero emissions by 2050. Initially relying significantly on HVO and electricity, the company plans to transition mainly to electricity and hydrogen as it works towards its 2050 target. Part of their immediate actions included electrifying a large portion of their fleet, with plans to introduce 60 electric trucks in Sweden over the next two years.

Their plan to reach sustainability goals in the area of road transportation is heavily dependent on a mix of electric and hydrogen trucks, a trend that manufacturers (M1 and M2), as well as the other haulage contractors, show a consensus on for achieving climate-neutral transport. Electric trucks are a prerequisite that needs to be part of the equation to reach climate-related targets.

HC3 exemplifies this future dependency with their current Swedish fleet of roughly 80 vehicles, excluding contractors' trucks. To reach their SBTs, a swift move to electric is decisive. They plan to combine this with consistent improvement in other areas, such as solar panel installation on the roof of their warehouse as another important step in reaching their scope 2 goals. Their target commitment is also heavily dependent on matching goals and feasibility, something that HC3 also mentions as an insecurity. HC3 also highlighted that their scope 3 emissions have a dependency on truck manufacturers' ability to cut emissions, creating a reluctance towards overly ambitious targets and fueling the notion of the transport sector being hard to decarbonize.

HC1 stated having no public sustainability commitment. Despite this, they claim an internal goal of being zero-emission as a company by the end of 2025, mainly also through increasing their now 10% share of electric trucks in combination with HVO and hydrogen trucks. HC1 also explains that choosing truck fuel and truck technology in the right way also has a lot of other implications. Learning to work differently and be proactive is in large part a driving force and in their terms an enabler to assimilate new technology. Part of that strategy is to keep buying the latest truck technology, even if it is at a premium, both to be attractive to customers and to respond to regulatory change.

This view is shared by both manufacturers and haulage contractors as well, which in transport solution procurement would like to lead by example and implement electric trucks to benefit from learnings later down the line. M2, however, like all other suppliers, raises concern over a purely electric fleet, considering that infrastructure and access to green electricity globally are insufficient to facilitate zero-emission trucks. Additionally, M2 suggests that without proper infrastructure, electric trucks are as green as diesel trucks, something that poses other challenges compared with those of the Swedish market. M1 further emphasized the importance of leading by example to demonstrate the feasibility of transformative changes. They noted that many customers have not yet realized the inevitability of this transformation and the benefits of engaging with it gradually through learning and adoption. The process is complex and involves planning around multiple new parameters, yet it cultivates a significant level of expertise within the company. While some believe that transitioning to electric trucks will be straightforward once they become mainstream, those who delay miss out on the opportunity to develop crucial planning skills. In contrast, more progressive companies that have begun their transition are seen as more dynamic in their thinking compared to those who have not started.

Opinions vary when evaluating the importance of shifting to sustainable transport for companies that rely on transportation to meet their targets. One-third of companies purchasing transport services consider transportation a big part of their emissions, while 70% of the dependent companies' transport-related emission targets are in scope 3. Overall goals and perceived importance of transport in the overall target also varied greatly between transportation customers.

Interviewees indicate that companies with lower interest in reducing road transport emissions may still rely heavily on transportation but have shifted their focus towards other transport alternatives, such as rail or sea. Another factor contributing to this low interest is the predominance of flight emissions of some interviewee's total transport emissions. For instance, CT5 stated that flight emissions account for 90% of their total transport emissions. CT5 also expressed a reluctance to offset emissions through certificates, opting instead to explore alternative fuels despite challenges.

Another scenario, exemplified by CT2, describes how production is responsible for a large part of total emissions: "Our production corresponds to 80% of total emissions, ..., green truck transport is not a focus right now." CT4 asserted that transport is less than 10% of total

emissions, and that sufficient means to measure emissions from transport does not exist as one reason for not including its current targets despite its importance. They explained the decentralized nature of their logistics procurement, which often occurs at the local or business unit level, and sometimes encompasses multiple sites. They noted the absence of a central purchasing system capable of measuring all relevant data as a significant challenge, stating that the decentralized approach complicates the initiation of implementing standardized measures across the company. CT4 outlined a hypothetical scenario where initiating such measures would involve issuing guidelines on strategic planning and requiring reports on all improvements. They also mentioned the challenge of setting priorities in transport goals, where sometimes the more sustainable option might be chosen even if it's more costly. CT4 was partly critical to having requirements and recalled an instance with a company that purported emission savings greater than their total emissions in a report. CT4 highlighted the unreliability associated with implementing new guidelines, reports were received from suppliers claiming substantial CO₂ savings which later proved to be inaccurately reported, highlighting the challenges of relying on third-party data.

CT1 includes upstream and downstream transportation, where 10% of their scope 3 emissions are upstream transportation. Downstream, which CT1 states are in their control, is around 1% of scope 3. Given scope 3's share of total emissions, transportation is of high importance for CT1. Furthermore, CT1 believes that transport emissions savings per kilogram partly come down to planning. Better planning and fewer goods transported by air result in a higher degree of filling. M1 implies that achieving success with more sustainable transports does not have to be a trade-off, higher degree of filling implies lower price and less emissions. Similar conclusions on the target effect on transport could be seen from CT1, CT7, and CT8 amongst others.

CT8 shares a similar view on the importance of transportation in target setting, stating that 92% of their emissions were in purchased goods and services included in scope 3. According to CT8, shifting a large portion of their transport volume to boats reduces reliance on road transport. Additionally, opting for low-carbon alternatives can further decrease emissions, provided these options align with customer service requirements. Prioritizing low-carbon transport is not always feasible, CT8 noted. Companies purchasing transport services are somewhat at the logistics providers' mercy. If these companies can more effectively meet their SBTs through areas within their control, that is where they will focus their efforts.

As to how the SBTi has affected the requirements put on logistic service providers, there is an obvious connection to whether it is included in their targets or not. For M2, transport-related emissions were part of their scope 2 targets, causing them to put hard requirements on transport. Whether the company only used electrical transport, M2 stated that they try to use it as far as possible. However, their transport purchasing, despite being a truck manufacturer, is still made an open market, and having prerequisites about only using electric trucks would become economically unsustainable. M1 explained a similar situation, and a dependency towards upstream suppliers' choice of transport as well as procurement power in supplier

choice. This makes structural change difficult, but gradually stricter requirements are implemented and slowly driving change.

CT7 notes how they have changed how they work with transport suppliers to evaluate alternatives, in addition to maximizing fill rate, replacing fuels, and optimizing routes and transport methods. CT8 recognized how their prioritization and effective way of using their buying power affects choice, but because of the need for large transport volumes, having too strict requirements is not a viable alternative. Many other companies shared similar views as well, CT1 continuously evaluated and replaced internal transport fleets and picked transport solutions according to best practices but did not have any solid requirements. CT6 had no requirements at all, and CT3 had supplier requirements but did not recognize them as having any connection to their SBTs. CT5 reported that they had no specific requirements, as no transport companies could meet their standards. CT2 has changed agreements for truck fuels and thinks that their supply chain would have looked different if they had not adopted the SBTi. The SBTi goals in combination with other climate initiatives are behind these choices. The company also states that in the future it will become tougher and tougher as it becomes more important. Fossil-free is an investment cost and the business model must accommodate this. In combination, there must be a consumer that is willing to pay and that is the difficulty in finding balance, according to CT2. HC2 and CT6 agreed with E1 and E2, sharing the same view on effectivization, and believed that many of the actions put in place would have been done regardless, because of the desire to optimize cost and performance.

4.2.2 Legislative and Regulatory Prerequisites

Various stakeholders' perspectives reveal common ground and differences regarding sustainability in business practices. While some companies highlight the necessity of stable policies and incentives for long-term planning and investments, others instead advocate for standardized reporting to empower consumer decisions and ensure accountability. The general concern about regulatory burdens and administrative impacts further underlines the need for more nuanced policymaking. Moving forward, a more collaborative approach that considers these diverse viewpoints will be essential in adopting sustainable practices within the business sector.

When examining the responses of interviewees regarding this matter, it becomes evident that there are areas of consensus as well as divergence in their perspectives. Company M1, CT2, CT4, and CT5 emphasized the importance of long-term policy stability as well as greater insight and clarity. They argued that businesses will require assurance that policies will remain consistent over time to confidently undertake long-term strategic planning and investments in sustainability. For example, CT2 highlighted the adverse effects of sudden policy changes, using the discontinuation of tax benefits for biofuels as an illustration. M1 also expressed the need for other incentives, for example making non-renewable fuels more expensive or for legislation regarding predictable incentives for adopting electric vehicles. Similarly, CT5 called for a greater long-term commitment for the governments to provide support for the industries' transition towards better sustainability. Furthermore, HC3 expressed concerns about the unpredictability of regulations affecting investments in

sustainability. They emphasized the need for assurance that policymakers will support these initiatives in the long term, which is crucial for making the necessary investments to facilitate a sustainable transition.

CT1, CT6, and CT8 are all strong advocates for standardization of the way companies report their sustainability data. They argue that standardization methodologies are crucial for ensuring that customers can compare and make informed decisions regarding purchase decisions. CT1 underscores the need for standardized reporting formats in the context of initiatives like eco-design directives and a digital product passport. M2, CT6, and CT8 highlight the importance of standardizing methods for calculating CO₂ footprints which would allow for even more accurate comparisons between products and to be able to transparently facilitate consumer choice. E2 adds that one challenge regarding how companies report their sustainability data is that there is no common database in which the annual emissions per scope of the SBTi companies are reported, making it resource-intensive for an external auditor to evaluate the companies' goal achievement.

CT1, CT6, and CT8 further discuss the need for transparency and disclosure in the companies' sustainability reporting, where they assert that regulations should mandate transparent reporting practices to be able to hold companies accountable for their environmental impact. CT8 further acknowledges the comprehensive nature of already existing EU regulations such as the Corporate Sustainability Reporting Directive which mandates audited sustainability reports. CT8 together with M2 therefore also express concerns about the administrative burden and its potential impact on operations. They therefore underscore the need for balanced policymaking that addresses environmental objectives while making sure to minimize the negative effects of business operations.

E2 highlighted the numerous advantages of voluntary initiatives, but pointed out a drawback: since the SBTi is optional, participants can withdraw if circumstances become challenging. Many voluntary initiatives have encountered this precise issue, as their effectiveness in reaching objectives has often fallen short. The lack of a global transition framework can threaten companies' commitments, both in Sweden and internationally. Since the entire value chain is involved, companies are interested in having a clear and strong transition pressure everywhere. Their whole sustainability analysis is based on the fact that this transition must be made anyway and that they will be winners in the future when they have implemented it and when there is a demand for the climate-smart products they produce. However, the current policy has reduced transition pressure, potentially weakening demand for their products by altering relative prices. This presents a challenge. They seek stable, long-term regulations that remain consistent and anticipate that policies will be enacted to steer progress toward the goals, not deviate from them.

4.2.3 Achievability of SBTs

There is a unanimous sentiment among the CT respondents of being on track to meet their SBTs, particularly for scope 1 and 2 targets, which are more controllable. Scope 3 targets require extensive supply chain collaboration and are therefore more complex challenges.

Although plans are in place for long-term and net-zero targets, there is a general hesitancy to delve into the specifics and feasibility of these plans, reflecting an industry-wide recognition of the substantial collective effort required. Early efforts are typically more straightforward, involving the identification and correction of inefficiencies. However, as companies move past these initial steps, the complexity and cost of further emissions reductions increase significantly. The path to achieving ambitious targets will demand not only financial investment but also fundamental changes to business models.

All CT respondents are positive regarding their ability to achieve their SBTs. HC2, CT7, CT8, and others stated that they are on track to reach their SBTs. For example, CT7 noted that they are ahead of their scope 1 and 2 targets. Furthermore, it is a common theme amongst respondents to be more confident in their ability to reach targets set in scopes 1 and 2, and less confident in their ability to reach scope 3 targets. The reasons for this are exemplified by CT1 who discusses the fact that scope 1 and 2 targets are more controllable by the organization itself. Conversely, targets in scope 3 involve coordination with the supply chain, including suppliers and distributors. Scope 3 is therefore, according to CT1, much harder to both measure and achieve. This perspective is broadly agreed upon among the respondents and was further emphasized by CT9 who explained the challenges of fully understanding and implementing Scope 3 emissions, acknowledging the complexities but also the critical need for collaboration across the supply chain to achieve these goals. They also highlighted the difficulty in obtaining accurate data and the need for more robust methodologies to measure and manage these indirect emissions effectively. CT7 highlighted the complexities of estimating their scope 3 emissions, which are based on their customers' scope 1 and 2, noting, “This dynamic deserves big respect as it's not something that can be done easily; it involves a significant amount of work”.

Additionally, the responses to the question of achievability primarily focused on short-term targets rather than long-term and net-zero commitments. When explicitly questioned on the issue of net-zero targets, it was frequently explained that net-zero commitments require a comprehensive alignment across the entire supply chain. Most respondents stated that they have a plan for their net-zero targets. However, it was rarely explained what the plan looks like and whether the plan is feasible. Interviewee M2 highlighted the need for all suppliers to actively pursue these goals. According to M2, achieving the 2040 net-zero target is largely dependent on every partner in the supply chain working in unison toward this goal. The challenge extends from material suppliers modifying their production methods and developing new technologies to ensuring that the infrastructure, such as ships, uses fossil-free steel. M1 further highlighted that the effort must be collective and encompass everything from the vehicles used by the company to every actor in the value chain contributing to the transition. M2 noted that while awareness and active participation are higher among larger companies, the level of commitment can vary significantly across different parts of the world.

E2 elaborated on the observation that initial strides toward meeting targets are relatively straightforward and less costly, in contrast to the more complex and financially demanding changes that will be required in the future. E2 also explained that an early benefit observed

during the emissions inventory phase is the identification of inefficiencies, which allows companies to cut costs. However, the subsequent steps involve more costly measures, where businesses initially pick the "low-hanging fruit." Eventually, achieving further emission reductions might require significant investments and potentially drastic alterations to business models. E2 cited examples of large Swedish companies that recognize the unsustainability of their current models and are aware of the need for radical changes in the future.

5. Discussion

This chapter seeks to analyze the empirical data collected from the respondents concerning the adoption and implementation of the SBTi. It compares these findings against the theoretical constructs discussed earlier. The goal is to explore the nuances of drivers behind the SBTi commitments and the specific challenges faced in achieving these targets within the transport sector.

5.1 Assessing Drivers behind Commitment to the SBTi

It became evident when examining the results that there are several types of motivations companies face when committing to the SBTi. Many interviewees expressed the desire to see themselves as leaders of sustainability within their field of work, with the aspiration of capturing future market shares. This could be captured by CT1, who expressed in a representative way that they “have always strived to have that leadership position in sustainability in the industry” and CT8 further representatively asserted that “it becomes a question of the future and new potential market shares”. Another important aspect of motivation for the SBTi commitment was the desire for early adoption of the targets to potentially gain a competitive advantage, as CT8 stated in the results. Companies recognize the importance of early adoption of sustainable practices to position themselves as leaders in the industry. The effect is generally overstated according to Aragón-Correa et al. (2020) who argue that progress is more linked to preexisting environmental records rather than their participation in voluntary sustainability initiatives, such as the SBTi. E2 further identified that the adoption of the SBTi brings with it an opportunity for short-term cost savings and long-term sustained competitiveness. Littlewood et al. (2018) and Aragón-Correa et al. (2020) also emphasize the importance of long-term benefits such as innovation-driven revenue streams as well as strategic investments in long-term competitiveness. While most CT respondents recognized the long-term competitive advantages of the SBTi, they did not report any immediate short-term financial gains, in line with the research by Littlewood et al. (2018) and Aragón-Correa et al. (2020). Investments in sustainable business practices often do not yield immediate short-term cost savings, which appears illogical at first. However, if short-term gains were a common outcome, every company would likely pursue these investments. Instead, as illustrated by the Mission Possible Partnership (2022) with zero-emission trucks, long-term strategic advantages and operational cost reductions that companies seek is more aimed at prioritizing future-proofing their operations over immediate financial returns.

CT6 conveyed how commitment to the SBTi may become a “ticket to play” and a necessity to stay competitive. This was further highlighted by E1 who stated that companies actively align their strategies in anticipation of future regulations, to stay competitive and maintain compliance. A majority of the customers of transportation saw it as a natural step to commit to the SBTi and use it as a tool to show their commitment to sustainable practices. The proactive nature of this driver is primarily viewed as strategic, yet the claim that the SBTi may serve as a future “ticket to play” also implies pressure from stakeholders. Since this

pressure is anticipated to occur in the future, the decision is focused on the long term, aiming to secure future advantages. As a result, the driver is more aligned with the realm of strategy.

Taşdemir et al. (2019) state that the SBTi as a tool provides a competitive edge for companies, as strengths can be more effectively documented. This aligns with the companies' viewpoint that committing to the SBTi is a great way of showcasing their sustainability work. The common theme among the interviewees was that to achieve the above-mentioned, they need to commit to initiatives like the SBTi to retain and attract new competence, as well as enhance the company's appeal. Another driver behind companies committing are investors, who according to the interviewees play a crucial role in climate action. They view engagement in climate action positively and demand fundamental sustainability efforts from companies. Investors are therefore seen as a significant driving force behind the adoption of the SBTi.

All drivers mentioned above align with what the Science Based Targets Initiative (2018) addresses as business benefits. Customer demand was found as a significant driver amongst the majority of the interviewees and CT2 among others clearly stated that customers demand clear sustainability efforts. It was found from the interviews that it plays a substantial role in shaping company policies and commitments toward sustainability. The majority of the interviewees emphasized that customer expectations go more and more toward sustainable practices and products. Customers are not only more aware but are also demanding that companies demonstrate real, impactful environmental stewardship. This shift in consumer point-of-view is pushing companies to adopt the SBTi commitments not just as a regulatory or market-driven necessity but as a response to growing market demands for transparency and responsibility in environmental matters. This emphasis on transparency was evident from the interviews, where three CTs advocated for regulations that mandate transparent reporting practices to hold companies accountable for their environmental impact.

Research conducted by Bjørn et al. (2023) and Romito et al. (2023) did however provide a new perspective on commitments by highlighting transparency issues surrounding the SBTi. Despite positive statements made by many interviewees, their research specifically highlights the possibility that some companies will use the SBTi's transparency issue to their advantage, something that would be hard to identify based only on interviews with companies. However, it should be mentioned that some respondents, like CT4, raised similar transparency concerns highlighting another reason for possible commitment. The study conducted by Tilsted et al. (2023) further points out the apparent risk with the transparency issue by stating that committed companies will receive the short-term advantages associated with such a commitment despite failure to achieve targets ten years down the line. Giesekam et al. (2021) pointed out how nearly half of the committed companies, even though this was 2021, needed to speed up their scope 3 emission reduction to stay in line with their targets. None of the companies were keen to express concerns over their ability to achieve their targets, highlighting another aspect and driver behind commitment. If target achievement can be pushed further and further into the future, while keeping the present advantages, drawn to an extreme, another reason for commitment might be a lack of direct current downsides.

Furthermore, a majority of customers of transportation highlighted the significant role investors play as a driving force in adopting the SBTi, noting a dramatic increase in investor interest in sustainability in recent years. These observations suggest that both market forces and regulatory measures are crucial in promoting transparency and responsibility, increasing the accountability of businesses to both their consumers and investors. Romito et al. (2023), however, argue that better environmental performance is linked to stricter regulatory oversight rather than solely market pressures. This research suggests that while investor influence is significant, regulatory structures play an essential role in ensuring effective and genuine sustainability efforts. This means that the theoretical insight suggests a more complex interplay between regulatory measures and market forces than what the customers of transportation perceive. This divergence points to a possible overemphasis on the role of market forces as seen by customers of transportation, and an underestimation of the role of regulatory frameworks.

It is evident from the analysis of interviews and literature that the drivers for the SBTi commitment can ultimately be grouped into two primary categories: strategic considerations and stakeholder pressures. From a strategic standpoint, companies see these commitments as a means of enhancing their sustainability leadership, capturing future market share, and gaining a competitive edge. Early adoption is viewed as a proactive move to secure long-term growth by showcasing leadership in sustainability and aligning with evolving regulatory requirements. This strategy allows businesses to future-proof their operations, create efficiencies, and strengthen their resilience against shifting market dynamics. On the other hand, stakeholder pressures arise from growing demands by customers, investors, and regulatory bodies. Customers increasingly expect transparency and meaningful environmental practices, pushing companies to adopt the SBTi as a way to visibly demonstrate their commitment to sustainability. Investors are also interested in businesses that prioritize climate action, using their influence to favor companies aligning with long-term climate strategies. Regulatory requirements further add pressure by holding businesses accountable for their environmental impact and compelling them to adhere to evolving standards. These groupings reflect the dual nature of the SBTi commitments. Companies embrace them not only as strategic decisions aimed at future gains but also as necessary responses to evolving market expectations and regulatory landscapes, illustrating the complex interplay between internal strategies and external pressures.

5.2 Challenges of Achieving SBTs in the Transport Sector

Both the theoretical framework and interviewees highlight that companies find it more feasible to meet scope 1 and 2 targets compared to scope 3. The GHG Protocol (2004) outlines these scopes clearly and discusses their relevance in tracking direct and indirect emissions. This aligns with how companies reported their experiences and confidence in managing these scopes in the empirical data. Furthermore, the theory and empirical data both acknowledge the complexity of scope 3 emissions, which involve the entire supply chain. This is consistent with the Science Based Targets (2023) theoretical description of scope 3

emissions as encompassing all other indirect emissions that occur in a company's value chain and the empirical findings that point to the difficulty in achieving these due to their dependency on external entities.

Many interviewees emphasized the importance of standardized reporting methodologies. They argued that such standardization is essential for enabling customers to make informed decisions. This need for standardized reporting formats resonates with Sweden's legislative measures, which seek to create transparency and comparability across industries. This has historically been done through initiatives like eco-design directives and digital product passports.

This is further highlighted by Bjørn et al. (2023) who claim that the targets approved by the SBTi differ significantly. The discrepancy in targets between companies, even when using the same the SBTi methodology, indicates a broader issue of consistency that Swedish climate policy could address through more detailed regulatory guidelines. By enforcing standardized calculation methods and requiring detailed public disclosure of the data and methodologies used for setting targets, policymakers can enhance the credibility and comparability of SBTi commitments. This approach would not only aid in achieving Sweden's national climate goals but also provide a more reliable framework for companies and their stakeholders to assess and compare sustainability performance accurately. Furthermore, Bjørn et al. (2023) point out that the targets themselves sometimes lack important details, suggesting that even the target-setting process is based on calculations of different standards. This creates a lack of transparency and an unfair admission procedure. According to the author, this can undermine the integrity of the SBTi and the corporate sustainability efforts it seeks to promote. This aligns with the Swedish government's efforts to promote eco-design directives and digital product passports, which are intended to increase transparency and facilitate informed decisions by consumers and investors.

The interviews also emphasized the importance of regulatory predictability and stability. The strategic nature of SBTi commitments means that companies must often make substantial operational adjustments and investments in new technologies, which can be challenging if regulatory landscapes are subject to frequent changes or are unpredictable. This sentiment was shared by CT2, who highlighted the need for clarity in sustainability metrics: "We wish to see clear and standardized ways of measuring CO₂. Much is unclear and changes quickly in sustainability, which makes us hesitant to commit until we know what the playing field looks like." Following this perspective, it becomes evident that businesses need assurance that the rules, incentives, and standards they rely on to shape their strategies will remain consistent over time. This is reflected in Sweden's long-term climate policies, which are designed to achieve net-zero GHG emissions by 2045. It also has specific milestones such as a 63% reduction by 2030 and 75% by 2040 relative to 1990 levels. This provides a clear framework within which companies can plan and execute their sustainability strategies. These well-defined goals not only facilitate a smoother transition to low-carbon operations but also support the development of long-term business strategies that are aligned with these national objectives. The presence of such milestones offers businesses a predictable trajectory for

policy evolution, thereby reducing regulatory risk and enhancing the feasibility of meeting SBTi commitments.

For companies more heavily dependent on transportation in their core business models, which include both haulage contractors and transportation buyers, sustainable practices are crucial. It is however clear from the interviews that decarbonizing truck transport is both technically, economically, and operationally challenging. Haulage contractors with electric truck experience in particular describe technology as a challenge. Moultaq et al. (2017) also outlined challenges for zero-emission heavy-duty vehicles, including charging infrastructure, economies of scale, and long-distance travel. This aligns with the consensus of findings from interviews where challenges were discussed and in particular with M1 and HC3, who describe the technological hurdles and operational learning curves associated with transitioning to electric trucks. A proactive approach to training for new technologies in a transition period could improve operational abilities and reduce costs in the long term. These challenges are also reflected in the strategic decisions discussed by Alp et al. (2022), who emphasize investment as a key factor in making zero-emission trucks viable.

Other technological challenges were also discussed by respondents, with battery technology, charging infrastructure, and supply chain proximity extracted as potential key enablers for less transport emissions and the breakthrough of zero-emission trucks. These aspects of technological barriers are partly shared with research by Moultaq et al. (2017), Mission Possible Partnership (2022) and supported by Lévy et al. (2017), focusing on the superior TCO of zero-emission trucks over the long term. This perspective is crucial when considering your interview findings where logistics companies indicate alignment with research on TCO superiority for zero-emission trucks. However, many transportation customers do not prioritize this due to immediate cost concerns.

Some of the transport customers did however express different views highlighting that moving towards sustainable transport alternatives partly was at the mercy of logistics companies and the availability of solutions gaining their SBTs while upholding customer service standards. In essence, this view comes back to what others expressed as the economic unsustainability of imposing strict internal regulations on sustainable truck transports, in particular when the returns per kg emissions reduction is better in other reduction areas. Both transport customers and logistics companies face the costs associated with transitioning. The interviewed haulage contractors projected zero-emission truck adoption rate seemed to be aligned with that suggested in the research presented by Moultaq et al. (2017) amongst others. Many transportation customers did not share this mindset, in particular, those who stated that road transport emissions were not prioritized. For several reasons mentioned, they had chosen not to focus on road transport in achieving their SBTs and most stated no time plan for when incorporating transport in their SBT achievement could be relevant. All respondents welcomed the opportunity but seemed unaware of projections like those suggested by the Mission Possible Partnership (2022) in truck operational costs. Nevertheless, some seem to neglect this in their prioritization in other areas instead. Given the considerations implied by most major researchers, amongst others Sweco et al. (2016)

and Wu and Sioshansi (2017), the view that there is an existing solution waiting to become economically and organizationally superior for long-haul heavy-duty transport should be considered untrue and approached with care, as there is consensus from both researchers and interviewees that this is not the case, which in part could explain some of the CT companies reluctance. Haulage contractors are however more affected by this change and might therefore also need to be more proactive.

Another critical aspect highlighted was the ability to track and validate sustainability targets and progress. Responses varied among interviewees, but many emphasized the need to integrate sustainability reporting into their core business processes. This integration often requires significant shifts in workflow. While many stated that stringent regulatory requirements are beneficial in theory, they can impose substantial administrative burdens. These concerns are particularly interesting in comparison to research conducted by Tilsted et al. (2023), which expresses the need for further regulation. Stricter requirements on compliance can include less administration, however. Several of the interviewees voiced concerns over the SBTi's non-existing follow-up on targets, which aligns with the information provided by the SBTi about their role (Science Based Targets, 2023). It is apparent that proper monitoring and reporting is a double problem for both committers and the SBTi, also implied by Romito et al. (2023). Respondents expressed difficulty in the measurement and validation of transport emissions, especially in scope 3, impacting the ability to set realistic and achievable targets. However, problems related to managing the reporting from such large supply chains in some cases make ambitious targets challenging to pose. With various companies excluding the transportation part in their targets due to tracking difficulties, it misses the point of achieving emissions reductions and tracking emissions at the cost of transparency. It could be argued that these areas should have been the priority outcome of initiatives like the SBTi, as partly expressed in the findings of Bjørn et al. (2023) and Van Tulder et al. (2016). Proper coordination and communication within the supply chain are critical when working towards targets that affect other stakeholders in scope 3. This might represent a significant challenge not only for transport-reliant companies but also for those committed to the SBTi and engaged in broader sustainability efforts.

In conclusion, it is evident from the analysis of interviews and literature that the challenges of achieving SBTs in the transport sector can be largely grouped into two overarching categories. First, the development of infrastructure and technology, market conditions, and regulatory factors collectively influence the TCO for electric trucks compared to those powered by fossil fuels. Research and interviews consistently point to critical challenges, such as the need for advanced battery technology, more extensive charging infrastructure, and market conditions that can support economies of scale. Regulatory predictability also emerges as a crucial factor, as companies need stable guidelines to confidently invest in new, low-emission technologies. Additionally, while there exists potential for TCO superiority of electric trucks, some customers tend to focus on immediate cost concerns for road transport, which shapes their transportation priorities and complicates efforts to transition to electric fleets. The second category revolves around the need for enhanced coordination within the supply chain. Clearer reporting methodologies, consistent regulatory frameworks, and

improved tracking of scope 3 emissions are crucial for setting realistic targets and effectively monitoring progress. However, the inherent complexity of supply chain operations makes it challenging to achieve cohesive sustainability goals across the board. Close collaboration between transport customers, logistics companies, and sustainability initiatives like the SBTi is necessary to foster transparency and alignment in the pursuit of emissions reductions. Ultimately, addressing these interconnected challenges requires synchronized advancements in infrastructure, technology, and regulation, alongside a concerted effort to better coordinate the entire supply chain for meaningful progress.

5.3 Relevance and Suggestions for Further Research

This thesis has identified some of the challenges faced by companies committed to the SBTi. One area highlighted by an expert is the fact that some companies commit to the SBTi but never validate their targets or make progress in the process. In some cases, companies even drop out of the initiative altogether. Exploring this case further could provide valuable insights into the challenges associated with the adoption of SBTs. While this study focuses on companies that have already adopted SBTs, examining the perspective of companies that have chosen not to validate their targets would offer a broader understanding. This would help to balance the perspectives and provide insights beyond those of companies that have already adopted SBTs. In addition, it could help answer the question of what threatens the commitment of companies and what could lead them to drop out of the initiative.

Another interesting area raised by the interviewees for further research would be the relevance of the SBTi in a broader setting, for example, if a transport company is not committed to the SBTi but still works with sustainability. A compelling topic for further investigation would be to explore whether adopting SBTs leads to a more significant reduction in a company's emissions compared to engaging in sustainability efforts in other ways. Some companies have mentioned that since they already worked with sustainability, they did not have to make any drastic changes in their work when adopting the SBTi.

Lastly, one interesting topic to study in the future is how companies committed to the SBTi would implement sustainable transport solutions, and if a commitment to the SBTi would affect this. This research would help us understand how companies put into practice sustainable transportation in accordance with the SBTi. Additionally, it would be interesting to look into how their commitment to the SBTi influences how they approach sustainable transportation.

6. Conclusions

This study aimed to understand the factors driving the SBTi adoption among Swedish companies reliant on road transportation and the challenges associated with road transport emission reduction. The method involved a literature and interview study with semi-structured interviews with stakeholders in the transportation industry. These included manufacturers, customers of transportation, haulage contractors, and industry experts. For this, two research questions were formulated, covering both the drivers of the SBTi adoption and the challenges in achieving SBTs related to the decarbonization of road transportation. The first was found to be crucial for understanding the second.

RQ 1 What drives Swedish companies reliant on road transportation operations to adopt the SBTi?

RQ 2 What are the biggest challenges related to road transportation emissions reduction in achieving SBTs?

The answer to RQ1 is strategic considerations and stakeholder pressures. Strategic considerations include the desire to be recognized as both responsible and a market leader in sustainability. It also includes gaining market shares, securing long-term competitive advantages, and unlocking new markets of larger customers with higher sustainability demands. The study also finds that proactiveness toward future regulation is a common strategic driver of the SBTi adoption. Stakeholder pressures include factors such as investor demands and customer expectations. More specifically the SBTi is seen as a hygiene factor and as a value add by investors and customers. The study also finds that the SBTi can attract new investors, customers, and talent. Commitment to the SBTi was in part identified to be driven by consensus on the company's view of them as the largest third-party, most credible, and recognized body for climate target validation.

The answer to RQ2 includes the development of infrastructure and technology, market conditions, and regulatory factors influencing the TCO for electric trucks versus those powered by fossil fuels, as well as the need for coordination within the supply chain. Infrastructure and technology challenges include battery, drivetrain, and truck technology which is tightly coherent with TCO. In addition, expansion of fuel-specific infrastructure is needed to meet rising demand. Furthermore, challenges regarding market conditions and regulatory factors influencing TCO include changes in policy framework such as the Swedish reduction duty. Additionally, unpredictable changes to these frameworks hinder companies' ability to plan their sustainability efforts effectively. Lastly, the findings of this study suggest that the difficulties in supply chain coordination stem from the need for standardized and transparent emissions data reporting, along with the challenge of developing effective regulations to enforce these standards.

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Appendix

Appendix A - Semi-Structured Interview Guides

Guide for interviews with sustainability experts

Theme I: Personal background and role

- Can you describe your working background
- What is your role at [Company]
- What would you say is your main working responsibility

Theme II: Historical factors

- What factors led you to initiate the transition to sustainable transportation solutions?
- What political factors would you say have historically driven the transition to sustainable transportation solutions?

Theme III: present factors

- What does the political climate regarding the transition to sustainable transportation solutions look like in Sweden today?
- Which political issues would you say are most relevant for the transition to sustainable transportation solutions, such as electric trucks?
- Can you tell me about the challenges surrounding the changed diesel tax?
- Would you say that the SBTi is an effective tool for sustainability transition?
- What political/regulatory reasons do you see for people committing to SBTs?

Theme IV: Future factors

- How do you think the politics around sustainability initiatives will evolve during the coming years?

Guide for interviews with Manufacturers and Customers of Transportation

Theme I: Personal background and role

- Can you describe your working background
- What is your role at [Company]
- What would you say is your main working responsibility

Theme II: Questions regarding the SBTi

- What is your relationship with the SBTi?
- Can you describe the background and drivers for why [Company] has adopted the SBTi?
 - What stakeholders are the most driving in this commitment? (Customers, investors, owners, regulators/politicians, etc.)

- Why did you commit to the SBTi specifically?
- Have you committed to other climate initiatives? why/why not?
- If the industry had not taken the initiative, would you still have worked as you do today?
- Generally, what SBTs does [Company] have? (Near-/Long-term)
 - How does [Company's] supply chain look currently?
 - How important is cutting your transport emissions in achieving your SBT goals?
 - Within which scope are your transports currently categorized?
 - How do you think categorizing transportation emissions into different scopes affects the likelihood of achieving the set goals?
- What requirements do you impose on companies performing your transports? And how are these requirements linked to SBTi?
 - Do you think your transportation chain would have looked different if you had not adopted the SBTs?
 - Does your commitment to the SBTi affect the procurement of transports?
 - How do you think these requirements will change in the future?
- What opportunities and challenges exist currently regarding the SBTi, and how do you address them?
 - What is your plan to achieve your SBTs?
 - How are you progressing with your plan, and do you believe you will achieve your SBTs?
 - What regulations or political initiatives would you personally like to see if you could choose freely?
 - Do you think embracing the SBTi opens up new opportunities, such as attracting new customers?

Guide for interviews with Haulage Contractors

Theme I: Personal background and role

- Can you describe your working background
- What is your role at [Company]
- What would you say is your main working responsibility

Theme II: Questions regarding the SBTi and sustainability work

- What is your relationship with the SBTi?
- Do you as a haulage contractor have an active sustainability program?
 - Have you adopted any other climate initiatives? Why/Why not?
 - How are you progressing with your sustainability efforts?
 - If the industry had not taken the initiative, would you still have worked as you do today?

- What stakeholders are the most driving in this commitment regarding sustainable transport? (Customers, investors, owners, regulators/politicians, etc.)
- What opportunities and challenges exist currently regarding the SBTi, and how do you address them?
 - What regulations or political initiatives would you personally like to see if you could choose freely?

Theme III: Transportation procurement

- Do you as a company impose requirements on other companies that procure your services? If so, what are they?
 - Do you think your transportation chain would have looked different if you had not worked with sustainability targets?
 - Does your sustainability work affect the procurement of transports?
 - Do you think that these requirements from your side will change in the future?
- What is the relationship between demand and supply for sustainable transportation?
- Do the expectations for transportation align with the practical execution?

Appendix B - List of Original Quotes

Table 2: List of original quotes, with Swedish original quotes translated in the English column. The original quotes were from English-conducted interviews if the last column is empty .

Said by	Found in section	English	Swedish
CT8	4.1.1 Strategic considerations	“want to build integrity in the marketplace as well as internally and what that does will build long-term trust”	
CT6	4.1.1. Strategic considerations	“ticket to play”	
E2	4.1.1. Strategic considerations	“low-hanging fruit”	“lågt hängande frukt”
CT4	4.1.2. Stakeholder Demand and Internal Motivations	“investors are also a very large target group, many of whom evaluate the company based on sustainability”	“investorerna är också en väldigt stor målgrupp, där många av dem utvärderar bolaget baserat på hållbarhet.”
CT2	4.2.1. The Role of Transportations	“Our production corresponds to 80% of total emissions, ..., green truck transport is not a focus right now.”	
CT7	4.2.3. Achievability of SBTs	“this dynamic deserves big respect as it's not something that can be done easily; it involves a significant amount of work”	“denna dynamik förtjänar stor respekt eftersom det inte är någonting som kan göras lätt; det innebär en betydande mängd arbete”

CT1	5.1. Assessing Drivers for the SBTi Commitment	“have always strived to have that leadership position in sustainability in the industry”	
CT8	5.1. Assessing Drivers for the SBTi Commitment	“it becomes a question of the future and new potential market shares”	
CT2	5.2. Challenges of Achieving SBTs in the Transport Sector	"We wish to see clear and standardized ways of measuring CO ₂ . Much is unclear and changes quickly in sustainability, which makes us hesitant to commit until we know what the playing field looks like."	

DEPARTMENT OF TECHNOLOGY
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