Collective action within the pharmaceutical sector and lessons on taking effective climate action to reduce emissions:

A case study on Johnson & Johnson.

By

Jeroen van Paassen

Studentnumber: 4720970

September 15, 2023

Delft University of Technology

Faculty of Technology, Policy, and Management

Master Complex Systems Engineering and Management (CoSEM) 22-23

Graduation supervisors: A. Ghorbani & N. Goyal

TU Delft

Preface

Before you lie my thesis for completion of the Master Complex Systems Engineering and Management (CoSEM) at the Delft University of Technology. The title of my thesis is '' *Collective action within the pharmaceutical sector and lessons on taking effective climate action to reduce emissions: A case study on Johnson & Johnson.*''. A very relevant topic to explore since climate targets are becoming more and more ambitious and the reduction of scope 3 emissions requires engagement and collective action across supply chains. Hence, I hope that my research provides insights into this topic and how pharmaceutical companies could aim to tackle existing issues, even if it is on a very small scale.

I would like to thank my chair Prof. Dr. Amineh Ghorbani for guiding me through the process of writing my thesis. Due to your patience and continued support, I was able to develop a thesis that really had me interested from the start. Your expertise sent me in the right direction multiple times, and I really appreciate the time you invested in my research. Next, I want to thank my second supervisor, Dr. Nihit Goyal for his support and availability. Due to your help, I always had somewhere to go with my questions and your insights really helped me develop my thesis and understand how to make my research scientifically relevant. I also want to thank the participants of the interviews for their insights, I appreciate them a lot for taking the time to help me with my research.

Next, I want to thank my parents for their support and belief in me during my study years. And lastly, I want to thank my study friends, Yassir, Mustafa, and Mitchell. In the last 5 years, we have done a lot of projects together and we studied together a lot, and I am very grateful for meeting them and enjoyed working on projects together.

I hope that you enjoy reading this thesis and that it serves as a meaningful contribution to existing research on emission reduction collaborations.

Jeroen van Paassen

4729070

Delft, September 2023

Executive summary

Situation

The constant increase in global temperatures is becoming more and more concerning for the future of our planet. The health of the planet is crucial for our existence and for the health of humanity, which is why we need to maintain and care for our environment. The pharmaceutical sector contributes to a lot of greenhouse gas emissions, and the total amount of emissions even exceeds that of the automotive industry. Pharmaceutical companies' main goal is to improve human health, and therefore, contributing to a healthy environment is also crucial. Pharmaceutical companies have set ambitious climate goals that will need a lot of attention if they are to be fulfilled. More and more collective action initiatives are taking form, such as Energize and projects like Together for Sustainability (TfS). While a lot of progress is being made, collective efforts need to improve, and climate challenges need to be tackled collectively. Johnson & Johnson, as one of the largest pharmaceutical companies in the world, has committed to the SBTi targets and set ambitious goals for itself. They put a lot of emphasis on sustainability and aim to reach their targets across all its 250 subsidiary companies that are spread out over 60 countries.

Problem identification

As the climate impact of the pharmaceutical sector seems to be significantly large, it is important to understand how the climate targets of this sector can be fulfilled. Johnson & Johnson aims to source 100% of their electricity needs from renewable sources by 2025, achieve carbon neutrality for their operations, going beyond their Science-Based Target to reduce absolute Scope 1 and 2 emissions 60% from 2016 levels, and reduce absolute upstream value chain (Scope 3) emissions 20% from 2016 levels by 2030. They are currently on pace to meet their scope 1 and 2 targets. The scope 3 emissions, however, remain significantly larger than the scope 1 and 2 emissions combined. Scope 3 emissions come from other parties that a company works with, which makes influencing them more difficult. Collaboration is needed to stimulate companies across the value chain to contribute to sustainability. Collaboration could be in the form of various projects where companies engage in collective action to achieve certain common goals. Collective action means that multiple parties are engaged in a project that works towards a certain shared goal.

This research aims to explore the current challenges of the pharmaceutical sector with reaching emission targets and how collective action concepts impact the willingness of supplier companies to engage in collective initiatives that focus on reducing emissions. For this study, Johnson & Johnson will be analyzed to get a good understanding of the current state of the pharmaceutical sector.

Methodology

This research includes interviews with representatives from Johnson & Johnson, as well as from supplier companies. The interviews with representatives from Johnson & Johnson are intended to gain insights into current challenges and how Johnson & Johnson works towards their 2030 climate targets. The interviews with the supplier companies are intended to identify challenges for supplier companies with reducing greenhouse gas emissions, as well as understand what factors could stimulate them to contribute to collective action initiatives. The collective action framework helps us understand what

obstacles hinder companies from engaging in projects that aim to reduce greenhouse gas emissions, as it presents clear concepts that influence levels of cooperation.

With the use of Atlas.ti, the results of the interviews are analyzed, and reoccurring themes are identified. This is done with the use of re-occurrence analysis. For the interviews with the supplier companies, this helps us understand what factors are important to them when looking at collective action engagement.

Results

The interviews with the representatives of Johnson & Johnson gave insights into their climate efforts and sector-wide challenges. Technological constraints are very prevalent, and innovations are needed to further emission reduction activities. Limitations of electrical grids and a lack of technologies hinder companies who are aiming to reduce greenhouse gas emissions. Scope 3 emissions will be the largest challenge in the future, as it entails the largest part of emissions and requires supplier engagement. Data consistency and reporting of supplier companies also needs to improve, so that pharmaceutical companies can better assess the climate impact of their supply chain.

There are quite a few initiatives in place that focus on supporting smaller companies that have considerably less resources than large pharmaceutical companies. Ecovadis and Together for Sustainability aim to create a clearer view of a company's sustainability efforts. While programs like Energize aim to support companies in reducing greenhouse gas emissions by providing them with necessary knowledge and measures. Johnson & Johnson is often involved in such programs and aims to engage suppliers in climate activities, which signifies Johnson & Johnson's climate efforts.

The Atlas.ti coding showed what topics were most reoccurring and what topics were most frequently linked to ''levels of cooperation'', namely: linkage structure, subtractive or shared resources, the division of net benefits, and trust. By focusing on these factors and improving their value for supplier companies, engagement of these companies could be stimulated, and reaching scope 3 emission targets can be done more effectively for pharmaceutical companies. The findings of this research were in line with the literature. Additionally, the interviews indicated that ''shared or subtractive resources'' is also a factor that is important to supplier companies. Whether collective action concerns a shared or subtractive resource indicates whether the net benefit that a collective action focuses on is a common pool good or a public good. This is important to companies, as the interviews indicated since businesses prefer not to expose themselves to the opportunity that their business value is impacted negatively. Recommendations for pharmaceutical companies who aim to engage companies across their supply chain in emission reduction activities are therefore: cultivating trust-based relationships, promoting equitable divisions of net benefits, and optimizing linkage structures. The exact extent to which these collective action factors are significant to pharmaceutical and supplier companies is also important to understand, which could be explored in future research.

Keywords: Net-zero emission goals, multinationals, SBTi, support, Corporate social responsibility, climate action, institutions, policy, business, and innovation.

Contents

List of figures

List of tables

1. Introduction

1.1 Background

The earth's temperature today is about 1.1 ℃ warmer than it was in the late 19th century, and with rising emissions, this will only get worse. The United Nations claims that global temperature needs to be limited to 1.5 ℃ above pre-industrial levels to avert the worst impacts of climate change and preserve a livable planet (United Nations, 2022). To ensure that this value is not exceeded, emissions need to be reduced by 45% by 2030 and net zero emissions need to be reached by 2050. A global effort has been set in motion that has ensured that more than 70 countries have joined the Race to Zero.

The health of the planet is crucial for our existence and for the health of humanity, which is why we need to maintain and care for our environment. Pharmaceutical companies' main goal is to improve human health, and therefore, contributing to a healthy environment is also crucial. However, current climate impact of the pharmaceutical sector seems to be significant, as one article mentions: ''The pharmaceutical industry produces a large proportion of health system greenhouse gas (GHG) emissions, contributing to climate change.'' (Booth et al., 2023). Climate change impacts human health on multiple fronts, for instance it can cause a variety of diseases, primarily of the water borne and insect-vector types (Salt, 2003). This article also mentions the importance of the initiation of a global strategy for the pharmaceutical sector. Currently, carbon emissions of the pharmaceutical sector even exceed those of the automotive sector (Okereke, 2021), which is concerning.

The current climate target to limit rising global temperature to 1.5 ℃ needs to be tackled sector wide in order for it to be effective. Companies need each other to improve their emissions and work together to be more effective as a sector. Nearly all big pharmaceutical companies are working to build collaborative networks that may help them be more efficient (Iazzolino & Bozzo, 2022). The COVID-19 pandemic showed the world what a collaborative pharmaceutical sector is capable of and what impact collaboration within the sector can have (PharmaNewsIntelligence, 2022). The global collaboration between researchers, healthcare professionals, pharmaceutical companies, and industry leaders lead to the development and availability of vaccinations and treatments of COVID-19. As climate challenges are becoming more important, collaboration between pharmaceutical sector companies is still lagging. The collective action theory by Ostrom (1965) helps us understand what influences cooperation between companies. Internal, as well as external factors are analyzed to create an understanding of what hinders companies from collaborating. Understanding collective action within the pharmaceutical sector is pivotal in developing policies and initiatives to stimulate emission reductions.

In recent years, a lot of multinational companies with subsidiaries have set targets to reduce emissions and achieve net zero emissions across their value chains. According to the World Economic Forum, multinationals need to integrate Sustainable Development Goal (SDG) targets into their core business because it is good for their corporations and for the world (*5 ways multinationals can have a greater impact on the SDGs*, 2022). Their impact on the SDGs is greater than that of smaller companies. One study argues that a lot of multinationals with subsidiaries struggle to implement their Corporate Sustainability (CS) over the entire business, with some subsidiaries slacking and hindering the implementation of sustainability plans (Franco, 2021). This is especially the case with Multinational Decentralized Corporations since each office hosts a unique management structure ("The Four Types of Multinational Business", 2020). Unilever (Unilever PLC, 2022) and Shell (*Shell Global*, 2021) have for example also set hard targets for themselves to contribute to the global effort and achieve net zero emissions. These so-called multinational corporations exercise shareholder peer pressure on their subsidiaries that ensure that the corporative climate targets are achieved in all parts of the organization

(Immink et al., 2022). Subsidiaries in various countries are urged to act and implement interventions that are suitable for the environment in which they operate.

According to the UN: ''More than 3,000 businesses and financial institutions are working with the Science-Based Targets Initiative to reduce their emissions in line with climate science.'' (United Nations, 2022). The science-based targets initiative is a collaboration between corporations, the CDP, the United Nations Global Compact, World Resources Institute and the World Wide Fund for Nature (*Ambitious Corporate Climate Action*, 2022), and the goal is to help companies set targets for emission reduction that would help them in reaching the climate goals set by the government. The SBTi was founded with the help of large companies, and it can help corporations from various sectors with frameworks and tools as it provides best practices.

Even though the global effort has been set in motion, the current commitments from governments fall short of what is needed to reach the set targets for 2030 and 2050 (*Net Zero by 2050 – Analysis - IEA*, 2021). Many countries are not on track to reach their goals. In order for governments to achieve these targets, they need to engage their various industries to reduce emissions and work towards net zero emissions. As mentioned, the SBTi provides a framework for corporations to support them with their sustainability efforts. However, the most effective way in which companies can collaborate to engage in effective climate action toward net-zero emissions is still unclear. One study that discusses the roadmaps to net-zero emissions systems explains that differences across countries, model structures, and input assumptions make comparisons between companies difficult (Bistline, 2021). While the SBTi aims to help companies collaborate towards net-zero emission targets, the reality shows that the differences between companies can make it difficult to implement the same strategy to attain the same net-zero targets. So, while effort is being made, there are still enough problems at the company level with reducing emissions to achieve net zero in the set time span.

This research focuses on how effective collaboration toward climate action within the pharmaceutical sector can be realized. One company that has put a lot of effort into taking effective climate actions that works towards achieving net-zero emission goals is the multinational company Johnson & Johnson (also referred to as; JnJ). Johnsen & Johnsen is a company that consists of various subsidiaries within the pharmaceutical and healthcare environment. They have acquired various companies over the years, making them subsidiaries under the Johnson & Johnson banner. As of today the company includes 250 subsidiary companies with operations in 60 countries and products sold in over 175 countries. In 2016, they committed to SBTi targets on 3 levels. By 2025 they aim to source 100% of their electricity needs from renewable sources and by 2030 they aim to achieve a reduction of 60% on scope 1 and 2 emissions and reduce scope 3 emissions by 20% (*Johnson and Johnson*, 2022). Scope 1 emissions entail all the greenhouse gas (GHG) emissions that occur directly from a company's sources, scope 2 emissions are indirect GHG emissions from the consumption of purchased electricity, heat, and steam. Scope 3 emissions are: ''other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.'' (*FAQs - Science Based Targets*, 2023). Johnson & Johnson has also stated that its ambition is to reach net-zero emissions across its value chain by 2045. Reaching that ambition is highly dependent on the progress of their current short-term sustainability plans. While all companies have their difficulties and challenges, Johnson & Johnson has really made positive strides towards climate action, which is signified by their inclusion in the Carbon Disclosure Project A list of 2022 (*A list companies*, 2022). They were included because of their environmental transparency and performance on climate change.

Johnson & Johnson has a decentralized organizational structure, which provides freedom and autonomy for managers and employees through various functional groups (Organimi, 2022). Across operational and business units, employees are better able to adapt to the needs of various markets and to serve better within them. The same article argues that while there are disadvantages to this business structure, Johnson & Johnson has been one of the few large organizations that have managed to adopt this structure very well. Their strategic framework has played a big part in this success. Managers who represent key operations of each business segment or specialized functional operation are assembled in the Group Operating Committee, which has the duty to oversee and coordinate domestic and international companies related to each of the segments (*Johnson & Johnson - Organizational Structure*, 2020). It is also stated in one article that Johnson & Johnson leverages its decentralized structure for a better working environment and in that way benefits from less top-management control (Francis, 2021). Achieving the SBTi emission targets is also relevant for their subsidiary Janssen (*Our Targets & Our Progress*, 2022), which is their pharmaceuticals company that operates under the Johnson & Johnson banner. This shows that the SBTi targets are also relevant for the subsidiary companies of Johnson & Johnson.

As for their progress, in 2021 their scope 1 and 2 targets had been reached by 60%, which is very decent since the period for these targets is 2016 to 2030 (*Progress data dashboard - Science Based Targets*, 2021). Their scope 3 target had been reached by 17% in 2021. This already indicates that reducing emissions for outsourced activities that are not controlled by the company itself is more difficult for Johnson & Johnson. Scope 3 emissions seem to be the biggest hurdle for Johnson & Johnson, as well as for other pharmaceutical companies. This means that the emissions of suppliers of pharmaceutical products are crucial for achieving their emission targets. This study dives into the challenges of reducing scope 3 emissions and the importance of collaborating with other companies and understanding how collaborations can be improved to reduce emissions. Johnson & Johnson is an interesting case because their approach to business seems to support effective climate action on lower levels of the company. This study therefore aims to understand the company's challenges and approach to climate action.

1.2 Literature results and knowledge gap

The earth's temperature has been steadily rising since the end of the 19th century, which begs the question of what benchmarks need to be met to halt this constant increase. What factors do policymakers look at when making the new global climate agreements, and what are these benchmarks? According to one study, halting global warming requires virtually zero annual CO2 emissions (Rogelj et al., 2015). Policymakers make use of concepts like carbon neutrality, climate neutrality, full decarbonization, and net zero carbon or net zero greenhouse gas (GHG) to define global benchmarks for achieving temperature targets. Rogelj et al. conclude that net zero emission targets are a useful focal point for policymaking since it links a global temperature target and socioeconomic pathways to a long-term limit on cumulative CO2 emissions. Appendix A gives an overview of the literature found that contributes to the exploration of the problem situation for this study. The most important results are discussed in this section.

For the 2050 net-zero initiative to be successful in the US, a massive commitment of new resources and effective mobilization of government, the private sector, and energy consumers are necessary (Deutch, 2020). Deutch mentions that fundamental change is needed in the private sector, where investment decisions between corporations are based on price signals, as well as congressional oversight. The need for development in the private sector is clear, but the way in which corporations can collaborate to work towards net-zero emissions remains incomplete.

The global temperature goals have stimulated a lot of companies to contribute to decreasing CO2 emissions and focus on working towards net-zero emissions. According to one study, the development of net-zero targets at the company level cannot be done by only involving natural scientists or economists. The article mentions: ‘’ Ethicists and social scientists are needed to help explore how fairness concepts apply to today’s multinational corporations — which span multiple countries and sectors, and involve staff on incomes ranging from the lowest to the highest. ‘’ (Rogelj, 2021). The role of, customer pressure, and regulatory control toward environmental performance is crucial in improving green production in corporations (Zameer et al., 2021). Only managerial environmental awareness directly influences environmental performance. One knowledge gap is thus that the feasibility of these goals is still unknown, especially for a company that must deal with its large amount of subsidiaries, which generally makes achieving these goals complex.

Corporate social responsibility (CSR) and the commitment of firms to climate action are crucial for the sustainable development of a corporation. Engaging in corporate social responsibility activities means that an organization plays a positive role in the community and considers the environmental and social impact of business decisions. The literature shows that low awareness from actors and unfavorable attributions of corporate social responsibility activities impede efforts to maximize business benefits from those activities (Lindgreen & Swaen, 2010). According to another article, the main drivers of corporate social responsibility actions are: motivated individuals and the anticipation of future success being dependent on more institutional drivers (Matten & Moon, 2004). A case study on Johnson & Johnson provides evidence that the implementation of social and environmental goals can go hand in hand with sustainable profitability (Turcsanyi & Sisaye, 2013). They also mention that CSR and sustainability have contributed to the economic performance of Johnson & Johnson. Hill et al (2003) elaborate on this and argue that Johnson & Johnson has been committed to corporate social responsibility for a long time now and it has brought benefits for the company on multiple fronts, including public image and business operations.

According to the literature, multinational corporations play a significant role in the fulfilment of emission targets in host countries (López et al, 2023). If they decide to adapt stricter Intended Nationally Determined Contributions (INDC) than set by the local governments, the reduction of emissions would be even bigger. Immink et al. (2022) discuss that there is a balance between the human right principle and the capacity within a country to implement a decarbonization trajectory. So, while net zero emission targets are often clear from top to bottom, realizing them in host countries requires careful analysis and understanding of the local environment.

The Johnson & Johnson strategic framework has proven to be a successful formula and is comprised of three components: the Foundation, Strategic Principles, and Growth Drivers. In an interview with a representative from Johnson & Johnson, the following is stated: ‘’ Procuring renewable energy can be difficult in certain countries and we have found it to be quite a steep learning curve. For example, in Asia, where some governments own the generation sources and grid, multinational companies may not have access to procure renewables directly. In such cases, we must act as advocates for access in the hopes that our voice, combined with others, will draw attention to the need for policy changes. ‘’ (Alessandro du Besse’ - Tech Editor, 2018). The multinational company stimulates its employees to contribute to environmental sustainability initiatives and provides funds to help realize cross-border projects.

Maina (2021) presents the challenges of a Johnson & Johnson case in Africa that arose with implementing corporate social responsibility strategies of the main corporation. Challenges arose in the context of the micro, as well as of the macro environment and indicated challenges that the Multinational Enterprise had with coordinating CSR activities in foreign environments. Johnson & Johnson is guided

by a one page document called; ''Our Credo'' and has a distinct board that deals with the CSR initiatives all over the world. The Johnson & Johnson case provides insights into how subsidiary companies can collaborate to engage in effective climate actions toward net-zero emissions. As mentioned above, the private sector needs to improve its effective climate actions to achieve net-zero emissions, and the Johnson & Johnson case can provide useful lessons and frameworks for this. Understanding the coordination mechanisms for multinationals with their subsidiaries can provide insights into how emissions reductions could be achieved on a larger scale.

Liou and Rao-Nicholson discuss the foreign subsidiary perspective of MNE's who aim to achieve their SDGs (Liou & Rao-Nicholson, 2020). They argue that the local stakeholder demands determine the identity of subsidiaries and this strongly impacts the implementation of SDGs in the given country. Also, the subsidiary's identification with its main organization plays a critical role in achieving SDGs that impact the operations of the company and its business networks like suppliers and customers. It is thus important to understand the relationship and collaboration between the subsidiary and MNE. If they heavily identify with one another, the implementation of SDGs generally goes a lot smoother which brings significant results for the MNE's climate impact. Climate change is a huge social science problem that demands that we evolve decision-making across a complex set of multi-level collective action relationships (York et al., 2021). The same article mentions that the most important factors that influence the multi-scale response to climate change are the inter-level feedback processes, the roles of individuals and organizations in promoting trust within and across levels, the importance of establishing and communicating norms, and the inclusion of worldviews to situate decision-makers within narratives of climate change. For MNEs to effectively tackle climate issues, it is thus very important to take these factors into account.

Rycroft et al. (2015) explain that collective action is often hindered by competition law, in the sense that over-sharing of companies can lead to an increase in competition and a loss of market value. However, collaboration on shared or industry-wide challenges can prove very useful for multiple parties. One study about the importance of organizational collaboration in healthcare emphasizes that bringing research users and producers closer together could lead to more effective implementations (Rycroft-Malone et al., 2015). There are multiple factors that influence the effectiveness of collective action in healthcare, such as the foundational relationships, visions, values, structures and processes, and views concerning the type of collaboration and implementation within the sector. Mintz delved into this topic by researching the corporate characteristics that influence intercorporate coalition formation (Mintz, 1995). The influence of corporate political activity on individual firms' self-interest is significant, which is concluded based on the differences of interest in relation to healthcare profitability. As more and more pressure is being put on the pharmaceutical industry to reduce greenhouse gas emissions, tackling climate challenges is becoming a sector-wide goal. Collective action could benefit all parties involved, by providing companies with more incentives and net benefits.

Feiock (2013) wrote his research on the institutional collective action framework and the dilemmas that institutions face in different scenarios where collective action is prevalent. To emphasize the need for collective action on the institutional level to improve overall net benefits, he stated: ''If local actors pursue strategies based on their short-term interests, then the collective action problem dictates that the outcomes of individual decisions will be collectively inefficient in the absence of mechanisms to integrate decisions across policies and/or jurisdictions.'' (Feiock, 2013). This reinforces the need for collective action and calls on enterprises to engage in sector-wide projects.

One article that discussed collective action in the case of the COVID-19 pandemic argues that trust is a key factor for engaging participant in large scale collective action (Harring et al., 2021). They discuss that reciprocal trust is key in stimulating citizens to engage in collective action, and that governments

need to trust citizens that they will turn recommendations from their part into a collective action. While this article does focus on a specific common goal, namely limiting the spreading of COVID-19, it provides an insight into the importance of trust within collective action. Another paper discusses the importance of the allocation of costs and benefits (Feiock et al., 2000). on the engagement in collective action. They mention that the selective costs benefits has more impact on the local boundaries of actors than the collective costs and benefits. This means that actors are more likely to engage in collective action if the distribution of net benefits is more in their favor, than if the collective net benefits improve in general. This also indicates the importance of linkage structure in collective action, as it discusses how the agreements and institutions affect the choices of actors to participate or invest in a collective action.

As collective action has become a more reoccurring theme within the pharmaceutical sector and with climate change being one of the most important social science challenges of today, theory on collective action towards climate change is becoming more and more relevant. The knowledge gap that this research focuses on is the absence of research on successful collaborative action within the pharmaceutical sector that helps to achieve climate targets, and what factors are especially impactful for collective action within this sector. This research thus focuses on the outcomes of climate targets with the help of collective action and how companies across the supply chain can be engaged in sector-wide projects more effectively.

1.3 Research relevance

This research has societal relevance because it focuses on averting the worst impacts of climate change and preserving a livable planet. The scientific relevance of this proposed research is that it contributes to the state of art scientific knowledge by providing insights into how corporations can successfully collaborate to obtain net-zero emissions in a particular sector, more about this in the next chapter. This research has a clear engineering component, in the sense that the collective actions of different companies are designed in a certain way that has room for substantial improvements. There are also technical issues that are prevalent with the coordination between companies that are focused on reducing emissions with technical processes that are necessary for their businesses. It is a complex problem since it involves many actors and business processes on institutional levels. This study contributes to the CoSEM landscape by analyzing the complex nature of the existing collaborations between certain enterprises that have committed to 2030 emission targets and it draws lessons for how other multinational companies can improve their business operations and reduce their carbon footprint by engaging in collective action activities. Furthermore, this research tackles sustainable development goals (SDGs) as discussed before, specifically tackling climate action (SDG 13). The reduction of greenhouse gas emissions on behalf of the pharmaceutical industry contributes to climate action, and the focus of this research thus aims to contribute to the SDGs. Contributing to the SDGs indicates that this research has societal relevance, since the SDGs are established to provide a blueprint for peace and prosperity for people and the planet, now and into the future (*THE 17 GOALS | Sustainable Development*, 2023). This study also aims to provide insights into the importance of collective action concepts in a large sector-wide setting. Understanding what factors are important to companies can help policy-makers and large ambitious corporations tackle emission reduction more effectively by improving collective efforts and engaging other companies across the pharmaceutical supply chains.

1.4 Research approach and questions

This study will be done with the use of a qualitative research approach. Qualitative research helps understand how individuals in an environment experience a problem or situation (Creswell, 2009). This research approach helps identify specific cases and challenges that are prevalent in these settings. Since this research focuses particularly on the Johnson & Johnson case, this approach is fitting. This research is inductive explorative, meaning data is explored to identify reoccurring phenomena. Within organizational science, rigorous inductive research aimed at phenomenon detection is important because a balance between inductive and deductive research is crucial (Jebb et al., 2017).

The Johnson & Johnson situation will be analyzed with a case study approach by delving into the existing literature and conducting interviews. The case study approach allows for in-depth and multi-faceted explorations of complex issues in their environment (Crowe et al., 2011). The goal of the case study is thus to explain complex social phenomena to identify existing problems within these company environments. This also means that a descriptive analysis will be done on the Johnson & Johnson case by delving into the literature. The goal is to fully understand the company and to draw conclusions on existing research that has been done in this field. Snyder (2019) argues that literature reviews can serve as a basis for knowledge development, can create guidelines for policy and practice, can provide evidence of certain effects, and can have the capacity to engender new ideas and directions in certain research fields. The descriptive analysis is fundamental to the research, as it helps us understand the Johnson & Johnson case.

To address the knowledge gap, the Dutch and Belgian subsidiaries of Johnson & Johnson are analyzed. The Netherlands and Belgium are home to multiple Johnson & Johnson institutions. Analyzing these subsidiaries is very useful and feasible to gain insights into collaborative climate action because the companies work on the same level (layer 3) of William's scheme (*Four Layer Model of Institutions*, 2016) and deal with the same type of policies, rules, and regulations set by the Dutch, Belgian, and European governing bodies (see figure 1). By assessing the differences and collaborative efforts of the subsidiaries, the knowledge gap can be tackled, and insights can be obtained on how a multinational corporation can successfully collaborate with subsidiaries and suppliers to achieve their climate targets. Following the knowledge gap, the main research question is as follows:

How can Johnson & Johnson improve their collaborative efforts to reduce emissions and satisfy their 2030 emission targets?

The sub-questions help understand the case of Johnson & Johnson and it provides insights into the attainability of the emission goals of larger companies. These sub-questions help provide information on how Johnson & Johnson's subsidiaries try to achieve the emission targets and what actions are necessary to achieve the climate targets sector-wide. Understanding how Johnson & Johnson operates as an institution is important to understand the extent of their collaboration activities. The sub-questions that will help understand the situation and answer the main question are as follows:

[1] What is the organizational structure of Johnson & Johnson and what are the characteristics of the subsidiaries?

The first sub-question helps us understand the current environment of Johnson & Johnson and the company structure. To understand the company's climate efforts and impact it is important to fully grasp their nature and the ways in which they operate across business segments. By doing a descriptive analysis of the company, we will show how they are organized and how they work towards climate and emission targets.

[2] What are the plans of Johnson & Johnson for achieving the emission goals and how is this communicated within the company?

The second sub-question delves into the specific climate efforts and company initiatives of Johnson & Johnson. This question is important to understand their goals and ambitions. Understanding these helps us better understand the company and the targets that need to be achieved. It is important to understand how Johnson & Johnson collaborates with suppliers and other companies to reduce emissions. In that way, we can draw conclusions about their current environment.

[3] What are current initiatives within the pharmaceutical sector that have a positive effect on emission reduction, that Johnson & Johnson is involved with?

The third sub-question helps explain what current sector specific activities are organized to tackle climate issues, and in what projects Johnson & Johnson is involved. This helps us understand what initiatives have been successful or seem to be promising for a larger part of the sector. Tackling climate issues requires big initiatives that are often done collectively, which is why exploring current initiatives is very relevant. This sub-question will help understand what initiatives could be interesting to focus on and what problems still need attention from a collective action standpoint.

[4] What are the challenges that Johnson & Johnson faces with the implementation and coordination of the emissions goals set by the main corporation?

The next sub-question helps identify points of improvement and reoccurring problems with achieving emission targets for Johnson & Johnson. It is also important to understand if the emission goals are similar for pharmaceutical companies and if challenges correspond with other corporations. Identifying challenges helps us understand where collaborative efforts could be improved and how companies can contribute to a collective action that leads to emission reductions sector wide.

[5] How can challenges be addressed from a collective action standpoint across the value-chain by Johnson & Johnson?

This final sub-question links all the earlier questions together, as it connects the collective action initiatives to existing challenges across the pharmaceutical sector, with the case of Johnson & Johnson. The main research question can now be answered, since this question can be linked to the opportunities that Johnson & Johnson could take to improve emission reductions by engaging suppliers and other companies in collective action. This is an explorative question, as this is an explorative study on Johnson & Johnson and the pharmaceutical sector. The goal of this question is to contribute to existing collective action initiatives and to see where improvements can be made, and to identify what obstacles need to be tackled within the pharmaceutical sector.

The collective action theory stands central in this research. As mentioned before, collective action within the corporate world is becoming more and more important, especially with the climate targets becoming more difficult to achieve over time. Olson's collective action theory helps analyze how different companies can be motivated to collaborate on challenges and what benefits it may bring sector-wide (Olson, 1965), more on this in the next chapter.

As there appears to be a lot of net benefits underlying the collective action initiatives within the pharmaceutical sector, stimulating this could be interesting to multinational pharmaceutical companies, as well as to government bodies. Net benefits could be financial incentives, emission reductions and improved reputations and collaborations. This study will explore how companies can collaborate to reduce greenhouse gas emissions and how they can engage others to contribute to climate efforts was well. The collective action framework suggests that a higher level of cooperation leads to more net

benefits for the participants. This could also be the case for the pharmaceutical sector, as the literature review showed that collaboration efforts on the healthcare front can bring various benefits sector-wide.

The institutional four-layer framework by Williamson (*Four Layer Model of Institutions*, 2016) describes the differences between institutional levels and how they interact with each other. Figure 1 shows the scheme and what levels interact with one another. The multinational corporation operates on the institutional level, making sure that the governance structure of the company is correct so that subsidiaries can effectively exercise their business processes. So while multinationals work on higher levels, the subsidiaries try to achieve their goals on the local governance level, which is in line with how their boundaries are set by the higher levels. Johnson & Johnson also operates on different levels of Williamson's scheme, which is important to consider for this research. The four-layer scheme of Williamson helps understand the interactions between institutional levels and how multinationals operate to coordinate businesses on lower levels. Comyns (2018) provides a framework that combines the institutional perspective with multinational typology and helps explain how institutional pressure influences greenhouse gas emissions data quality and the standardization of reporting practices. This framework is not leading for this research, but it is important for understanding the Johnson & Johnson case and the way that MNEs operate in general.

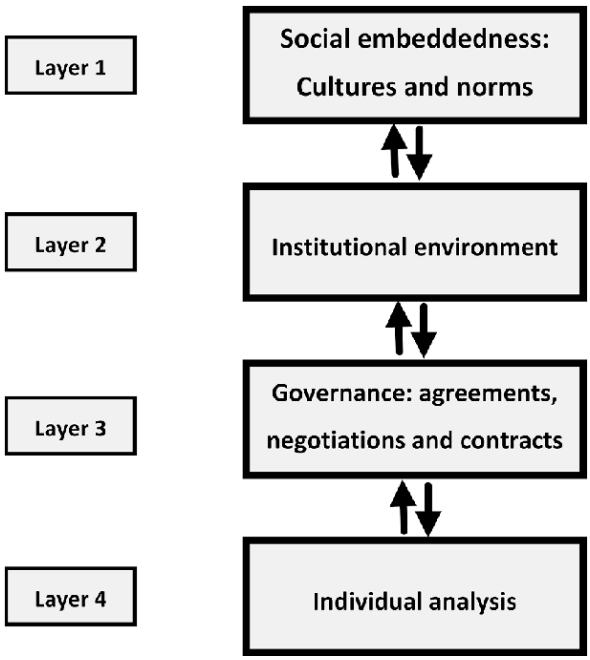

Figure 1: The levels of Williamson's scheme (The four-layer model of Williamson [106], 2022)

1.5 Structure of thesis

This thesis continues by delving into the theoretical background in Chapter 2, where the implication of the collective action theory will be elaborately described. Then, the methodology will be discussed in chapter 3. Chapter 4 will provide an in-depth descriptive analysis of the Johnson & Johnson case. Next, chapter 5 will provide an analysis of the interviews and background research. Then, the discussion and interpretation will follow in Chapter 6. And lastly, conclusions and recommendations will be made.

2. Theoretical background

2.1 Collective action theory

Mancur Olson published The Logic of Collective Action in 1965. His research explained that there are issues underlying collective actions to provide public goods (Olson, 1965). Free riding and group sizing are both equally important for the result of collective action. Collective action has the goal to improve the result of a common interest and to be more efficient than tackling these public good-related issues individually. With his theory he emphasizes the importance of the sociological perspective of decision-making. He later also argued that the tendency of certain groups to engage in collective action to act in their common interest is very significant since it often plays a central conceptual role (Olson, 1989). Collective action is to be expected in situations where common goals are prevalent.

Continuing the collective action theory, Elinor Ostrom elaborated on the development of important norms in collective actions (Ostrom, 2009). She proposed certain fundamental relationships and norms that have been empirically observed to influence the likelihood of achieving successful collective action. Figure 2 shows the core norms that are important in the collective action theory according to her research. According to Ostrom, participants of collective action often imitate the behavioral norms of other participants. This means that when these participants have trust in others' cooperation, they themselves are more likely to cooperate and join the collective action. Thus, the key to successful cooperation and a good result of a collective action initiative lies in the trust that others will reciprocate trustworthiness. This trust is in turn strengthened by the memory of someone's reputation. This means that participants of the collective action can help others to develop trust in them by establishing a reputation through repeated interactions. In short, at the center of the collective action theory are the core relationships that have significant impact on participants motivations to join a collective action initiative. The reputation of participants is important because it supports trust, with good trust, cooperation and reciprocity are stimulated. Thus, trust is very fundamental within this framework. When these core relationships are established, net benefits with follow for the entire industry in which the issues take place. The basis of the collective action theory is thus that social actors regularly assess the actions taken by others to decide for themselves if they want to cooperate in a collective action project. Adding to the collective action theory, DeMarrais and Earle emphasize the importance of analyzing agencies at multiple levels as well as the importance of how institutions articulate shared interests and order sociopolitical and economic interaction (DeMarrais & Earle, 2017). As collaborative efforts toward climate action seem to be more needed nowadays, transparency and trust between companies are becoming even more important. Trustworthiness is thus fundamental and companies looking to enter collective action initiatives have various options for analyzing other participants.

2.2 Types of collective action

To understand the entire context of the collective action framework within the pharmaceutical sector, it is important to define what type of collective action problem is involved. According to Olivier (N), depending on the source of disagreement between actors and the consequences of their opportunistic behavior. These three types are coordination problems, cooperation problems, and division problems. As this study focusses on the collective efforts of the pharmaceutical industry to achieve emission targets and the engagement of companies to cooperate to achieve these targets, the most relevant issue for this analysis is the cooperation problems. Cooperation problems arise when involved actors have different goals and could be inclined to behave opportunistically. Companies within the pharmaceutical sector are very rarely linked organizationally and this means that every organization could have different goals

and incentives for climate action. While governments committed to the global effort to halt global warming require these corporations to operate sustainably, the emission targets of MNE's, as well as of SME's can vary significantly. As discussed in the introduction, Johnson & Johnson has very ambitious emission targets, and is dependent on other companies to achieve all these targets. This is because reducing scope 3 emissions requires your supplier companies and all products and services that you purchase to be sustainable and climate friendly. Cooperation of supplier and other companies that they collaborate with is thus the most relevant problem with achieving their emission targets.

2.3 Collective action framework

Figure 2 shows the visualization of the framework of collective action. This framework establishes the specific relationships between actors involved in taking collective action, allowing for the examination of the level of cooperation among pharmaceutical sector collaborations in response to external variables. This aligns with the research question of the thesis, as it questions what factors are important for healthcare companies to improve collaboration within the sector. Therefore, the collective action framework is a suitable theoretical framework for this study. The various external variables all impact the framework in their own way, which is also true for the pharmaceutical sector.

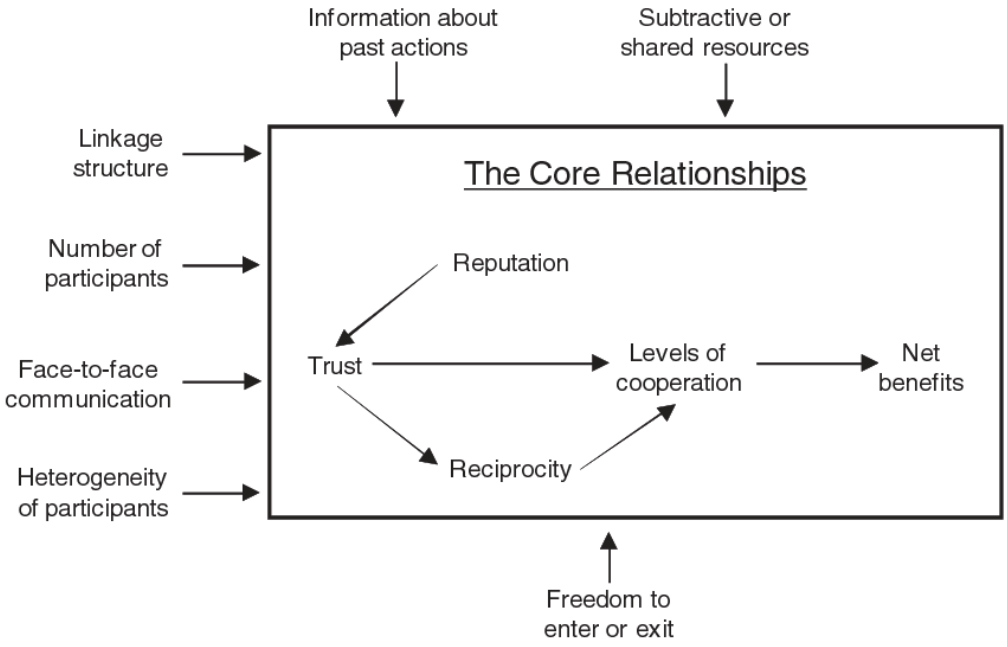

Figure 2: Collective action framework (Ostrom, 2009)

The history of past actions between individuals has a significant effect on whether they will trust each other or not. The more parties know about each other, the higher the chance of building trust is. Experiences create familiarity and can lead to a positive effect on relations. The greater amount of information individuals have about each other's past behaviors, the more accurately they can form an understanding of their peers' reputations. For the pharmaceutical sector this can be measured in the form of past interactions and acquittance with other companies.

Whether a good is subtractive or shared has a great impact on collaborative actions. Companies tend to be more motivated and inclined to work together when the issue is non-competitive (eTOPSign, 2022). With shared resources, it is easier for companies to share data and best practices, as it does not negatively

affect them doing so. For this research, this variable is rather constant, as it concerns non-competitive matters, such as knowledge and development of business processes that help companies be more sustainable. The resources that this study focuses on are products that every company in the supply chain and sector can benefit from.

The arrangement of connections or linkages among participants in a social dilemma has an impact on their cooperative behavior. Companies within a collective action can be interdependent, making it more likely for free riders to be detected. A linkage structure could also be one where all companies engaged can benefit from the products and information generated from the collective action. Such an alternative linkage structure could involve a generalized pool, where all participants benefit collectively. In this case, free riders are less likely to be noticed, which discourages cooperation. Another type of linkage structure is hierarchical, where command and control mechanisms are in place to direct the behavior of individuals lower in the hierarchy. This linkage structure requires more steering and control, which makes it more costly overall. This could impact net benefits and also discourage cooperation. The linkage structure is very important for tackling the climate issues in the pharmaceutical sector, as participants' engagement is highly dependent on the share of benefits and credits that they receive.

The number of participants for the collective action on emission reduction within the pharmaceutical sector is highly important. pharmaceutical companies have a lot of interest in sustainability projects and if they themselves commit to innovation and development, other companies could decide to free-ride. Commitment of various organizations in the sector is necessary because input needs to be coming from more organizations. The more organizations can contribute, the more likely other companies are inclined to engage in collective action. The number of participants can be connected to the overall net benefit that a collective action brings, but there could also be positive network effects that come with increased participation, which could lead to even better levels of cooperation.

Face-to-face communication makes people familiar with each other and helps build a connection between individuals. For large scale projects with major corporations involved, this effect could be limited, but it is important to consider, nonetheless. Familiarity brings trust and reputation, which could be very important motivations for companies to make decisions on whether they want to join collective action initiatives.

Heterogeneity between participants can sometimes be desired. It could lead to certain parties involved being highly motivated and stimulating others to collaborate. With contributing companies having different backgrounds, business processes and end products, a lot of different experiences and best practices could be shared within the pharmaceutical sector. Heterogeneity could prove to be very desired for companies involved, as organizations on various levels on the value chain depend on each other for reducing CO2 emissions. For example, pharmaceutical companies are highly dependent on suppliers to achieve their ambitious emission reduction targets. Therefore, these large pharmaceutical companies could desire a high heterogeneity within the collective action. This is something that the analysis will delve deeper into. Heterogeneity can also be in the form of how different organizations are rewarded within a collective action. Sometimes some organizations contribute more or have a bigger share in a collective action, which could lead to heterogeneity in payouts of the net benefits. When payouts are unequal, this could seem unfair, but in reality this could prove beneficial for the results of the collective action. Heterogeneity could also lead to dissatisfaction and parties less willing to cooperate. It is important to treat everyone involved in a fair manner and provide everyone with sufficient information.

Another important variable is the freedom to enter or exit. Companies could be inclined to participate to help improve the climate efforts of their business processes, as well as from the entire sector. Yet, engaging in collective action means they will have to contribute and put effort in to achieve results for

potentially all participants. No freedom to exit a collective action could prevent companies from participating, as it is much more of a commitment in that case. However, when participants have the possibility to leave a collective action, other companies could be less motivated to engage, since you can't rely on others' contributions as much as they would like. This factor is interesting to investigate because the willingness of pharmaceutical companies and suppliers to contribute to collective action initiatives will become clearer after analyzing their behavior in certain settings.

3. Methodology

For this study, a qualitative research approach is used. This approach is well suited to understand the existing problems within the pharmaceutical sector when it comes to working on environmental problems as a collective action, as it allows us to analyze individuals who have a lot of experience within these environments.

3.1 Case study

This research explores the collective action efforts of the pharmaceutical industry by analyzing the Johnson & Johnson case. As discussed earlier, they have made a lot of progress and are on schedule to achieve their 2030 emission targets. The goal of the case study is thus to understand their efforts and collaborations within the multinational company as well as sector wide. The case study will focus on Johnson & Johnson's top-down approach, as well as the local subsidiary approach of the pharmaceutical companies that work under the Johnson & Johnson banner. This means that this study will look at the approach of the company on the larger level (corporate, company headquarters), as well as on the lower levels (subsidiaries).

3.2 Empirical research

To obtain the discussed data for answering the sub-questions, fitting research methods must be selected. First, literature research must be conducted to obtain existing information on the case and to develop an understanding of the current situation. This will be done by conducting desk research and analyzing grey literature that explores the current collaborative efforts of subsidiaries and aspects that come with it. The literature research will also provide information on what already is known about the Johnson & Johnson case and how they operate. The availability of data is very important for the next step of the research, which is the interviews. The interviews are a big part of this research methodology, as the approach overall is a qualitative one. The interviews are there to complement the information that is available on the Johnson & Johnson case. The interviews will be semi-structured and therefore need to be done with correspondents who work in comparable functions. The case selection criteria are shown in table 1 and 2. To keep the scope small and to minimize external factors like politics, resources and technology from collective action initiatives, the companies must be located within Belgium or the Netherlands. It must be a multinational company, as discussed in the literature review, so that there is a clear subsidiary component for the analysis. The correspondents need to have a function at the company that involves the energy transition and environmental and sustainability activities. To add to the analysis, another Dutch pharmaceutical company is used for the analysis, to obtain further insights from within the pharmaceutical industry.

Table 1: Case selection criteria pharmaceutical companies

Criteria	Requirement
Location	Within Belgium or the Netherlands
Company size	Multinational with 50k+ employees
Branch	Pharmaceutical company
Company	Johnson & Johnson, Janssen Pharmaceuticals, a pharmaceutical company
Function	Involvement in the energy transition, and environment & sustainability

Table 2: Case selection criteria suppliers

Criteria	Requirement
Location	Has business operations in Belgium or the Netherlands
Branch	Chemicals, products, services, or med tech devices
Involvement in pharmaceutical sector	Provides their products or services to among others, the pharmaceutical sector
Function	Involvement in the energy transition, and environment & sustainability

These case selection criteria led to the selection of the following interviews. The first couple of interviews are done with employees of different Johnson & Johnson institutions within Belgium and the Netherlands, as well as with an employee of the headquarters in the United States. To add to this, an interview will be held with an employee of another multinational pharmaceutical company within the Netherlands, which will be used to provide another point of view on the current state of the emission efforts of the pharmaceutical industry.

There was a total of 8 interviewees, who had different backgrounds. Table 3 gives an overview of all the interviews and how they contribute to this study with their perspective. The interviewees' names are anonymized to preserve their privacy. It is important to note that some of the companies of the interviewees do more than is shown in the table, but the company activities that are relevant for the pharmaceutical sector are shown just to provide a short overview.

Table 3: An overview of the interviewees

Referred to as	Company background	Company activities
Interviewee A	Johnson & Johnson headquarters	Pharmaceutical industry, medical and consumer branches
Interviewee B	Janssen Pharmaceutical	Pharmaceutical industry
Interviewee C	Janssen Pharmaceutical	Pharmaceutical industry
Interviewee D	Janssen Pharmaceutical	Pharmaceutical industry
Interviewee E	Pharmaceutical company	Pharmaceutical industry, animal health
Interviewee F	Supplier company	Producing chemicals
Interviewee G	Supplier company	Producing plastics

Interviewee H	Supplier company	Medical equipment, analytical instruments, and more

The interviews were all semi structured, with different questions for the pharmaceutical companies and the supplier companies. Here is an overview of the general questions that were asked in the interviews. These questions functioned as guidance for the interviews, but the interviews also gave the freedom to the interviewees to discuss topics that they found relevant. This helped with the research as it provides more insight in the view of these employees of companies and what they think is important for reducing emissions and improving collaborative efforts.

Topics discussed in interviews with correspondents from pharmaceutical companies:

1. *Sustainability goals coordinated within company.*
2. *Reduction of scope 1, 2, and 3 emissions, sustainability changes/activities.*
3. *Company efforts on climate action.*
4. *Effectivity of company's approach.*
5. *Challenges with facing climate targets.*
6. *Efforts to tackle these challenges.*
7. *Perspective on future climate targets and challenges.*
8. *Collaborative efforts and opportunities to reduce greenhouse gas (GHG) emissions.*

Topics discussed in interviews with correspondents from supplier companies:

1. *Company sustainability activities to reduce emissions.*
2. *Challenges with climate targets.*
3. *Customer requirements in terms of sustainability and emissions.*
4. *Collaboration projects within the pharmaceutical sector to improve sustainability.*
5. *Factors that influence the degree of cooperation on climate action and reduction of emissions. (Trust, reputation, reciprocity, distribution of benefits of a collaboration, etcetera)*
6. *Factors that influence the motivation to participate in a collaboration. (The number of participants, the number of face-to-face contacts, the type of companies involved, the possibility to stop at any time, etcetera)*
7. *Opportunities for improvement within the sector, to stimulate collaboration and improve the climate impact of the pharmaceutical sector.*

3.3 Data requirements

To conclude reasonable findings, accurate and valid data is needed. The sub-questions address the existing gaps that will be tackled with quantitative data. This will be in the form of data from desk research, grey literature, and other empirical data. The data will give insights into how the Johnson & Johnson organization is structured. The data for these questions will be gathered by delving into the literature that contains organizational information about Johnson & Johnson and provides insights into the current operational activities within the company and between subsidiaries. The requirement for this data is that there is a wide sample of data available and that there are multiple stakeholders whom the information comes from. This ensures the information that is found and ensures that the correct conclusions are drawn. Different data is also required to address the gaps. Qualitative data is needed on the specific case that is Johnson & Johnson within the Netherlands and Belgium. The sub-questions require qualitative data from the literature and, most importantly, stakeholders from the case study. It is important here that multiple stakeholders are involved.

3.4 Analysis tools

The literature will be analyzed, to create a clear view of the existing field of academic research and lacking information. The tools used for assessing the result of the interviews will be qualitative content analysis. One analysis tool that will be used for this study is Atlas.ti, which allows users to find, code/tag, annotate, and locate characteristics within unstructured data sets. Adding to that, it also has visualization capabilities (ATLAS.ti Scientific Software Development GmbH, 2023). With the help of Atlas.ti, qualitative insights of the interviews can be obtained and frequently occurring topics and concepts will be analyzed. In that way, the results of the interviews will be compared. As already mentioned, the interviews are all semi-structured and all follow the same topics, as the case selection criteria allow us to do so. Because of that, the results can be analyzed in this manner with the help of Atlas.ti. The most important concepts in the results will be highlighted and the results will be thoroughly assessed by summarizing and making conclusions on the interviews. Comparing the results to the existing literature from publications and other desk research is crucial to understanding the implications of the interviews. While the interviews delve into the same topics, it is important to note that there are two types of interviews conducted in this research. The first type is the identification of problems for pharmaceutical companies. The questions asked in these interviews are similar and follow the same main topics. For the other interviews, the focus is put more on the collective action framework and the perspective of supplier companies within the pharmaceutical sector.

3.5 Coding with Atlas.ti

As mentioned above, the interviews can be divided into two groups, with interviews 1 through 4 delving into issues of pharmaceutical companies and with interviews 5 through 7 delving into collective action concepts for suppliers of pharmaceutical companies. Because of this slight change in questioning, the results of these interviews will be analyzed separately. In this way, patterns that will be identified will carry actual meaning as reoccurring themes follow from the same line of questioning.

Atlas.ti enables us to link code to pieces of texts within the interviews. This allows us to see what themes reoccur in the different interviews. The provided code is grouped, and important themes are assessed. Next, important code is added, and themes of this research are implemented. The results of the coding with Atlas.ti will thus provide relevant insights into the current issues for pharmaceutical companies and suppliers. The results will reveal the most reoccurring themes within the interviews that relate to the current issues within the pharmaceutical industry. Table 12 in appendix D shows what codes have been implemented in the transcriptions of the interviews.

4 Descriptive Analysis Johnson & Johnson

To understand the implication of the collective action theorem within the pharmaceutical industry, it is important to fully capture the image of our case-study. This chapter elaborates on the description of Johnson & Johnson given in the introduction and provides insights into the main operations of the company and the organizational structure. Johnson & Johnson is a multinational corporation that operates in the healthcare industry. Founded in 1886, the company has grown to become one of the largest and most well-known pharmaceuticals, consumer packaged goods, and medical devices companies in the world. This chapter provides a descriptive analysis of Johnson & Johnson by delving into hot topics and relevant business characteristics of the company. Most of the information in this chapter was retrieved from Johnson & Johnson's own resources.

4.1 Company analysis

As Johnson & Johnson is one of the largest healthcare companies in the world, it offers a wide variety of goods that are used in several healthcare business sectors. Consumer health, pharmaceuticals, and medical devices are the three divisions in which Johnson & Johnson specializes. Popular products including Listerine, Johnson's Baby, and Band-Aid are included in the Consumer Health sector. Figure 3 gives an overview of all the subsidiaries that are owned by Johnson & Johnson. The pharmaceutical industry focuses on the development of prescription medications as well as on therapeutic research in fields including neuroscience, oncology, and immunology. The Medical Devices section manufactures a comprehensive range of medical devices and surgical tools. Figure 3 gives a clear overview of this and what brands all fall under the Johnson & Johnson banner.

Figure 3: Brands owned by Johnson & Johnson (The Shocking Size of Johnson & Johnson, 2020)

Johnson & Johnson operates in more than 60 nations as one of the largest pharmaceutical companies in the world. They have the ability to reach a lot of consumers due to multiple reasons. The company's manufacturing facilities, research facilities, and sales offices are very beneficial for them as it gives them a large advantage over other competitors in the market. Johnson & Johnson puts a lot of emphasis on quality, and they aim to maintain strong brand recognition. Through decades of producing products, the company has gained a good reputation. Their focus on innovation and safety has led to their significant growth over time and it has led to their market dominance over their various businesses.

Johnson & Johnson is known for its focus on Research and Development (R&D). The company is committed to delivering top-tier products that address unmet medical requirements, aiming to resolve challenges and heighten patient well-being. Their R&D undertakings frequently encompass collaborative endeavors with educational establishments, healthcare entities, and allied associates. Johnson & Johnson is actively involved in enlisting suppliers for ecologically conscious initiatives, fostering a collective commitment to environmental responsibility. Collaborating with parties like the Global Community Impact organization, Johnson & Johnson actively pursue climate objectives. These types of initiatives serve as a framework for their aspirations, encompassing global health betterment, ecological footprint reduction, and the advancement of inclusivity and diversity.

4.2 Climate engagement of JnJ

Johnson & Johnson is very open about their climate progress and shares its approach to climate action as well as progress and current project in their Health for Humanity Report (Johnson & Johnson, 2022). They believe in the importance of transparent reporting and open up their climate impact data. They also present performance data and the progress for every environmental objective that they have set in the Environmental Health section of their report. The ESG performance data posted by Johnson & Johnson in 2021 shows that they have made a lot of progress toward their emission targets. Figure 4 shows the trajectory that their performance has taken over the last couple of years.

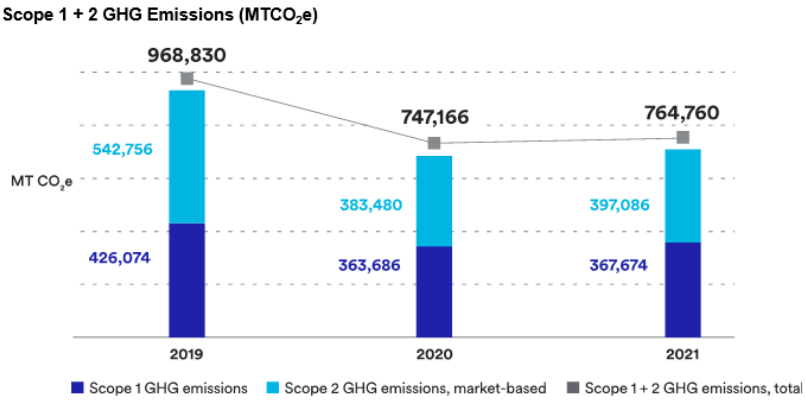

Figure 4: Johnson & Johnson's scope 1 and 2 emission progress ("ESG Performance Data," 2022)

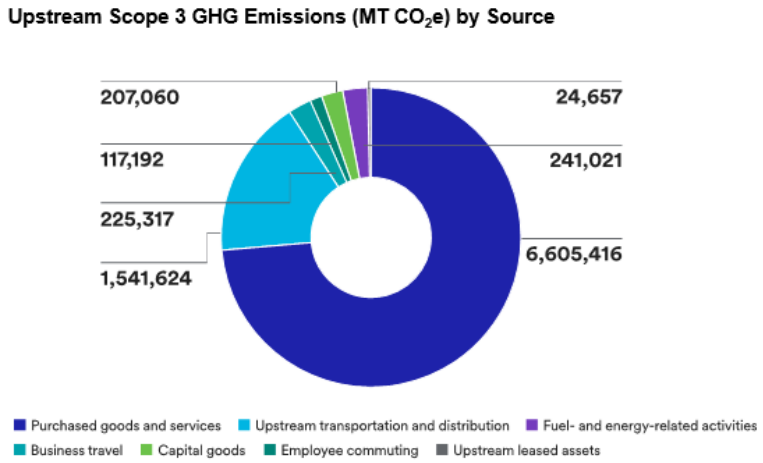

Figure 5: Johnson & Johnson's scope 3 emissions ("ESG Performance Data," 2022)

Important to note from this data shown in figure 4 and 5, is that the scope 3 emissions remain significantly larger than the scope 1 and 2 emissions combined. A lot of the scope 3 emissions come from purchased goods and services. To reduce these emissions, they will have to stimulate those companies that they purchase from to engage in climate activities.

4.3 JnJ's company performance

Johnson & Johnson is subject to regulatory issues and scrutiny, just like many other big pharmaceutical and healthcare organizations. The business, for example has already dealt with legal problems and product recalls, which have hurt its standing and bottom line. Johnson & Johnson, however, has taken action to resolve these issues and improve its compliance procedures.

Historically, Johnson & Johnson has performed well financially. The broad range of products and services that they offer contributes significantly to their revenue and generation of profit. The company's financial stability and large size bring many benefits as well. For example, they can make smart acquisitions, reinvest in R&D, and provide dividends and share repurchases to their shareholders. Figure 6 shows the scale of Johnson & Johnson's business operations in terms of yearly sales numbers.

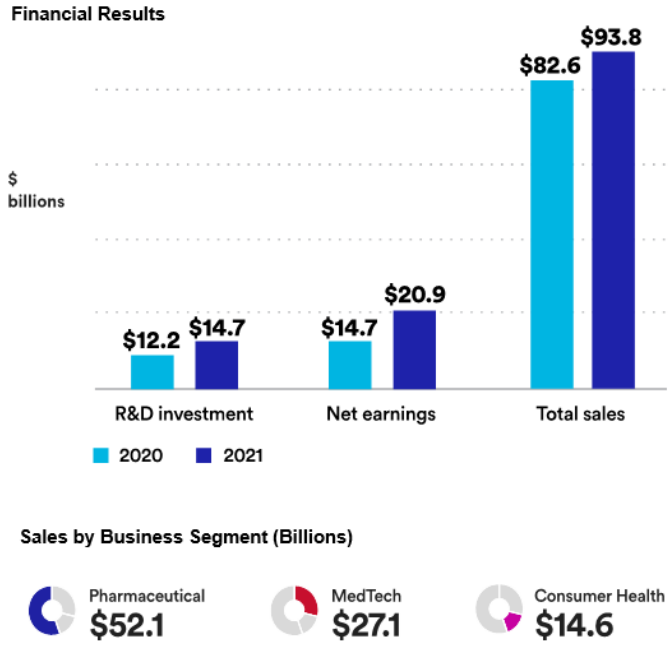

Figure 6: Johnson & Johnson's financial result of 2021 ("ESG Performance Data," 2022)

Overall, Johnson & Johnson is a well-known pharmaceutical corporation with a wide range of products, a solid brand reputation, and they are dedicated to social responsibility and innovation. Their long-lasting success has led them to grow significantly over time and they lead the pharmaceutical field in various aspects, business-wise, as well as sustainability-wise.

4.4 Janssen Pharmaceutical Company

In the context of this study's focus on pharmaceutical enterprises like Johnson & Johnson, a detailed examination of Janssen is done. Since 2010, the entirety of Johnson & Johnson's pharmaceutical divisions has adopted the name Janssen. As a part of Johnson & Johnson, the Janssen Pharmaceutical subsidiaries operate within a hierarchical organizational framework, characterized by distinct management tiers and specialized functional units.

The upper echelon of Janssen Pharmaceuticals' organizational hierarchy is occupied by the corporate level. This tier encompasses Johnson & Johnson's senior leadership cohort and board of directors. Charged with supervisory responsibilities, decision-making authority, and strategic guidance, this tier exercises oversight over the entire conglomerate, including Janssen Pharmaceuticals.

Facilitating the operational effectiveness of Janssen Pharmaceuticals is its Leadership Team. Comprised of senior executives, this Leadership Team assumes the mantle of steering and supervising the company's global operations. They control and manage Janssen and stand atop the subsidiary company.

Their occupation is over multiple domains such as research and development, production, sales, marketing, and other mission-critical functions.

Within Janssen Pharmaceuticals, a constellation of functional departments contributes to the enterprise's multifaceted functions. Each department is uniquely attuned to a distinct expertise. The core departments of Janssen that are crucial for its business operations are as follows (Janssen Nederland, 2022):

- The Research and Development (R&D) sector carries the responsibility of uncovering new pharmaceutical innovations, orchestrating and executing clinical investigations, and ensuring stringent regulatory compliance.
- The Manufacturing and Operations arm assumes control over the production cycle, supply chain oversight, and widespread dissemination of Janssen's pharmaceutical portfolio.
- Focused on amplifying market reach, the Sales and Marketing division aims to improve awareness and facilitate the sale of Janssen's products to medical professionals, pharmacies, and hospitals. Crafting strategic marketing blueprints, nurturing client relationships, and orchestrating sales campaigns comprise their core undertakings.
- Regulatory Affairs functions as the guardian of adherence to mandates stipulated by national health authorities. This division shoulders the responsibility of navigating Janssen's product registration, securing approvals, and maintaining perpetual compliance.
- Entrusted with upholding the efficacy and safety of Janssen's merchandise, the Quality Assurance and Control unit upholds and enforces exacting benchmarks across the entire production continuum.
- The financial management, budgetary orchestration, comprehensive reporting, and sundry fiscal activities are under the control of Janssen Pharmaceuticals' Finance and Accounting department.
- Human Resources oversees the workforce management. Tasked with recruitment, employee relations, skill refinement initiatives, and human resource functions, this sector oversees the company's human capital strategy.

Janssen Pharmaceuticals boasts a global presence, spanning multiple international regions and countries. Within each of these regions or nations, there exist dedicated regional or national entities. These entities are responsible for tailoring and executing the company's strategies in alignment with local regulations and market-specific prerequisites. This hierarchical framework empowers Janssen Pharmaceuticals to adeptly manage its operational facets, forge innovative pharmaceutical breakthroughs, ensure regulatory adherence, and propagate its offerings on the global stage. In the context of this study, our primary focus is directed toward the Dutch and Belgian subsidiaries under the umbrella of Johnson & Johnson. Table 4 provides a comprehensive overview of the current subsidiaries situated within these designated countries, duly categorizing them based on their specific domains. For this research however, we mainly focus on the pharmaceutical branches of Johnson & Johnson that are located within the Netherlands or Belgium.

Table 4: The Dutch and Belgian subsidiaries of Johnson & Johnson

	Pharmaceuticals	Consumer	Medical Devices
Netherlands	Janssen Biologics B.V., Leiden	Johnson & Johnson Consumer B.V., Amersfoort	Johnson & Johnson Medical B.V., Amersfoort
	Janssen Vaccines en Prevention Center, Leiden		
	Janssen-Cilag, Tilburg/Breda		
Belgium	Janssen Pharmaceutica NV, Beerse	Johnson & Johnson Consumer NV,	Johnson & Johnson Medical NV,
	Janssen Pharmaceutica NV, Geel		
	Janssen-Cilag NV		

4.5 Johnson & Johnson's sectorial impact

Next to focusing heavily on their scope 1 and 2 emissions, Johnson & Johnson has also put a lot of emphasis on their scope 3 targets. These latter targets have a great implication for their business processes if they want to achieve them. In their Health for Humanity Report they elaborate on how important collaboration with their suppliers is for achieving their emission targets (*Johnson & Johnson*, 2022). During their supplier-selection process, Johnson & Johnson takes environmental responsibility into account. They elaborate on various requirements that they set for suppliers, such as having emission reduction goals, implementing programs to limit climate impact on multiple fronts, and having mechanisms in place that allows them to measure emissions and climate impact (*Responsibility Standards for Suppliers*, 2022). Johnson & Johnson expects suppliers to align with expanded requirements concerning emission reductions, as well as contribution by measuring and publicly disclosing data; increased focus on energy efficiencies; and integration of biodiversity considerations, recyclability and recycled material use (*Supplier Engagement - Johnson & Johnson Health for Humanity Report*, 2022). Furthermore, they report on the progress of their supplier sustainability program. Johnson & Johnson states that 42,800 of their suppliers, which is 93% of their total, are included in one of the three Health for Humanity 2025 goals (*Responsible Supply Base - Johnson & Johnson Health for Humanity Report*, 2022). So while Johnson & Johnson has put a lot of effort on their own emission reduction, they have also been busy stimulating and engaging suppliers to do the same.

4.6 Stakeholder environment

This section identifies the most important stakeholders that are important for achieving the climate targets of JnJ. Table 5 gives an overview of these stakeholders and their interests and if they influence the problem situation directly or indirectly. The Dutch VIG focusses on developing medicine for patients and aims to stimulate innovations within the sector (Vereniging Innovatieve Geneesmiddelen, 2023). Pharma.be is the Belgium organization that focusses on the same topics in general (pharma.be, 2023). These branch organizations have similar goals and aim to engage companies in innovative projects and improve healthcare for all. It is important to take all these stakeholders in consideration for the analysis, to understand the impact and importance of engagement of all parties.

Table 5: Stakeholder interests

Stakeholder	Description of involvement	Interest	Role
Johnson & Johnson	JnJ aims to reduce CO2 emissions across its value chain and sets ambitious targets for all companies under their banner.	Reducing CO2 emissions	Direct
Rijksoverheid (NL) & federale overheid (B)	The government bodies within the Netherlands and Belgium aim to stimulate sustainability activities and reduce nationwide climate impact.	Reducing climate impact	Indirect
Supplier companies	Supplier companies are crucial for achieving climate targets across value chains.	Reduce climate impact	Direct
Pharmaceutical companies	All pharmaceutical companies are involved in emission reduction projects, alltough levels of ambitions and targets may vary.	Achieve climate targets	Direct
European Commission	The European Comission has set targets for European companies to achieve certain levels of sustainability and emission reductions	Policy making	Indirect
VIG (NL) & pharma.be (B)	These branche organisations represent the pharmaceutical companies in their respective companies and have similar interests.	Collaborate to support companies	Direct

4.7 Main points descriptive analysis

The descriptive analysis teaches us that Johnson & Johnson and consequently Janssen Pharmaceutical has put a lot of emphasis on their environmental impact, as well as their societal impact. The company has operations in a large number of countries and they focus on various market segments. The top-down corporate control has led to clear and effective regulations and climate activities. Johnson & Johnson has set institutions in place for their subsidiary companies to effectively tackle local climate challenges and for each separate site, analyses are made to optimize the potential emission reduction and other climate targets. Scope emissions will require the most attention in the future, as the data shows. They are motivated to engage suppliers and other companies in emission reduction projects. The stakeholder landscape shows that there are multiple parties involved that could all potentially contribute to collective action initiatives and stimulate sector-wide emissions reduction efforts.

5 Analysis & results

This chapter elaborates on the results of the literature research, the interviews and coding. It provides an analysis of the Johnson & Johnson case within the pharmaceutical sector, and it explores the challenges that the pharmaceutical sector faces with implementing climate targets. 5.1 aims to explore the approach of Johnson & Johnson, based on the descriptive analysis and the interviews, while 5.2 delves into the challenges coexisting with climate targets for Johnson & Johnson, as well as for other pharmaceutical companies and suppliers. 5.3 discusses collective action initiatives. All these discussions are based upon the earlier literature research and the interviews. Then 5.4 dives into the occurrence of the collective action framework concepts and shows the significance of the results from the Atlas.ti coding.

5.1 Johnson & Johnson's approach

One important aspect of Johnson & Johnson's approach is that they try and set targets early on, as a representative from Johnson & Johnson (referred to as interviewee A) mentioned in the interview (appendix B.1). This helps create a clear view of the issues to tackle and helps with developing policies and strategies. As a representative from Janssen Pharmaceutical Benelux (also referred to as interviewee D) mentioned, Johnson & Johnson has an Office of Sustainability, which is responsible for communicating ideas and developing a strategic vision for sustainability within J&J (appendix B.3). This group of 30-35 experts is a rather small department for a company that has around 135.000 employees. They focus on the pharmaceutical sector, supplier companies and customers to identify sustainability challenges from a scientific standpoint. They develop a strategic vision based on their analysis and ensure that the company's approach to climate action is well substantiated. In an interview with two representatives from Janssen Pharmaceuticals Benelux, interviewee B and C discuss hot topics concerning the local approach of the company (appendix B.2). Interviewee B also mentioned that there is a general manager board within the Netherlands that focusses on the ambitions of the company nation-wide. This ensures that the company has a unified strategy and that issues are targeted effectively.

The Janssen Pharmaceutical companies within the Netherlands and Belgium follow corporate ''external'' climate targets, but also try to go beyond that. Interviewee D mentioned that the company has internal and external targets. The Benelux subsidiaries go beyond the corporate targets in that way and have a reputation for being ambitious and motivated to achieve climate targets. This is possible because of the national environment, but also stimulated by customer pressure in some way. Interviewee A confirmed that the regulations and coherent costs of climate action initiatives in some countries are less favorable for the company. Since Johnson & Johnson has such a large variety of subsidiaries spread across the globe, there are a lot of differences in national regulations. This is why, for example, in Belgium and the Netherlands, the subsidiaries can be more ambitious.

Adding to this, interviewee A acknowledged the challenges of climate regulations in different countries. Subsidiary companies of Johnson & Johnson work together to some extent to tackle climate issues. Some activities are sharing best practices, piloting, having regular meetings, and avoiding duplication of efforts. By engaging in these kinds of activities, the subsidiary companies can help other subsidiaries a lot and benefit from the collaboration themselves. Interviewee D also referred to collaboration between subsidiaries and discussed the sharing of best practices and the opportunities of employees to engage in company projects. Johnson & Johnson provides opportunities to join We Sustain teams which are initiatives where people can contribute to sustainability projects and share ideas with others from other subsidiaries internationally. This provides even more opportunities for companies like Janssen

Pharmaceuticals to engage in sustainability projects and to learn from others who might have similar experiences. There is also a Planet Council in place, which is meant to connect subsidiaries and sites and stimulate collaboration, interviewee B adds. The company thus enables its subsidiaries to collaborate and share best practices to reduce emissions and learn from each other on various topics.

5.1.1 Tackling scope 1 and 2 emissions

The scope 1 and 2 emissions of a company a considerably easier to control for companies than scope 3 emissions since they come directly or indirectly from company processes and activities. For Johnson & Johnson, tackling these emissions are therefore significantly easier than for the scope 3 emissions. Some activities that the Dutch and Belgium site are engaging in are electrification, using green power, geothermal energy, etcetera. Interviewee D also mentions that they make investments in green electricity production, such as the wind farm in the North Sea. As discussed in the descriptive analysis, Johnson & Johnson is making good progress on these targets and is expected to achieve them by 2030. This is partly due to the company's power purchase agreements (PPA's). Interviewee A mentions that they are close to meeting these goals, primarily through strong PPA's for renewable energy in Europe and the US. Interviewee B, C and D also mention the importance and effectiveness of the PPA's.

As already discussed, the Dutch and Belgium Janssen Pharmaceutical subsidiaries are ambitious with achieving climate targets and reducing emissions. In an interview with two representatives from the Dutch Janssen Pharmaceuticals company (referred to as interviewee B and C), they explain that while they are ambitious, they can only go so far. That is because corporate control is leading for them, which is why they avoid getting ahead of oneself and try to avoid conflict. Getting too much ahead of the targets can mean that they spend a lot of time, effort and even funds into development of sustainable practices, which could clash with the wishes of corporate. Corporate wishes to distribute resources among it's subsidiaries and wants to prevent lost efforts for projects that might be too ambitious. With that being said, corporate policies and strategies are what motivate the ambitions of subsidiaries to contribute and achieve even better climate results. Interviewees B and C continue this topic by explaining that corporate analyses the different subsidiaries and assesses at what sites most progress can be made on the sustainability front. So while some subsidiaries may set higher internal targets, corporate actively assesses them and develops sustainability targets for each subsidiary depending on their situation and opportunities.

5.1.2 Tackling scope 3 emissions

The biggest challenge for Johnson & Johnson, as well as for countless other MNE's, remains the reduction of scope 3 emissions. The scope 3 emissions are all the emissions that are paired with all activities from assets that are neither owned nor controlled by the organization. Reducing these emissions requires engagement of suppliers and companies with which they collaborate and exchange products or services. A large part of Johnson & Johnson's emissions come from scope 3 processes, meaning engagement from third parties is crucial for the company's targets. As interviewee A said in the first interview, scope 3 emissions entail almost 90 % of the company's entire emissions. Interviewee B and C also explained that reducing the scope 1 and 2 emissions are achievable in the set timeframe, but that after that is completed the scope 3 emissions will remain. Achieving the company's 2045 ambitions therefore means that the focus will shift to the scope 3 emissions which means that a lot of work needs to be done on that front. Adding to this, interviewee C emphasized the importance of engaging suppliers and enabling them to contribute to reducing emissions across the value chain. Eventually large companies can say that they will only procure for low emitting suppliers, but the

supplier companies will in the end still need help with reducing emissions and attaining net zero themselves. Not all suppliers have the means to do this, and collaboration is therefore very important. Collaborating with suppliers is a good way to reduce scope three emissions, and the need for supplier engagement is therefore crucial. This chapter will elaborate on this topic and how initiatives could help Johnson & Johnson tackle the scope 3 emission targets.

5.2 Challenges within the pharmaceutical industry

The introduction and literature review indicated that there are various challenges that are yet to be tackled to reduce greenhouse gas emissions in the pharmaceutical sector. Large MNE's tend to have ambitious targets, like Johnson & Johnson for example. However, they cannot achieve these targets by themselves. The global initiative needs to translate to a sector-wide approach, where suppliers are also engaged in climate action. The interviews aimed to explain current challenges for pharmaceutical challenges, as well as for supplier companies, to understand what obstacles hinder climate action.

5.2.1 Technological challenges for the pharmaceutical sector

One major challenge for the pharmaceutical industry is the lack of new technologies. Interviewee A and B highlighted this issue both by emphasizing that for their operations, they are dependent on new innovations to cut emissions. In an interview with a representative (referred to as interviewee E) from a supplier company (appendix B.4), the importance of better and more effective techniques to speed up their business procedures was highlighted. Currently it takes a lot of time and effort, and new developments could make their business more effective, which in turn could lead to less climate impact. Interviewee A also mentioned that for their scope 1 and 2 emission reduction, thermal heat is a big topic. Pharmaceutical products are made using really high thermal heat, and there's no easy, renewable substitution. They are hoping for hydrogen boilers, and that some of these new technologies come into place to help reduce company emissions.

There are also various technological constraints that companies have to deal with. Transitioning to more sustainable energy as a company can be hindered by infrastructural issues including electricity networks and technological constraints limits of the electrical grid, as highlighted by interviewee B and H. Interviewee H represents a company that also supplies other companies, and they are highly involved in the pharmaceutical sector (appendix B.7). This lack of capacity is thus an issue that can occur for all companies across the supply chain, as the interviews indicate. Interviewee D adds to this topic by explaining that Johnson & Johnson is focussed on finding suitable sites for renewable energy projects, overcoming technical obstacles in implementing sustainable solutions, and raising awareness and employee involvement. This issue is however not that easy to tackle, since changing electrical grids and improving capacities can demand a lot of costs and effort.

5.2.2 Data challenges for the pharmaceutical sector

Another hot topic within the pharmaceutical industry is data sharing. Interviewee A explained that there is a lack of accurate emissions data from suppliers. Johnson & Johnson wants accurate data in order to assess their carbon footprint and understand where emissions need to be tackled. Suppliers often have their scope 1 and 2 emission data in order and measured nicely, but their scope 3 emissions are difficult to assess. This is a challenge for Johnson & Johnson, as they need to have specific and accurate data for their own climate impact analysis. In an interview with a representative from another supplier company, which will be referred to as interviewee F, we also discuss this topic (appendix B.5). Interviewee F adds

that customers may need information from other suppliers within the pharmaceutical sector, where there are other items, to accurately evaluate their own carbon footprint. It is emphasized that these customer initiatives are voluntary and that suppliers are subject to higher requirements. Interviewee F also argues that the supply chain should share information in a similar way to how safety data sheets do to better understand the key impact areas and advance the entire sector.

Interviewee H discussed similar challenges within the pharmaceutical sector and emphasized that data sharing and consistency for enhanced decision-making is a big issue for the sector. Collaboration and data consistency are specifically mentioned as areas that need emphasis. Especially for smaller businesses, the present fragmentation of data providers and solutions adds complexity and makes it challenging to manage sustainability reporting and decision-making. To make data collection easier and give businesses along the supply chain a clear and understandable framework, more consolidation and collaboration are desired.

5.2.3 Sector wide reoccurring challenges

Next to the lack of new innovations and data consistency and sharing, there are other highly relevant issues. For example, interviewee A explained that the pharmaceutical sector has a lot of regulations, compared to other sectors such as apparel and consumer goods sector. Designing and developing products takes a lot of time, which is why they set targets early on, as discussed in the approach of Johnson & Johnson. One challenge that requires sector-wide attention is recycling high valued medical devices. As explained by interviewee A, regulations in different countries leaves Johnson & Johnson no option but to export high value medical devices to the UK from other European countries. This makes recycling complicated and a larger process than it needs to be.

There are also countless differences between subsidiary companies of Janssen Pharmaceuticals. They must therefore consider the different conditions and environments that sites find themselves in. Interviewee B and C explain that the numerous organizations and locations in the Netherlands present difficulties because of their various suppliers, procedures, and goals. So as a company tries to implement a companywide strategy, they must consider differences of subsidiaries on various aspects. Furthermore, interviewee F points out that companies across different nations may have different levels of openness to cooperation and participation since some companies prioritize lowering emissions within their own borders while others may believe that investing in emission reduction abroad will have a bigger impact. Adding to this, interviewee D, explained that customer pressure does influence engagement of companies in different countries. In some regions, awareness and demand for sustainability are still developing which leads to a smaller rate of engagement by companies.

The biggest challenge, however, remains the reduction of scope 3 emissions. This was already highlighted by Johnson & Johnson's approach and their focus on scope 3 emissions. Interviewee D highlighted the challenges of reducing scope 3 emissions and explained that purchasing raw materials is a major part of this, but so are logistics processes, clinical studies and packaging. Confirming this, interviewee H explains that process enhancements in the production of pharmaceuticals and environmentally friendly packaging are areas of attention. Interviewee F added to this topic by explaining that reducing emissions produced upstream and downstream in the supply chain is a big topic for their company. Interviewee E speaks of the opportunity for cooperation with vendors and other pharmaceutical businesses to increase the sustainability of the entire supply chain. Companies are looking to reduce emissions across the supply chain, but they can't do it by themselves. The interviews highlight that scope 3 emission reduction is a difficult topic and tackling this will require a lot of action from different companies. This active approach from a lot of companies is still missing, which is why

companies such as Johnson & Johnson aim to engage other companies in climate actions projects. Other companies often lack the funds or pressure to significantly reduce carbon emissions.

5.3 Collective action initiatives

The interviews conducted for this research also delved into hot topics of emission reduction initiatives within the pharmaceutical sector. The interviews provided insights into these projects and opportunities for sector companies, as well as outside suppliers to contribute to emission reduction targets. One important thing to note is that the will of companies to share information or practices with other companies is highly dependent on what kind of matter it concerns. If it concerns a competitive matter, companies will not just share their knowledge, since it could very possibly lead to a loss for the company. Interviewee D emphasized this by saying that JnJ shares knowledge about non-competitive matters with companies in the same sector if possible. Interviewee D said: "But there's also and a lot of those sustainability themes are in what we call it a non-competitive, those are things where we don't get any advantage as a company to do that alone. We just benefit from doing that together. Bringing sustainable packaging for pharmaceutical products to the market is good for the entire pharmaceutical industry. Reducing our CO2 emissions and those of our suppliers, that is good for the entire sector and, so you often see those non-competitive topics that we tackle together." Companies always prioritize their own business operations and will therefore not share information and best practices on competitive matters. According to interviewee D, the cooperation mechanisms that are currently in place are mainly between the suppliers of various raw materials, packaging companies and the large pharmaceutical companies. The global nonprofit for environmental impact disclosures, formerly Carbon Disclosure Project (CDP), score companies and institutions on their environmental performance and disclosure. The project facilitates organizations with disclosing their environmental impact data. Clear and transparent data is important for effectively tackling climate challenges and it can help companies identify where scope 3 emissions are hard to tackle, as discussed above in the ‘’Data’’ subsection.

5.3.1 Existing projects within the pharmaceutical sector

Currently there are various projects ongoing and in development that support the industry with tackling emission reduction challenges. One interesting project is the energize program. Energize is a program, created improve access to renewable energy for pharmaceutical supply chains (*Introducing Energize – Increasing Access to Renewables for Pharma Supply Chains*, 2021). Interviewee A talked about this program and their role in the process: ‘’ So what we're trying to do is, you know, do some industry level collaborations to try to roll up numbers like through the supply chain so that we can take emissions data from our suppliers, have it be accurate, verified, and have it flow into our own emissions data so that as our suppliers, through programs like energize, which we start in the pharmaceutical industry, which we're pushing renewable energy opportunities, and helping our suppliers go into the market, as well to purchase PPAs’’. Energize enables smaller companies to contribute to reducing emissions and tackle climate issues. The program aims to help supplier companies within the pharmaceutical sector with educational and functional support. Interviewee H explains that their company also participates in Schneider Electric's Energize program, as well as Manufacturer 2030, which both seek to increase the usage of renewable electricity in the supply chain and increase supplier sustainability activities. As discussed in the descriptive analysis, Johnson & Johnson reports on their supplier sustainability program, as they try to engage more suppliers to achieve emission targets. Supplier engagement is crucial to them and monitoring that progress is therefore important for their own sustainability reports.

Adding to this, the company of interviewee F understands how crucial it is for data to be transparent and clear to guarantee suppliers keep their promises. There is a big need within the industry for consistent data reporting. During the interviews, it became clear that one challenge is data consistency. Interviewee F discussed this and explained that with the help of EcoVadis scores, a lot of companies try to report consistently and transparently. EcoVadis scores are awarded to companies based on their sustainability activities (Verhoef, 2023). It focusses heavily on emissions and helps create a clear image of a company's overall sustainability efforts. A lot of companies have their own methodologies for measuring emissions and climate impact, but for larger companies to analyze the combined emissions from their entire supply chain, clear and consistent data is crucial.

A similar project is the Together for Sustainability (TfS) initiative. The difference here however, is that the TfS focusses on onsite inspections instead of reporting and document analysis, as EcoVadis does. TfS supports chemical companies with improving their corporate social responsibility and stimulates them to be more sustainable. Interviewee F explained their company's connection to the Together for Sustainability initiatiave, as well as the World Business Council for Sustainable Development (WBCSD). The WBCSD is a worldwide initiative for the business sector that supports sustainable developments and it links stakeholders and helps them develop a shared vision on future sustainability goals (*World Business Council for Sustainable Development*, 2023). Interviewee H explained that they work along with groups like the Sustainable Healthcare Coalition and Pistoia Alliance to model and reduce the carbon footprint of decentralized clinical trials, a complex area encompassing several institutions and doctor's offices. The Sustainable Healthcare Coalition is led by pharmaceutical companies and it focusses on opportunities to improve sustainable practices in the industry through the collaboration of participants (*Sustainable Healthcare Coalition*, 2022). The Pistoia alliance is a project for Life Science topics that aims to lower the barriers for pharmaceutical companies to innovate in Life Sciences. Their framework enables involved companies to collaborate with others and innovate on prominent issues. These programs are hot topics within the pharmaceutical sector and for companies aiming to reduce their scope 3 emissions, these programs help engaging suppliers with climate action.

There is also the Renewable Thermal Collaborative, a network tackling the problem of decarbonizing high-temperature processes like sterilization and concentrating on renewable heat solutions. Interviewee H explains that they are engaged in this program and aim to reduce emissions with the help of this network. The Renewable Thermal Collaborative is not a sector specific initiative, but it enables companies to collaborate and innovate to cut emissions and be more sustainable (Renewable Thermal Collaborative, 2023).

5.3.2 Institutions existing to tackle recent challenges

There are also some institutions in place that aim to help companies set and achieve climate targets. Interviewee B and C explained that J&J is a participant in a group working on sustainability and is a member of de Vereniging van Innovatieve Geneesmiddelen (VIG). The VIG is a Dutch branch organization for the pharmaceutical sector and the members focus on developing innovative pharmaceutical products. It is a collaborative project that seeks to connect Dutch companies and stimulate innovation for the benefit of society. Better collaboration means better healthcare and the VIG aims to stimulate this. The Belgian FPA is also a sector organization with positions on sustainability themes and how problems should be tackled sector-wide. Interviewee D discussed this and their involvement with the Belgian FPA. Janssen Pharmaceuticals aims to collaborate with other companies where possible to reduce emissions and stimulate innovations.

Looking outside of Johnson & Johnson, the interview with a representative from another pharmaceutical company gives us insights into how comparable organizations tackle emission reduction challenges. Interviewee E explained that for their company, there is a Dutch "country council" that promotes communication across the various sites in relation to collaboration within the company. They exchange expertise and data about sustainability-related efforts. For a company which has multiple sites within the Netherlands with varying business operations that focus on different sub-sectors, collaboration is still maintained. By working together and sharing experiences between subsidiary companies, the company of interviewee E is actively improving their sustainability activities.

5.3.3 Supplier engagement

As mentioned in the interviews with Johnson & Johnson and Janssen Pharmaceuticals, supplier engagement is crucial for reaching their scope 3 emission targets. Without engaged and contributing suppliers, their emission targets are impossible to achieve. Supplier companies know this as they also work wit suppliers which they have to consider when measuring their climate impact. The entire value chain is involved in the climate impact and interviewee F noted that they indeed also require their suppliers to contribute to sustainability targets. The corporation of interviewee F establishes minimal requirements for their suppliers and promotes improvement by soliciting solutions from those that fall short of the acceptable benchmark. Also, interviewee H emphasized the importance of stakeholder, supplier, and customer engagement. Their company puts a lot of focus on engaging multiple parties and aims to have suppliers contributing to climate targets. Interviewee F notes that by giving suppliers access to methodology, consulting connections, and best practices, the company pushes them to assess and lower their own carbon footprints. To ensure comparability and encourage collaboration on emissions reduction, the company wants industry-wide standardized approaches.

5.3.4 Sharing between companies

Next to initiatives, companies can also engage in information sharing with other companies. Sometimes conferences can be held to bring together various parties and stimulate information sharing on important climate challenges. For example, interviewee B and C mentioned plans to host a conference that brings together various healthcare ecosystem participants, such as pharmaceutical firms, medical facilities, insurance providers, and patient organizations. In areas including CO2 reduction, circularity, education, and illness prevention, partnership in the interests of environmental and social sustainability is explored. Interviewee B finally emphasizes the need for collective action because one company within the sector cannot achieve their goals on their own. And as a small site, you need others even more. By collaborating, costs can be shared, and recycling can be significantly improved. A representative from a supplier company which will be referred to as interviewee G discussed hot topics and challenges for emission reduction within the pharmaceutical sector. Interviewee G mentioned the existence of conferences on energy conservation held by the local government. Adding to this, interviewee G said that the company is actively looking for ways to work with other businesses, talking about upcoming projects, scheduled maintenance breaks, and potential synergies. They may discover areas for development and reach their sustainability goals by exchanging experiences and best practices. An employee of Janssen Pharmaceuticals also discussed this topic and mentioned that the different teams do share best practices within the company, even internationally. Also, interviewee E mentioned that at their pharmaceutical company, they also facilitate international communication and knowledge sharing. For these large companies, it seems beneficial to share knowledge and best practices, in order to avoid making the same mistakes where it is not necessary.

Companies can also work together with others in the case that they can both profit from the collaboration or have a collaboration that is convenient for both parties. For example, interviewee G mentioned that they work together with a nearby waste incinerator to create steam by utilizing the waste heat from their activities. Through this partnership, the company uses less natural gas and yearly saves about 16 million cubic meters of natural gas. This partnership is convenient and saves a lot of gas for the company. Interviewee G also discussed that working together with nearby businesses is essential for resource pooling and attaining shared objectives. They collaborate on tasks like energy monitoring, high-voltage stations, and steam supply. The corporations hold regular meetings and keep lines of communication open to discuss strategies, schedule maintenance shutdowns, and guarantee the dependability of utilities. While certain information is disclosed, others, including precise production information or potential business transactions, require confidentiality. Interviewee H talked about the importance of joint work on renewable thermal solutions within the sector. Collaborative efforts are desired to improve innovation and to share best practices so that companies can improve their environmental impact and reduce emissions. Adding to this, while corresponding with another supplier company that produces chemicals, they claim that the most prominent measures for them currently are sending parcels together, having shipments collected together for different customers, and an office that is as climate neutral as possible that was recently built with solar panels and a geothermal heat pump. This is, however, a relatively smaller company than the other supplier company, so it is important to note that their topics of focus can differ from other, larger suppliers.

In the conversation with interviewee G, the dynamic nature of sustainability initiatives, where teamwork, consumer demands, and regulatory requirements drive continual progress is emphasized. To maintain its position at the forefront of sustainability practices, the company recognizes the necessity of adapting and learning from other businesses, both inside and outside of their industry. Johnson & Johnson is also motivated to engage suppliers and other sector companies and acknowledges the importance of collective action. Interviewee D explained that sustainability is increasingly recognized as an important aspect of business success and that J&J has seen their sustainability initiatives yield positive results. Interviewee D cites examples of cost savings through energy efficiency, improved employee engagement and growing market demand for sustainable products. Interviewee D also emphasizes the importance of transparent communication and reporting on sustainability performance to maintain stakeholder trust and enhance J&J's reputation.

5.4 Occurrence analysis interviews

The interviews were coded as described in the methodology, to find reoccurring themes in the interviews. For the interviews with interviewee A, B, C, and D, topics on climate challenges and the current state of the pharmaceutical sector were discussed. The code shows that the topics of Company characteristics, challenges for emission reductions, sustainability, and company management were heavily mentioned. The interviews with interviewee E, F, and G delved into the collective action framework. They were questioned about what challenges hinder collective action initiatives and what their views are on improving engagement in collective action initiatives.

The results of the coding are shown in tables 6 and 7. The frequency of mentioned topics is shown per interview and a pattern of reoccurring themes can be concluded. Table 6 indicates the frequency of occurrence of the coded topics in all the interviews in total. Table 7 shows a more detailed result as it shows the re-occurrence of the topics in each interview. It is important to note that there were two differently constructed interviews, as mentioned above. This results in a different pattern of topics for

the two types of interviews. The first three columns represent the results of the interviews with the supplier companies, and the last 4 columns represent the pharmaceutical company interviews.

Table 6: reoccurrence of coded topics in the interviews

	Totals
Challenges for emission reduction	32
Collective initiatives	9
Company characteristics	99
Face-to-face communication	2
Freedom to enter or exit	0
Heterogeneity	5
Information about pas actions	0
Levels of cooperation	44
Linkage structure	14
Management activities	70
Net benefits	4
Number of participants	2
Reciprocity	2
Reputation	2
Subtractive or shared resources	4
Sustainability	90
Trust	5
Totals	384

Table 7: Results Atlas.ti coding

		1: H 29	2: G 28	3: F 23	4: A 27	5: B & C 34	6: D 26	7: E 39	Totals
Challenges for emission reduction	32	10	10	6	3	3			32
Collective initiatives	9	3	2	1		2		1	9
Company characteristics	99	6	15	9	16	17	14	22	99
Face-to-face communication	2		2						2
Freedom to enter or exit	0								0
Heterogeneity	5	3	1	1					5
Information about pas actions	0								0
Levels of cooperation	44	4	12	9		6	7	6	44
Linkage structure	14	9	2	3					14
Management activities	70	2	6	4	11	13	15	19	70
Net benefits	4	1	1	2					4
Number of participants	2	2							2
Reciprocity	2		1	1					2
Reputation	2			1			1		2
Subtractive or shared resources	4	2	1	1					4
Sustainability	90	9	7	13	10	16	16	19	90
Trust	5	1	3	1					5
Totals		52	63	52	40	57	53	67	384

Based on this table, we can make Sankey diagrams to visualize the frequency of topics discussed in the interviews. Since the two different types of interviews focussed on the two separate sets of topics, only these frequently mentioned topics are considered in the Sankey diagrams. Figure 7 shows the Sankey diagram for the supplier interviews with focus on the collective action concepts and figure 8 shows the Sankey diagram for the interviews with the pharmaceutical companies and the more general topics that delved into current sector challenges.

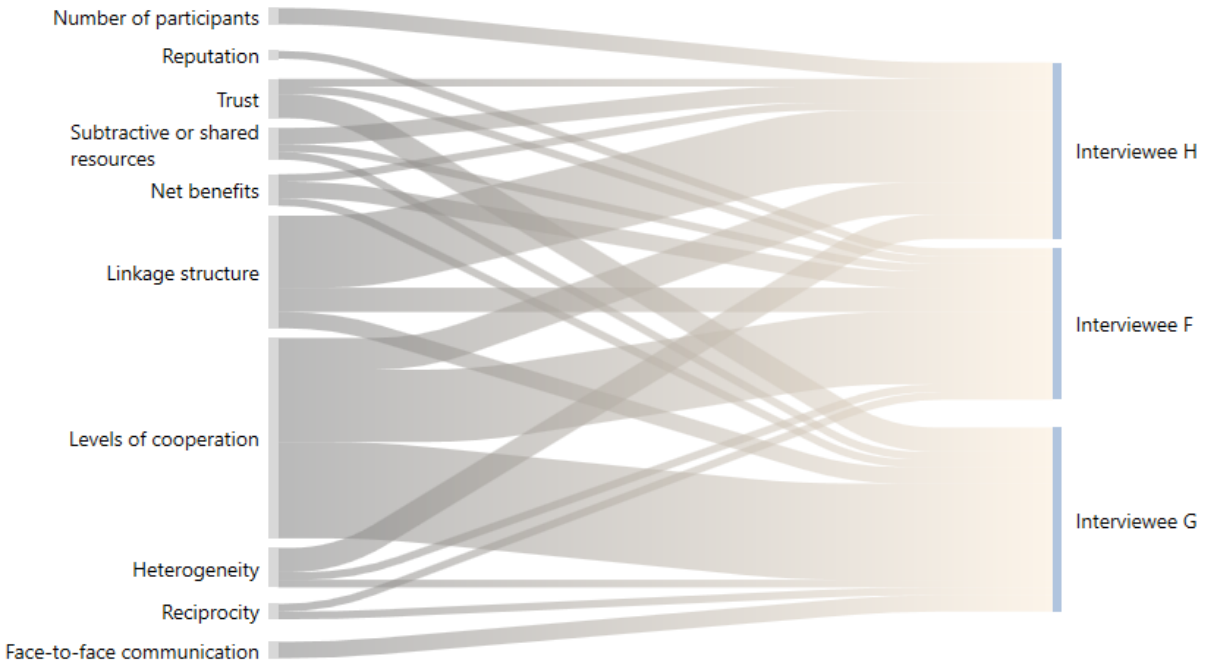

Figure 7: Sankey diagram suppliers

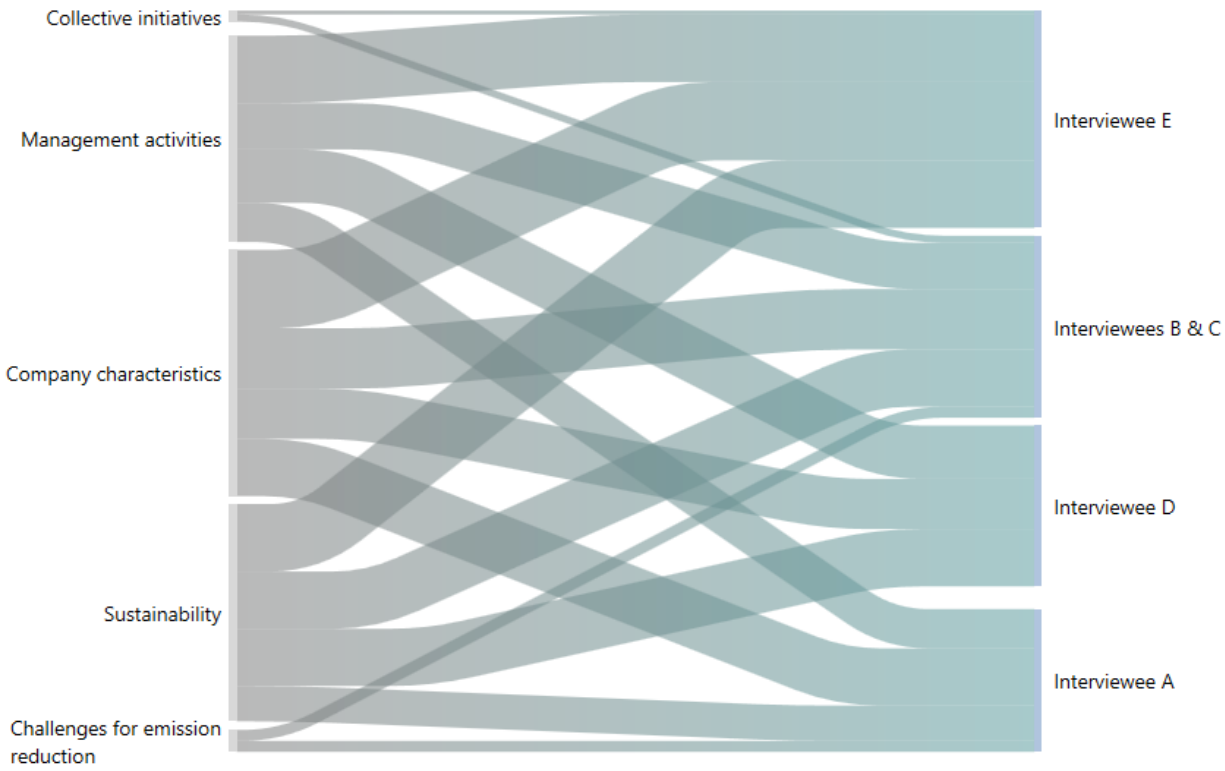

Figure 8: Sankey diagram pharmaceutical companies

The co-occurrence analysis shows the co-occurrence of the different kinds of topics in the interviews. The relation of collective action topics with the other frequently occurring topics is shown in table 8. Especially the levels of cooperation is reoccurring very frequently, which makes sense since it is a central part of the collective action framework and it is an important point of discussion in the pharmaceutical sector. The literature already taught us that achieving emission targets is a cooperation problem, which explains why this topic stands central in all the interviews.

Table 8: Co-occurrence analysis

		Challenges f... 32	Collective in... 9	Company c... 99	Manageme... 70	Sustainability 90
Face-to-face communication	2			1	1	
Freedom to enter or exit	0					
Heterogeneity	5	4	1	2		4
Information about pas actions	0					
Levels of cooperation	44	8	5	27	24	25
Linkage structure	14	8	4	7	3	9
Net benefits	4	4		3	1	2
Number of participants	2	1	1	1		1
Reciprocity	2	2		2		1
Reputation	2	1		2	2	2
Subtractive or shared resources	4	3		2		1
Trust	5	1		3	2	1

These results show the frequency and the co-occurrence of important topics in the interviews. It can be seen what concepts were mentioned most often and in what interviews collective action topics were more re-occurring. The results show a significant difference in the interviews with the pharmaceutical companies and the supplier companies, which can be explained by the fact that the interviews were structured in a different way, as discussed in the methodology. The patterns that come forth in this analysis show that supplier companies most frequently discussed the implications of linkage structure, division of net benefits, shared or subtractive resources, heterogeneity, and trust. The significance of these results will be elaborated upon in the next chapter.

6 Interpretation & discussion

The results from the last chapter show the most prevalent challenges for Johnson & Johnson, as well as for suppliers, and they also revealed the most reoccurring themes discussed in the interviews. This chapter analyzes those results and assesses what they mean in the collective action framework. Each main concept from the collective action framework is discussed and the emphasis of the interviews is explored. Since this research is limited to a total of 8 interviewees, it is important to note that the results of the coding might not exactly correspond with the reality. If more interviews had been done, other topics could be mentioned, and certain aspects of the collective action framework could be highlighted. With that being sad, the results of the last chapter show a similar theme in all interviews. This indicates that the interviewees pointed mostly towards the same topics.

6.1 The importance of collective action concepts for engagement of supplier companies

6.1.1 Shared or subtractive resources

The origin of resources for a collective action are very important since it determines whether a good is public or common pool. As established earlier on in this report, companies tend to work together more often on non-competitive matters, as it averts complexities and has potential to result in positive benefits for every party involved. This research focusses specifically on opportunities for collaboration of shared resources. As the interviews indicated, competition hinders the engagement of parties and prevents them from contributing to collective action, as it could damage the company's business value. In the interviews with the supplier companies, this topic was mentioned multiple times, and the interviewees indicated that engagement in collective action initiatives is dependent on whether the resources that are shared are competitive or not. Interviewee H pointed out that while collaboration is sometimes beneficial for multiple parties, if one company loses value they will not cooperate. Business is business. It was a topic that was mentioned in all supplier interviewees, though not extensively, and the main line was about the same, as interviewee H discussed.

6.1.2 Linkage structure

The significance of linkage structure of collective action initiatives also came forward in the interviews, and then specifically only in the interviews with the representatives of the supplier companies. This makes sense because these interviews delved into collective action and important factors that companies consider when entering initiatives. The interviewees indicated that the existing institutions and government regulations are very important for the result and impact of collective action initiatives. The government has a lot of influence on collaborative action, and they can provide crucial motivations and means for companies to participate. The interviewees indicated that the current structures that are in place could be improved to stimulate emission reduction activities over the supply chain. Linkage structure also points to how companies collaborate and how they are connected in a collective action. In the case of the pharmaceutical sector, often a small group of companies starts a collective action initiative, like Energize, and other companies can participate and benefit from it. In this way, all companies benefit from expertise and overall improvement of emission reduction activities.

6.1.3 Information about past actions

While information about past actions could be relevant for companies when deciding to join a collective action, the interviewees did not discuss the importance of this factor. This variable obviously ties in with reputation and trust and it can thus be assumed that this variable is expressed in those other variables. A reason why this variable wasn't mentioned specifically could be because the collaborations that this research point towards are more sector-wide and involve a lot of participants. With a lot of possible participants, it is unrealistic to have information about all these companies' past actions and you could question how important that is if there are clear agreements made between involved companies. In short, this variable could in reality be a note-worthy factor, but the interviews in this study did not discuss the importance of the variable, which could be due to multiple reasons.

6.1.4 Number of participants

The interviews pointed towards a relation between number of participants and the willingness to cooperate in collective action initiatives. For instance, interviewee H mentioned that collaboration efforts are also impacted by participant numbers. The more parties decide to join an initiative, the more fruitful it can be. Sharing more best practices and having more insights from different perspectives can help the initiative be more useful and productive. Interviewee G also explained that while a bigger number of involved participants can be beneficial, more importantly can be that there is a shared understanding of the problem and the way that it should be tackled.

However, the inclusion of a large number of participants can also cause a delay in the rolling out of a project. By having to consider the wishes and requirements of various companies, processes can be slowed down which is often unwishful for all the parties involved. Interviewee G also noted that the number of participants is not the main dependent in collective action. If there is a will and companies with the required measures are involve, an initiative can be facilitated.

6.1.5 Heterogeneity

Adding to the relevancy of number of participants for collective action initiatives, interviewee H discussed that collaboration efforts are also impacted by participant diversity. Heterogeneity makes a collaboration more diverse and complete in the sense that more (types of) companies from across the value chain contribute. The interviews emphasized that in order to achieve 2030 emission targets, engagement and contribution from suppliers is crucial. By engaging various types of companies that are supplier in the value chain for Johnson & Johnson, emission reduction challenges can be tackled more effectively. Data sharing standards can be made consistent and sharing of best practices on climate activities can shared between various involved companies. The interviews pointed towards a positive relation between heterogeneity and cooperation, which makes sense since pharmaceutical companies have a lot of suppliers that they are dependent on for reducing scope 3 emissions. By having your supply chain reduce emissions and be consistent in data reporting, big pharmaceutical companies such as Johnson & Johnson can achieve their climate targets more effectively.

6.1.6 Freedom to enter or exit

As for the variable information about past action, this variable also wasn't discussed in the interviews. The interviewees did not point towards the importance of the freedom to enter or exit, which could be due to multiple reasons, comparable to the information about past actions. Adding to this, the freedom to enter or exit was not mentioned partly due to the fact that the interviews did not dive into specific

collective action initiatives. Also, in order for companies in the pharmaceutical sector to join certain initiatives, they will have to uphold the standards and agreements of that collaboration. Engagement thus means that they will contribute to the initiative and the freedom to enter or exit is not explicitly discussed in the interviews. In reality, this could be an important factor of course. Yet, pharmaceutical companies and suppliers feel more and more pressure from governments and stakeholders to achieve more ambitious climate targets and entering collective action initiatives that help them achieve these targets is therefore beneficial for them. They might not worry about the freedom to enter or exit that much since the benefit of participating likely outweighs the possible costs for a company. In short, the interviews did not point towards the importance of the freedom to enter or exit, but it could in reality be something that companies take into consideration to a certain level, because they have to consier possible damages and costs.

6.1.7 Trust

The interviews with the supplier companies inquired also about the trust and reputation between companies that work together on sustainability projects. In general, the interviewees said the trust is good, but they operate more based on strong agreements and company name. Interviewee H explained that there is a high level of trust between the businesses that they work closely with, and staff are familiar with one another's operations and uphold a cooperative environment. However, this relationship is somewhat of an outlier, since this concerns companies that work closely together compared to companies who engage in sustainability initiatives. It is emphasized by interviewee G that large companies do not solely act on trust, but rather contracts and agreements that are set in detail. Interviewee H added that although a "trust but verify" attitude is frequently used, trust between companies is regarded as crucial.

6.1.8 Reputation

As mentioned above, the interviews also inquired about reputation between companies in the context of entering collective action initiatives. Just like with trust, reputation is not everything when looking at motivations of companies to join initiatives. Interviewee D discussed how J&J deals with stakeholder and customer pressures at the regional level, as well as the challenges and impact of sustainability efforts on business performance and reputation. Interviewee F affirmed that collaborations are influenced by a company's reputation for sustainability and emissions reduction. Companies that have a good reputation in these fields are more inclined to work together, but those that don't put any effort into sustainability may encounter resistance from potential partners. The interviews indicated that reputation is important and that it does in fact affect the willingness to collaborate.

6.1.9 Reciprocity

Cooperation is dependent on the level of reciprocity between actors. Participants of a collective action need to be put in a position where they can give, as well as receive from others. Parties are dependent on each other to help achieve climate targets, as mentioned earlier. A collective action needs to be fruitful and help participants achieve better climate performance. Participants can be motivated by receiving knowledge and information about best practices, since it spares them from investing by themselves on topics that are already being tackled by others. Interviewee H explained that in a collaboration with another company to reduce emissions, both parties recognize their reliance on each other and work to keep their relationships positive while identifying win-win solutions. Companies are often reliant on

others in collective action initiatives and need each other to reach benefits, whether this is sustainability performance-wise or incentive-wise. Collaboration can lead to effective climate action situations and participating can thus save time and effort, as well as help reach climate targets.

6.1.10 Net benefits

The division of net benefits from a collective action initiative is very important for motivating companies to participate. Companies don't invest time and money in programs that aren't fruitful for their own, results are almost always needed. Interviewee H explained that business imperatives and returns on investment are key factors in motivating corporate cooperation and investment. As much as companies care about climate action, in order for them to engage in emission reduction collaborations, the corresponding benefits need to be clear. If engaging does not lead to emission reduction in their supply chain or does not provide other incentives, it is less likely that they will participate. In collaborations, the distribution of benefits can be argued over. If some companies help other companies out by providing them with recycling options or help them with processing raw materials in a more sustainable way, they are also entitled to some of these benefits. Interviewee F elaborated by saying that there are continuous discussions about distributing benefits and credits for lowering emissions from certain processes or utilizing CO2 that has been captured. Companies need each other for these kinds of projects and therefore need to make agreements on who can claim the benefits.

6.1.11 Levels of cooperation

The level of cooperation of companies is dependent on all mentioned factors in this analysis, directly and indirectly. Trust and reciprocity are two main drivers of cooperation and thus engagement of companies to collective action initiatives. Interviewee G explained that successful collaboration requires trust and cooperation, and even while disagreements may occur, the companies work to find solutions and provide support for one another. The division of net benefits also seems to be highly important for the engagement of companies, as discussed above. The interviews indicated that a clear positive effect and a fair distribution of net benefits from the collaboration is crucial for cooperation. They also indicated that while companies look at trust and reputation, they prioritize agreements and contracts for entering collective action initiatives.

Another important factor that influences cooperation is public awareness. Interviewee D explained that in some regions, awareness and demand for sustainability are still developing which leads to a smaller rate of engagement by companies. Public consensus is thus very important for the motivation of companies to engage in collective efforts.

6.2 Co-occurrence of codes

As this discussion suggests, certain concepts from the collective action framework seem to be of more significance to supplier companies than other concepts. To try and understand why this is the case, we look at the specific codes where these 'important' concepts were mentioned in the interviews. By doing so, we could try see to what topics these concepts were linked to and how these concepts are important to the interviewees.

The most frequently recurring concepts according to the coding analysis were levels of cooperation, linkage structure, subtractive or shared resources, the division of net benefits, heterogeneity, and trust. The concept ''levels of cooperation'' stands central in this research since it indicates a company's

willingness to collaborate. Therefore, this concept was mentioned frequently in all interviews. The other concepts, however, were only mentioned in the supplier interviews. Table 9 shows the co-occurrence of these concepts with the important topics that were discussed in the interviews. It can be seen that the concept ‘’levels of cooperation’’ is frequently linked to topics such as company characteristics, management activities and sustainability. This is partly because the factor ‘’levels of cooperation’’ was discussed in all interviews, as it signals collaborative efforts. But it is also because it stands central in the collective action framework. Therefore, we look at how often it was linked to the concepts of the collective action framework in total. Table 10 gives an overview of how often the concept ‘’levels of cooperation’’ was mentioned in the same code as other collective action concepts. From that table we can conclude that linkage structure and trust were most frequently mentioned within the same pieces of code as levels of cooperation. Next to that, net benefits and shared or subtractive resources were also mentioned multiple times in the same sentences as levels of cooperation.

Table 9: Co-occurrence of most reoccurring concepts of the collective action framework

	Challenges for emission reduction 32	Collective initiatives 9	Company characteristics 99	Levels of cooperation 44	Management activities 70	Sustainability 90
Heterogeneity 5	4	1	2	1		4
Levels of cooperation 44	8	5	27		24	25
Linkage structure 14	8	4	7	7	3	9
Net benefits 4	4		3	3	1	2
Subtractive or shared resources 4	3		2	3		1
Trust 5	1		3	5	2	1

Table 10: Co-occurrence of collective action concepts and ‘’levels of cooperation’’

	Levels of cooperation 44
Face-to-face communication 2	2
Freedom to enter or exit 0	
Heterogeneity 5	1
Information about pas actions 0	
Linkage structure 14	7
Net benefits 4	3
Number of participants 2	1
Reciprocity 2	1
Reputation 2	1
Subtractive or shared resources 4	3
Trust 5	5

But how are these concepts linked in the code? It is important to understand in what sense these codes co-occurred. We therefore provide some examples from the coded interviews to help understand the significance of the co-occurrence of important concepts.

One example of a piece of coded interview that included the factors: ‘’levels of cooperation’’ and ‘’linkage structure is:

‘’… Um, so what's the expectation in terms of, you know, if a company like ****supplier company**** *invests in this, what is our return like? Obviously, you know, we're at the end of day, we're a business. We can't*

just go ahead and invest in a billion different things because right now it's a spider web of different directions. And if we don't have any guarantee that that's going to, you know, result in a better relationship, a sale, then it's very hard for us to do that investment. …''

Here, the interviewee was asked about the challenges for companies within the healthcare sector to collaborate in initiatives. The answer indicated the importance of linkage structure and how companies are tied to benefits of a project. The benefits are very important for these kinds of companies and the linkage structure needs to assure that, otherwise there will be a low level of cooperation.

Another example of a piece of coded interview delves into the topics ''trust'' and ''levels of cooperation'':

''… So I think there's always going to be that trust but verify situation, particularly when it comes to carbon, because it is it's not easy. It is very difficult. It's easy to talk. It's very hard to actually put the investment in. So I think that's just what we're going to see as an expectation from a kind of a customer-supplier relationship all all the way down the chain. …''

Trust is talked about multiple times in the interviews and this example shows in what context it is mentioned. The significance of the concept is thus to be questioned, as the times that it is mentioned, the interviewees do not claim that it is a highly important factor, as they see linkage structure.

6.3 Discussion on results and established literature

The most reoccurring collective action concepts in the interviews that were linked to levels of cooperation were the linkage structures that are in place, the division of net benefits of a collective action, whether it concerns shared or subtractive resources, and the trust between companies that are involved. The results of the coding showed that these topics were most reoccurring. While these topics were mentioned most often, the way they were discussed is also important to note, as shown with the examples of the coded interviews above. With that being said, we now look back at the literature review done at the beginning of this research to see if the findings correspond with the literature.

To recall the literature review, current research indicated that the factors trust, linkage structure, and net benefits are the most important factors for actors to decide to cooperate in collective action. This can vary since collective action projects can be varied in size and in form. However, it is interesting to see how this corresponds to this research. The results of the coding of the interviews showed that the linkage structures that are in place, the division of net benefits of a collective action, the heterogeneity of companies involved, and the trust between companies that are involved are the most important factors for supplier companies. This thus corresponds with the literature, as trust, linkage structure, and net benefits were also highlighted in other research. Adding to this, shared or subtractive resources is also linked to cooperation in the interviews, which is interesting. It seems that companies value whether it concerns shared or subtractive resources of as well to some degree, which is something that the literature did not specifically indicate to be one of the most important factors.

7. Conclusions

In this chapter, we discuss the main results of this study and answer the research questions that this thesis posed. Next, the limitations and recommendations for future research are provided. The main purpose of this research was to explore the current issues with tackling emission reduction within the pharmaceutical industry. To understand the current landscape, we focussed on Johnson & Johnson, one of the largest pharmaceutical companies in the world who put a lot of emphasis on sustainability.

7.1 Main results

To answer the research questions and sub questions, a literature review and interviews where done. The results of the interviews were analyzed and summarized and used for coding with Atlas.ti. The coding was used to identify reoccurring themes in the interviews. The literature review and the interview assessment provided insights into current issues for pharmaceutical companies as well as for supplier companies. The various sources often pointed towards the same types of issues, for example scope 3 emissions are often a large part of the total amount of emissions and for large companies this is difficult to tackle since a lot of parties are involved. The descriptive analysis on Johnson & Johnson showed how their company is structured and how they tackle companywide issues. The coding also pointed towards the importance of certain factors, that were identified with the use of the collective action framework by Ostrom (2009). The interviewees indicated that in order for collective action initiatives or collaborations to come into fruition, factors such as division of net benefits, linkage structure, shared or subtractive resources, and trust are considered to a certain degree. Table 7 shows the overview of topics mentioned in the interviews, and table 10 shows the relation of important collective action concepts to levels of cooperation in the interviews. This indicated what the interviewees consider important when looking to engage in collective action initiatives.

7.2 Research findings

[1] What is the organizational structure of Johnson & Johnson and what are the characteristics of the subsidiaries?

To understand the current challenges with reducing CO2 emissions for multinational pharmaceutical companies, it is important to understand the landscape in which they operate and how they operate themselves. Johnson & Johnson has many subsidiaries which could make managing sustainability targets a challenge. The descriptive analysis delved into the company structure and managing activities. Johnson & Johnson has a decentralized organizational structure, giving freedom to some extent to its subsidiary companies. However, climate targets are set top-down all the way through the organization, meaning they are non-negotiable. Johnson & Johnson has subsidiaries in a lot of countries and within multiple sectors, such as medical devices, pharmaceuticals, and consumer branches.

[2] What are the plans of Johnson & Johnson for achieving the emission goals and how is this communicated?

Johnson & Johnson has committed to the SBTi 2030 targets and aims to achieve their ambitious climate targets. They aim to source 100% of their electricity needs from renewable sources by 2025, achieve carbon neutrality for our operations, going beyond our Science-Based Target to reduce absolute Scope 1 and 2 emissions 60% from 2016 levels, and reduce absolute upstream value chain (Scope 3) emissions 20% from 2016 levels by 2030 (Johnson & Johnson, 2022). Johnson & Johnson is on track to achieve their scope 1 and 2 emission goals, as can be derived from their ESG performance data. However, tackling scope 3 emissions remains a challenge. Johnson & Johnson communicates company-wide targets top-down and the company also provides opportunities for subsidiary companies to exchange ideas.

The Dutch and Belgium subsidiaries that are part of Janssen pharmaceuticals are also well on their way for achieving the emission targets. For reducing their scope 1 and 2 emissions they are taking various actions, with their focus being on electrification, using green power, geothermal energy, etcetera. Interviewee D also mentioned that they make investments in green electricity production, such as the wind farm in the North Sea. As discussed in the descriptive analysis, Johnson & Johnson is making good progress on these targets and is expected to achieve them by 2030. This is partly due to the company's power purchase agreements (PPA's). Interviewee A mentions that they are close to meeting these goals, primarily through strong PPA's for renewable energy in Europe and the US. Interviewee B, C and D also mentioned the importance and effectiveness of the PPA's.

[3] What are current initiatives within the pharmaceutical sector that have a positive effect on emission reduction, that Johnson & Johnson is involved with?

As discussed in the analysis, there are various initiatives that aim to help companies become more sustainable. There are collaborations between companies that allows companies to be more sustainable together, by sharing processes or helping each other recycle products better. There are institutions in place that aim to help pharmaceutical companies be more sustainable and that help them innovate more, namely the Dutch VIG and the Belgium pharma.be. And then there are also initiatives from the pharmaceutical sector that aim to support companies to be more sustainable and improve sustainability reporting. Energize for example, in which Johnson & Johnson is heavily involved, aims to increase access for suppliers to renewable energy. Also, data consistency within the supply chain is still lacking, according to the interviews. Ecovadis provides scores for companies that indicate the level of sustainability activities from a company. This helps large pharmaceutical companies choose the most sustainable suppliers and decrease their scope 3 emissions in turn. Other projects that came to order in the interviews were the Together for Sustainability, the Renewable Thermal Collective, the World Business Council for Sustainable Development (WBCSD), the Sustainable Healthcare Coalition, and the Carbon Disclosure project. These projects mostly focus on engaging suppliers and stimulating collaborations between companies to reduce emissions.

[4] What are the challenges that Johnson & Johnson faces with the implementation and coordination of the emissions goals set by the main corporation?

Chapter 5 provided an elaborate explanation of the topics discussed in the interviews and what challenges are most prevalent for Johnosn & Johnson and the pharmaceutical sector at this moment. First, there are quite a few technological challenges that companies are hindered by. New technologies can help speed up business processes and enable companies to work more sustainable and efficient. Companies are also hindered by infrastructural issues including electricity networks and technological

constraints limits of the electrical grid. Technological development and new expertise are needed for companies to operate on a more sustainable level and achieve climate targets more effectively. Second, data reporting across the supply chain is not consistent enough. Smaller supplier companies often don't have the methods or personnel to keep up with the wishes of larger pharmaceutical companies that desire accurate data reporting. Most important of all is that pharmaceutical companies have to put a lot of focus on reducing scope 3 emissions, as that will be more challenging than reducing scope 1 and 2 emissions, where they have more control over. As discussed, Johnson & Johnson is on pace to reach their 2030 scope 1 and 2 emission goals. But as they have ambitions to reach 100% net zero emissions in the future, they will have to further reduce their scope 3 emissions. Supplier engagement is therefore crucial and projects that stimulate engagement are important for reaching net-zero emissions in the future. Interviewee A also emphasized this and discussed that scope 3 emissions will need a lot of attention in the future.

[5] How can challenges be addressed from a collective action standpoint across the value-chain by Johnson & Johnson?

To understand how challenges can be addressed most effectively, it is important to know what factors hinder the engagement of companies within the pharmaceutical sector in collective action initiatives. The coding with Atlas.ti revealed the most reoccurring themes with regard to the collective action framework. Table 7 above shows the frequency of concepts mentioned in the interviews. The most important thing for pharmaceutical companies is to engage suppliers. For suppliers, the most reoccurring themes in the interviews were linkage structure, subtractive or shared resources, the division of net benefits, and trust. These factors were heavily linked to levels of cooperation, which stood central in the interviews. For pharmaceutical companies to stimulate supplier companies, they could focus on these factors and see how they can engage suppliers more effectively. This is however not entirely in the hands of pharmaceutical companies, but it does provide insight into what factors are important for supplier companies to engage in collective action initiatives that help reduce emissions across the value chain. In short, the challenge of reducing scope 3 emissions for Johnson & Johnson can best be addressed by focusing on the factors that supplier companies consider when entering collective action initiatives. This brings us to the main research question.

How can Johnson & Johnson improve their collaborative efforts to reduce emissions and satisfy their 2030 emission targets?

The sub questions provided insights into the current operation strategies and challenges of Johnson & Johnson. The company already puts a lot of emphasis on climate action and innovation. The main challenges for their future climate targets will be around reducing scope 3 emissions, which require supplier engagement. The interviews with supplier companies indicated that some factors are very important for them to consider before participating in collective action initiatives or collaborations. While it may be difficult to point towards specific actions for Johnson & Johnson and comparable pharmaceutical companies to improve collaborative efforts, some recommendations can be made based on the results of this research. When trying to engage suppliers in collective action projects or collaborations, they should focus on the factors that the suppliers find important. The most important factors for supplier companies are, as discussed in with the last sub question, the linkage structures that

are in place, the division of net benefits of a collective action, shared or subtractive resources, and the trust between companies that are involved. Companies seem to value the type of linkage structures that are in place, and how companies are linked to each other in a collective action. Also, the division of net benefits is important to them, which the literature also indicated. This means that companies value the structure and the agreements made between companies that decide where costs and benefits flow and who gets to profit most from a collaboration. Companies thus also tend to work together more often when the product is a public good instead of a common pool good, as it removes the competitiveness of companies. Pharmaceutical companies need suppliers to engage in collective projects so that data reporting can be more consistent and emission reduction activities of suppliers will increase. The efforts of supplier companies significantly help Johnson & Johnson with reaching their 2030 scope 3 emissions, which remains the biggest challenge of their climate targets.

There are, however, many other pharmaceutical companies that aim to reduce their CO2 emissions and achieve climate targets to attain carbon neutrality in the short future. With the active approach that Johnson & Johnson is taking, there are some lessons that could be drawn for other pharmaceutical companies, as well as for the pharmaceutical sector. These lessons include the conclusions drawn above. Johnson & Johnson has put a lot of effort into supplier and customer engagement and continues to develop new projects and ideas to tackle climate challenges, not only internally but also externally. Engaging other companies in climate activities is very important and pharmaceutical companies could aim to stimulate engagement by focusing on improving the above-mentioned significant concepts of the collective action framework to do so. Working together is crucial for achieving the climate targets in the future needed to limit rising global temperature to 1.5 °C.

7.3 Recommendations

Following these conclusions, we could provide suiting recommendations for Johnson & Johnson, as well as for other pharmaceutical companies. For example, companies should focus on developing and managing trust-based relationships with supplier companies. Implementing strategies that stimulate openness, reliability, and transparency are very important for developing trust with other companies. This could also be done by organizing meetings and implementing feedback mechanisms. By engaging all partner companies in these activities, trust will likely improve, and companies will be more willing to cooperate with one another.

Another recommendation that follows from the conclusions is that fair and transparent mechanisms for distributing net benefits are implemented. The benefits that a collaboration brings could be financial results, assets, or intellectual property. By fairly distributing these benefits, companies will be stimulated to engage in collective action initiatives more frequently, as the analysis suggests. By working towards an equitable division of net benefits and providing clear criteria for assessing and dividing net benefits, all parties involved will perceive the rewards of a collaboration in line with their contributions.

One last recommendation is that companies should try and optimize their linkage structure within their collaboration network, if possible. Sometimes companies don’t have enough influence to adjust linkage structures by themselves, but this study indicated the importance of linkage structures to companies within the pharmaceutical sector. Optimizing linkage structures could be done by identifying free riders and unwishful behavior in a collaboration. Engaging all participants is crucial so that all parties involved contribute and increase the value of a collective action.

7.4 Limitations

Firstly, it is important to note that this study was done in a limited timeframe with limited resources. Second, because companies have their business' value to protect, we can't investigate their business operations and strategies in detail. The interviews done in this research did therefore not go that deep into the companies' operations and strategies, but focused more on the general landscape of the pharmaceutical industry and climate challenges that are prevalent.

Third, this study was done with a limited amount of 8 interview correspondents, of which 4 worked for Johnson & Johnson and the other 4 were from other companies within the pharmaceutical sector and supplier companies that deliver various materials and products. The Johnson & Johnson interviews provided a good oversight of the company and how they operate in different parts of the organization. The other interviews gave insight from 4 different viewpoints, with one from another large pharmaceutical company, one packaging supplier company, one chemical supplier company, and one company that among other things supplies medical products and services. It is thus important to note that the number of interviewees is limited, however the results of the interviews were comparable in content and gave a similar pattern when coding with Atlas.ti. Also, the varying backgrounds of the interviewees provides a good insight into the current situation within the pharmaceutical sector.

7.5 Future research

The result of this research indicated that some collective action concepts were more heavily linked to levels of cooperation than others. Some concepts were barely mentioned by the interviewees and some not even once. While we now know what the interviewees found to be the most important concepts for determining whether to engage in collective action or not, the extent to which they consider these important factors is not totally clear. Further research could delve into this by having correspondents of supplier companies score the importance of collective action concepts with a short questionnaire. In that way, the significance of concepts could be identified more precisely.

As the most important factors of the collective action framework are now identified, the focus of further research could now shift to identifying what the impact of regulating these factors could be. What is the effect of improving trust on willingness to participate in collective action? Research could focus on comparing the effects of policies that aim to improve these factors from the collective action framework. This could be done by making questionnaires to identify the impact of these factors, for example. Also, questionnaires that provide different policies or incentives could be done, to help identify how companies could most effectively be stimulated to engage in collective action.

The interviews and literature indicated that scope 3 emissions remain a large challenge for the future. To limit global warming to 1.5 °C, supplier engagement is needed and consistent emission data reporting across the supply chain is required. Further research could be done on how consistent emission data reporting could be improved most effectively. Why are some companies lacking in this aspect and how could more consistent data reporting be realized? This is not a competitive matter and would benefit companies who are looking to reduce their emissions. Consistent data reporting across the supply chain will make it easier to identify which supplier companies produce the most greenhouse gas emissions, so that more focus on sustainable climate activities can be put on the right organizations. Companies looking to purchase goods or services could also better assess what companies to buy from, based on their sustainability and emission data. Some supplier companies provide products or services that bring little emissions, and others could produce significantly more than them. Producing chemicals and other materials can often bring large greenhouse gas emissions and focusing on the right companies can make tackling scope 3 emissions more effective.

References

5 ways multinationals can have a greater impact on the SDGs. (2022, 20 mei). World Economic Forum. https://www.weforum.org/agenda/2021/09/5-ways-multinational-corporations-can-have-greater-impact-on-the-sdgs-sustainable-development-goals-mncs/

A list companies. (2022). https://www.cdp.net/en/companies/companies-scores

Alessandro du Besse' - Tech Editor. (2018, September 20). *Sustainability in a multinational company: an Interview with Johnson & Johnson*. Impakter. https://impakter.com/sustainability-multinational-company-interview-johnson-johnson/

Ambitious corporate climate action. (2022). Science Based Targets. https://sciencebasedtargets.org/

ATLAS.ti Scientific Software Development GmbH. (2023, August 15). *ATLAS.ti | The #1 Software for Qualitative Data Analysis*. ATLAS.ti. https://atlasti.com/?x-clickref=1101lwXNHIb6

Bistline, J. E. (2021). Roadmaps to net-zero emissions systems: Emerging insights and modeling challenges. *Joule*, *5*(10), 2551–2563. https://doi.org/10.1016/j.joule.2021.09.012

Booth, A., Jager, A., Faulkner, S., Winchester, C., & Shaw, S. (2023). Pharmaceutical Company Targets and Strategies to Address Climate Change: Content Analysis of Public Reports from 20 Pharmaceutical Companies. *International Journal of Environmental Research and Public Health*, *20*(4), 3206. https://doi.org/10.3390/ijerph20043206

Comyns, B. (2018). Climate change reporting and multinational companies: Insights from institutional theory and international business. *Accounting Forum*, *42*(1), 65–77. https://doi.org/10.1016/j.accfor.2017.07.003

Creswell, J. W. (2009). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology*, *11*(1). https://doi.org/10.1186/1471-2288-11-100

DeMarrais, E., & Earle, T. (2017). Collective Action Theory and the Dynamics of Complex Societies. *Annual Review of Anthropology*, *46*(1), 183–201. https://doi.org/10.1146/annurev-anthro-102116-041409

Deutch, J. (2020). Is Net Zero Carbon 2050 Possible? *Joule*, *4*(11), 2237–2240. https://doi.org/10.1016/j.joule.2020.09.002

ESG performance data. (2022). [Dataset; Excel]. In *Environmental health*. Johnson & Johnson. https://healthforhumanityreport.jnj.com/2022/

eTOPSign. (2022, 19 oktober). Collaborate with Non-Competitors and win - eTOPSign - Medium. *Medium*. https://medium.com/@walid_31242/collaborate-with-non-competitors-and-win-b413494cb03a

FAQs - Science Based Targets. (z.d.). Science Based Targets. https://sciencebasedtargets.org/faqs#what-are-the-emissions-scopes-which-scopes-do-targets-have-to-cover

Feiock, R. C. (2013). The Institutional Collective Action Framework. *Policy Studies Journal*, *41*(3), 397–425. https://doi.org/10.1111/psj.12023

Feiock, R., Carr, J., Johnson, L. S., & Benton, E. (2000). Institutional Choice and local Governance: a collective action framework for boundary change. *ResearchGate*. https://www.researchgate.net/publication/228423496_Institutional_Choice_and_Local_Governance_A_Collective_Action_Framework_for_Boundary_Change

Four Layer Model of Institutions. (n.d.). TU Delft OpenResearch.net. https://tudelft.openresearch.net/page/15863/four-layer-model-of-institutions

Francis, A. (2021, 28 juni). *Case Study: Johnson & Johnson Company Analysis*. MBA Knowledge Base. https://www.mbaknol.com/business-analysis/case-study-johnson-johnson-company-analysis/

Franco, S. (2021). The influence of the external and internal environments of multinational enterprises on the sustainability commitment of their subsidiaries: A cluster analysis. *Journal of Cleaner Production*, *297*, 126654. https://doi.org/10.1016/j.jclepro.2021.126654

Harring, N., Jagers, S. C., & Löfgren, Å. (2021). COVID-19: large-scale collective action, government intervention, and the importance of trust. *World Development*, *138*, 105236. https://doi.org/10.1016/j.worlddev.2020.105236

Hill, R. P., Stephens, D., & Smith, I. (n.d.). Corporate Social Responsibility: An Examination of Individual Firm Behavior. *Business and Society Review*, *108*, 339–364. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=437523

Iazzolino, G., & Bozzo, R. (2022). Partnership Models for R &D in the Pharmaceutical Industry. In *Springer eBooks* (pp. 29–48). https://doi.org/10.1007/978-3-031-11814-2_3

Immink, H., Louw, R., Garlick, A., Vosper, S., & Brent, A. (2021). Country specific low carbon commitments versus equitable and practical company specific decarbonisation targets. *Environment, Development and Sustainability*, *24*(8), 10005–10025. https://doi.org/10.1007/s10668-021-01854-7

Introducing Energize – increasing access to renewables for pharma supply chains. (2021). Introducing Energize – Increasing Access to Renewables for Pharma Supply Chains. https://perspectives.se.com/blog-stream/introducing-energize-pharma-supply-chains-letter

Janssen Nederland. (2022). Janssen Nederland. https://www.janssen.com/netherlands/nl

Jebb, A. T., Parrigon, S., & Woo, S. E. (2017). Exploratory data analysis as a foundation of inductive research. *Human Resource Management Review*, *27*(2), 265–276. https://doi.org/10.1016/j.hrmr.2016.08.003

Johnson & Johnson - Organizational Structure. (2020). https://www.bartleby.com/essay/Johnson-Johnson-Organizational-Structure-F34A2JNBJ

Johnson & Johnson. (2022). *Health for Humanity Report 2022*. https://healthforhumanityreport.jnj.com/2022/

Johnson and Johnson. (2022). Content Lab U.S. https://www.jnj.com/environmental-sustainability/climate-and-energy-action

Kim, S. Y., Swann, W. C., Weible, C. M., Bolognesi, T., Krause, R. M., Park, A., Tang, T., Maletsky, K., & Feiock, R. C. (2020). Updating the Institutional Collective Action Framework. *Policy Studies Journal*, *50*(1), 9–34. https://doi.org/10.1111/psj.12392

Lindgreen, A., & Swaen, V. (2010). Corporate Social Responsibility. *International Journal of Management Reviews*, *12*(1), 1–7. https://doi.org/10.1111/j.1468-2370.2009.00277.x

Liou, R., & Rao-Nicholson, R. (2020). Multinational enterprises and Sustainable Development Goals: A foreign subsidiary perspective on tackling wicked problems. *Journal of International Business Policy*, *4*(1), 136–151. https://doi.org/10.1057/s42214-020-00080-8

López, L. A., Arce, G., & Osorio, P. (2023). Foreign multinationals affiliates and countries' carbon upstreamness. How could these firms support the fulfilment of emissions reduction targets? *Journal of Environmental Management*, *326*, 116714. https://doi.org/10.1016/j.jenvman.2022.116714

Maina, P. W. (2021). Challenges of implementing corporate social responsibility strategies at the Johnson & Johnson In Kenya. School of Business http://erepository.uonbi.ac.ke/handle/11295/14496

Matten, D., & Moon, J. (2004). Corporate Social Responsibility. *Journal of Business Ethics*, *54*(4), 323–337. https://doi.org/10.1007/s10551-004-1822-0

Mintz, B. (1995). Business Participation in Health Care Policy Reform: Factors Contributing to Collective Action within the Business Community. *Social Problems*. https://doi.org/10.2307/3096855

Net Zero by 2050 – Analysis - IEA. (2021, May). IEA. https://www.iea.org/reports/net-zero-by-2050

Okereke, M. (2021). How pharmaceutical industries can address the growing problem of climate change. *The Journal of Climate Change and Health*, *4*, 100049. https://doi.org/10.1016/j.joclim.2021.100049

Olson, M. (1965). *Contemporary Sociological Theory*. Google Books. https://books.google.nl/books?hl=nl&lr=&id=I_x-pc2SJX0C&oi=fnd&pg=PA124&dq=olson+1965+collective+action&ots=_DdpUk90YA&sig=X3A2NTIL7bhi7DMwwxQ9ExD-rkw#v=onepage&q=olson%201965%20collective%20action&f=false

Olson, M. (1989). Collective Action. In *Palgrave Macmillan UK eBooks* (pp. 61–69). https://doi.org/10.1007/978-1-349-20313-0_5

Ostrom, E. (2009). Collective Action Theory. In *Oxford University Press eBooks* (pp. 186–208). https://doi.org/10.1093/oxfordhb/9780199566020.003.0008

Organimi. (2022, 20 april). *Johnson & Johnson's Organizational Structure [Interactive Chart] | Organimi*. https://www.organimi.com/organizational-structures/johnsonjohnson/#:~:text=As%20J%26J%20has%20grown%2C%20it,various%20functional%20and%20divisional%20groups

Our Targets & Our Progress. (2022). Janssen EMEA. https://www.janssen.com/emea/our-responsibility/society/society-planet/targets

pharma.be. (2023). *Over ons*. https://pharma.be/nl/over-ons

PharmaNewsIntelligence. (2022, November 1). *Exploring the benefits of a collaborative global pharmaceutical industry*. https://pharmanewsintel.com/features/exploring-the-benefits-of-a-collaborative-global-pharmaceutical-industry

Progress data dashboard - Science Based Targets. (2021). Science Based Targets. https://sciencebasedtargets.org/reports/sbti-progress-report-2021/progress-data-dashboard#datadashboard

Renewable Thermal Collaborative. (2023, August 9). *Renewable thermal collaborative*. https://www.renewablethermal.org/

Responsibility Standards for Suppliers. (2022). https://www.jnj.com/suppliers/responsibility-standards-for-suppliers-english

Responsible Supply Base - Johnson & Johnson Health for Humanity Report. (2022). Johnson & Johnson Health for Humanity Report. https://healthforhumanityreport.jnj.com/2022/accountability-innovation/responsible-supply-base.html

Rogelj, J., Geden, O., Cowie, A., & Reisinger, A. (2021). Net-zero emissions targets are vague: three ways to fix. *Nature*, *591*(7850), 365–368. https://doi.org/10.1038/d41586-021-00662-3

Rogelj, J., Schaeffer, M., Meinshausen, M., Knutti, R., Alcamo, J., Riahi, K., & Hare, W. (2015). Zero emission targets as long-term global goals for climate protection. *Environmental Research Letters*, *10*(10), 105007. https://doi.org/10.1088/1748-9326/10/10/105007

Rycroft-Malone, J., Burton, C. R., Wilkinson, J., Harvey, G., McCormack, B., Baker, R., Dopson, S., Graham, I. D., Staniszewska, S., Thompson, C. V., Ariss, S., Melville-Richards, L., & Williams, L. (2015). Collective action for implementation: a realist evaluation of organisational collaboration in healthcare. *Implementation Science*, *11*(1). https://doi.org/10.1186/s13012-016-0380-z

Salt, J. E. (2003). Chapter 34. Health and climate change: Implications for the pharmaceutical sector. In *Annual Reports in Medicinal Chemistry* (pp. 375–382). https://doi.org/10.1016/s0065-7743(03)38035-2

Shell Global. (2021). Shell. https://www.shell.com/energy-and-innovation/the-energy-future/our-climate-target.html

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Supplier Engagement - Johnson & Johnson Health for Humanity Report. (2022). Johnson & Johnson Health for Humanity Report. https://healthforhumanityreport.jnj.com/2022/accountability-innovation/responsible-supply-base/supplier-engagement.html

Sustainable Healthcare Coalition. (2022). Shcoalition. https://shcoalition.org/

THE 17 GOALS | Sustainable Development. (2023). https://sdgs.un.org/goals

The four-layer model of Williamson [106]. (2022). ResearchGate. https://www.researchgate.net/figure/The-four-layer-model-of-Williamson-106_fig2_356191947

The Four Types of Multinational Business. (2020, 20 augustus). *MKSH*. https://mksh.com/the-four-types-of-multinational-business/

The Shocking Size Of Johnson & Johnson. (2020). Daily Infographic. https://www.dailyinfographic.com/johnson-and-johnson-brands

Turcsanyi, J., & Sisaye, S. (2013). Corporate social responsibility and its link to financial performance. *World Journal of Science, Technology and Sustainable Development*, *10*(1), 4–18. https://doi.org/10.1108/20425941311313065

Ubacht, J. (2022), SEN2321 Master Thesis Preparation [PowerPoint slides]. Technical University Delft, Netherlands. Retrieved December 20, 2022, from: https://greatlibrary.nl/api/rest/v1/file/FwOu1RLLtsnGPRa46gOUzMLn/2021-2022+Research+flow+diagram+final.pdf

Unilever PLC. (2022, August 26). *Climate action*. Unilever. https://www.unilever.com/planet-and-society/climate-action/

United Nations. (2022). *Net Zero Coalition*. https://www.un.org/en/climatechange/net-zero-coalition

Vereniging Innovatieve Geneesmiddelen. (2023, May 12). *Over de Vereniging*. https://www.verenigninginnovatievegeneesmiddelen.nl/over-ons

Verhoef, L. (2023, January 30). EcoVadis: hoe werkt de rating en wat levert het je op? *MKB Servicedesk*. https://www.mkbservicedesk.nl/duurzaam-ondernemen/duurzaamheidskeurmerken/ecovadis-hoe-werkt-de-rating-en-wat-levert-het-je-op

What is corporate social responsibility (CSR)? (2022, November 8). BDC.ca. https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/glossary/corporate-social-responsibility

World Business Council for Sustainable Development. (2023). UNCCD. https://www.unccd.int/cso/world-business-council-sustainable-development#:~:text=Supports%20the%20global%20business%20community,favour%20of%20sustainable%20development%20solutions

York, A. M., Drummond, C., BurnSilver, S., Neuberg, S. L., & Anderies, J. M. (2021). Integrating institutional approaches and decision science to address climate change: a multi-level collective action research agenda. *Current Opinion in Environmental Sustainability*, *52*, 19–26. https://doi.org/10.1016/j.cosust.2021.06.001

Zameer, H., Wang, Y., & Saeed, M. R. (2021). Net-zero emission targets and the role of managerial environmental awareness, customer pressure, and regulatory control toward environmental

performance. *Business Strategy and the Environment*, *30*(8), 4223–4236. https://doi.org/10.1002/bse.2866

Appendix A: Results of literature review

A.1 Article selection for literature review

The literature for this review was selected in multiple steps. Google Scholar and Scopus were used to identify relevant literature. The 4 strings that are shown were used to research these sources, with the 4th string being applied to the Scopus search engine and the rest to Google Scholar. Figure 9 visualizes what steps were taken and how many articles were included and excluded in each step. The results of the literature selection are shown in table 11 with the used strings and short descriptions included.

- [1] Net zero emission goals AND multinationals
- [2] Corporate social responsibility AND JnJ
- [3] Corporate social responsibility
- [4] Multinationals AND climate action AND support

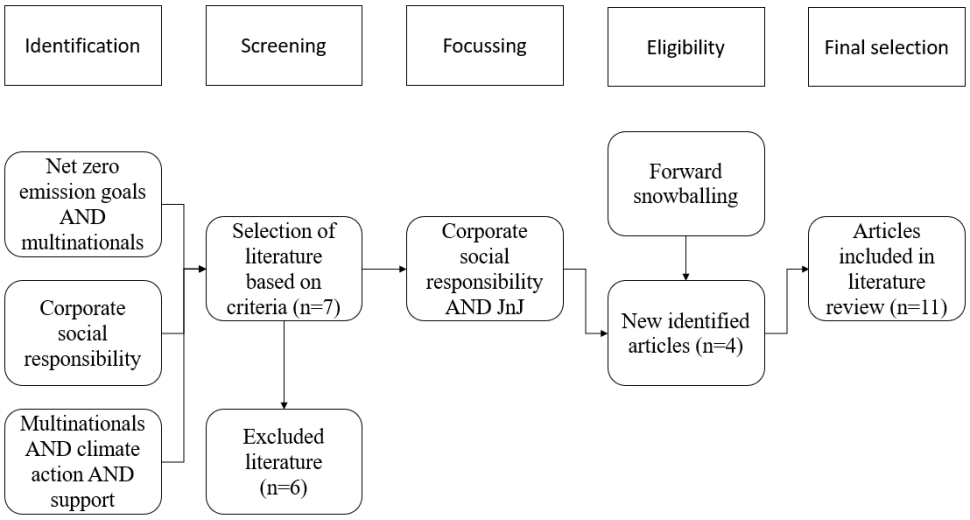

Figure 9: Scoping process

In the screening process, certain requirements were checked per source, to ensure that each source would be relevant to the literature review for this topic. On this basis, articles were excluded in this step. For the first string, it was important that the selected articles discussed general theories about net zero emission goals and how multinationals tackled them. For the second string, the corporate performance and corporate social responsibility of Johnson & Johnson needed to be discussed. The third string had to deliver sources that also talked about corporate performance, together with business and innovation. This would make the articles more relevant for the research because it would otherwise only entail theory and concept discussion. The results of the fourth string were evaluated on the inclusion of SBTi, institutions, and policy, which makes the literature search focus better on rules, climate action, and institutions that are prevalent.

A.2 Literature review results

Table 11: Results of literature review

Reference	Publishing year	String for searching	Contribution

Deutch	2020	1	A massive commitment of new resources and effective mobilization of government, the private sector, and energy consumers are necessary to achieve net zero emissions
Hill, Stephens & Smith	2003	2	Johnson & Johnson has been committed to corporate social responsibility for a long time now and it has brought its benefits for the company on multiple fronts. Recruiting and public opinion have improved for the company.
Immink, Louw, Garlick, Vosper & Brent	2021	4	Ethical and practical challenges that come with the implementation of climate action by firms is discussed and policy and managerial implications are provided. The SBTi helps firms achieve the climate goals, but this article provides a methodological approach to support these initiatives.
Lindgreen & Swaen	2010	3	Low awareness from actors and unfavorable attributions of corporate social responsibility activities impede efforts to maximize business benefits from those activities.
López, Arce & Osorio	2023	4	The role of multinational corporations is very important in supporting the fulfilment of emission reduction targets in host countries of that enterprise. The Intended Nationally Determined Contributions (INDC) set by the controlling country determine the emission reduction, however if more ambitious INDC is adopted regardless of the country of origin, these corporations would reduce emissions even further.
Maina	2021	2	A Johnson & Johnson case in Africa show the challenges of implementing corporate social responsibility strategies of the main corporation
Matten & Moon	2004	3	According to this scientific article, the main drivers of corporate social responsibility actions are: motivated individuals and the anticipation of future success being dependent on more institutional drivers.
Rogelj, Geden, Cowie & Reisinger	2021	1	the development of net-zero targets at the company level cannot be done by only involving natural scientists or economists. The article mentions: ‘’ Ethicists and social scientists are needed to help explore how fairness concepts apply to today’s multinational corporations — which span multiple countries and sectors, and involve staff on incomes ranging from the lowest to the highest. ‘’

Rogelj, Schaeffer, Meinshausen, Knutti, Alcamo, Riahi & Hare	2015	Snowballing, 1	This study concludes that net zero emission targets are a useful focal point for policymaking since it links a global temperature target and socioeconomic pathways to a long-term limit on cumulative CO2 emissions.
Turcsanyi & Sisaye, 2013	2013	2	A case study on Johnson & Johnson provides evidence on that the implementation of social and environmental goals can go hand in hand with sustainable profitability. CSR and sustainability have contributed to the economic performance of JnJ.
Zameer, Wang & Saeed	2021	1	Pivotal factors for achieving net zero emission targets are discussed. The role of, customer pressure, and regulatory control toward environmental performance is crucial in improving green production in corporations. Only managerial environmental awareness directly influences environmental performance directly.

Appendix B: Interview summaries

B.1 Interview 1: Johnson & Johnson Headquarters

In this interview, I discuss Johnson & Johnson's climate targets and activities with an employee of its headquarters We discussthe progress of achieving their 2030 climate targets, along with their ambitious vision for 2045. To understand the company's sustainability activities and the hurdles they navigate, I ask about current challenges that they face. The interviewee will be referred to as Interviewee A. Throughout the interview, Interviewee A offers valuable insights drawn from their vantage point within the organization, providing insights into the most important topics and activities.

With a multifaceted presence spanning pharmaceuticals, consumer goods, and medical devices, Johnson & Johnson emerges as a conglomerate of considerable complexity. The company is focused on tackling scope one, two, and three emissions. Interviewee A explains that the emissions linked to scope one and two, which are under the company's direct influence, are subject to comparatively facile control mechanisms. This control is facilitated by strategic actions such as the procurement of renewable energy and the enhancement of energy efficiency. Interviewee A alludes to the company's commendable progress towards these objectives, driven significantly by robust power purchase agreements (PPAs) for renewable energy in both Europe and the United States: ‘’So we are very close to meeting that goal, mostly through scope two, because we have very strong, what's called PPAs, power purchase agreements, for renewable energy across now 100% of Europe and US.’’.

Thermal heat is among others a big challenge for pharma companies, since scope 1 involves emissions caused by the production of pharmaceutical products which are made using really high thermal heat. There is no easy renewable substitution for this. New technologies need to be developed. Scope 1 and 2 emissions only make up about 10% of the company's emissions. However, the crux of the challenge emanates from scope three emissions, primarily originating from the acquisition of goods and services. As these emissions are intrinsically tied to procured goods and services, the task at hand involves decoupling emissions from expenditure. This entails honing data precision and establishing symbiotic collaborations with suppliers to streamline emissions reduction across the entire supply chain. The intricacies of scope three emissions demand precise tracking and close synchronization with suppliers. The transition towards activity-based reporting holds pivotal importance in this context.

‘’So what we're trying to do is, you know, do some industry level collaborations to try to roll up numbers like through the supply chain so that we can take emissions data from our suppliers, have it be accurate, verified, and have it flow into our own emissions data so that as our suppliers, through programs like energize, which we start in the pharmaceutical industry, which we're pushing renewable energy opportunities, and helping our suppliers go into the market, as well to purchase PPAs.’’ It is very difficult to work on sustainability projects that have a long-time span, mentions interviewee A. It is much easier and more efficient to focus on near term goals. Emission data reporting is very important, but comparable to financial reporting, since there are a lot of assumptions in emissions data.

Regarding the company's organizational structure, Interviewee A explains that Johnson & Johnson has a decentralized structure, allowing subsidiaries to have some freedom in implementing sustainability goals. The goals, however, are company-wide and consistent. While there is collaboration and sharing of best practices among different teams and subsidiaries, there can be variations in the pace of progress thanks to regional differences and varying customer demands. Interviewee A alos mentions the importance of alignment and communication to ensure that the company-wide goals are met. While

there are sector-specific teams that focus on different areas, such as medical devices, there is a need for continuous communication and alignment to ensure progress is consistent.

Inquiries about the interplay and collaboration among subsidiary entities, particularly in diverse regulatory landscapes, invite candid insights from interviewee A. Acknowledging the challenges, the interviewee underscores the significance of best practice sharing and the trial implementation of climate regulations across varying national contexts. The efficacy of collaboration hinges on structured meetings and circumventing redundant endeavors. Johnson & Johnson's strategy revolves around fostering a symbiotic relationship among subsidiaries, harnessing the wisdom gleaned from countries that have embraced new climate regulations.

When discussing the 2045 net zero emission goals interviewee A mentions: ‘’… it's going to be a major challenge not only for us, but almost everyone across the healthcare industry because of regulations also. Regulations are very strict around topics such as recycling. Only certain countries allow for recycling of high-end medical devices. We hope regulations start taking into consideration the impacts of not recycling update if all other standards can be met.’’. Also, consumers in the healthcare industry don’t have as much pressure from end consumers as in other industries. So, the next few years will be very important for the future of sustainable healthcare.

The interview encapsulates Johnson & Johnson's sustainability efforts, affording insights into their strides towards climate targets and the intricacies of reducing scope three emissions. It explores upon the company's commitment to sustainability, epitomized by their relentless pursuit of data precision and collaborative synergy. This narrative highlights Johnson & Johnson's steadfast dedication to attaining their audacious climate aspirations. Collaboration, data precision, and best practice sharing emerge as the pivotal tenets steering the company's enduring journey toward sustainability.

B.2 Interview 2: Janssen Netherlands (interview with 2 respondents)

The topic of this interview is on environmental and sustainability concerns at Johnson & Johnson (JnJ) in the Netherlands. The conversation centered on Johnson & Johnson's (J&J) initiatives in the Netherlands to cut emissions and meet sustainability targets. The cooperation between various companies in the Netherlands and how they cooperate to handle issues and achieve emissions reductions is one of the main topics of discussion. The participants in the conversation are Dutch employees of Johnson & Johnson. They will be referred to as interviewee B and C to assure their privacy.

Interviewees B and C work together frequently, and interviewee C talks about his involvement in sustainability programs and CO2 reduction techniques. They explain the main characteristics of their company and how they work within the Netherlands. They stress that JnJ in the Netherlands is a multi-sector firm with multiple companies, such as pharmaceuticals and medical technology. They confirm that they both are multi-sector within JnJ and that they therefore work with different facilities within the Netherlands.

Given that JnJ includes a number of facilities, I ask whether they are also associated with other businesses aside from Janssen and if there are employees at every site who are involved with sustainability activities. Interviewee C explains that although they are connected with every JnJ facility in the Netherlands, there are no specifically defined jobs for sustainability per site. There isn't a formal sustainability function in the Netherlands, despite the fact that some employees, such as sustainability engineers, work with sustainability as part of their roles.

As stated by interviewee B, the environmental health, and safety department used to include sustainability, but owing to an increased emphasis on sustainability, it was decided to have a separate sustainability installing a Chief Sustainability officer on corporate level. However, the implementation of this split is left to the discretion of each area/facility, facilities will take different ways towards sustainability and participate to differing degrees. Interviewee B argues that this is because of the need for an integrated system within the company and preventing separated clubs from forming. Interviewee C points out that several nations, like the United Kingdom and Belgium, appoint specific sustainability managers.

I examine Johnson & Johnson's Health for Humanity Report, paying close attention to how scope 1, 2, and 3 emissions are managed. I want to know what the biggest obstacles are in managing emissions, especially in scope 3, which includes suppliers and other parties. They explain that the numerous organizations and locations in the Netherlands present difficulties because of their various suppliers, procedures, and goals. There is more diversity in sites here than in Belgium because sites are designed differently and have different characteristics. They use the Leiden site as an example, noting that other sites might not have the J&J goal to become carbon neutral by 2025 (However, all sites by 2023). Janssen Biologics is very ambitious when it comes to sustainability compared to other Dutch sites. Implementing sustainable solutions is challenging due to infrastructural issues including electricity networks and technological constraints.

The limits of the electrical grid are emphasized by interviewee C, while interviewee B notes that present technology is not sufficiently evolved to make large-scale process installations environmentally friendly. These elements add to the difficulty of putting sustainable principles into practice. JnJ Netherlands is still highly dependent on technology developments.

According to the participants, identified as interviewee B and interviewee C, the Netherlands has switched to green energy as a whole thanks to a Power Purchase Agreement (PPA). Collaboration between J&J locations around the nation is still being explored, though. In order to link and promote

cooperation between the different NL sites, coordinate goals, and share expertise and best practices, they indicated plans to create an NL environmental council. The so-called Planet Council is meant to connect subsidiaries/ sites and stimulate collaboration. Corporate provides varying goals for different parts of the company. Some sites are only offices, which means that regulations and goals will be different for them concerning emission reductions compared to e.g. production sites. Since Covid, there is a general manager board within the Netherlands that focusses on the ambitions of the company nation-wide.

Regarding J&J's dedication to sustainability, they talked about the company's goals to reach CO2 neutrality by 2030 and net-zero emissions by 2045. They noted that the corporate policies and strategies are what motivate these ambitions. Corporate analyses the different subsidiaries and assesses at what sites most progress can be made on the sustainability front. That's why one of the locations, Janssen Biologics, has already committed to becoming CO2 neutral by 2025, and the corporate office regularly analyzes and revises strategies to meet long-term goals. The focus in the future will be on scope 3, since they are dependent on suppliers and contractors for achieving those targets. Interviewee C mentions that in the near futureless focus is on the scope 3 goals for now, and that there are initiatives and conversations taking place on a more global scale within the company.

When asked about internal sustainability objectives and whether it was possible to create regional goals, interviewee C clarified that J&J's goals in the Netherlands and Belgium aimed to be a little bit higher than the company's global objectives. They work with external stakeholders to obtain feedback and expectations, ensuring that they are in line with business goals while attempting to set the standard for sustainability initiatives in the local environment. However, they underlined the necessity to keep corporate control in check and avoid getting ahead of oneself.

When asked about possibilities to expand collaboration activities, the participants listed a number of initiatives for industry-wide collaboration in the pharmaceutical sector. J&J is a participant in a group working on sustainability and is a member of de Vereniging van Innovatieve Geneesmiddelen (VIG). They collaborate on sector-wide projects and share information via this platform with other pharmaceutical companies. They aim to tackle issues sector-wide and work together with other companies to do so. J&J is also working with TNO (Netherlands Organization for Applied Scientific Research) to build a coalition to solve sustainability and circularity issues.

They also indicated plans to host a conference that brings together various healthcare ecosystem participants, such as pharmaceutical firms, medical facilities, insurance providers, and patient organizations. In areas including CO2 reduction, circularity, education, and illness prevention, partnership in the interests of environmental and social sustainability is explored. Interviewee B finally emphasizes the need for collective action because one company within the sector cannot achieve their goals on their own. And as a small site, you need others even more. By collaborating, costs can be shared, and recycling can be significantly improved.

In short, the interview examines Johnson & Johnson's sustainability and environmental activities and challenges in the Netherlands. The lack of designated sustainability roles within the organization on site level, and the difficulties in managing emissions across several entities are all highlighted. The participants acknowledge that infrastructure and technology constraints prevent the adoption of sustainable alternatives. The conversation concluded by highlighting J&J's dedication to sustainability and their initiatives to work with industry partners, include stakeholders, and set challenging targets at both the local and global levels. They understand the value of working together to seek opportunities to solve problems related to emissions reduction, especially in areas like waste management and circularity. While corporate rules are important, they also seek to be proactive in the local environment and support the pharmaceutical industry's larger sustainability objectives.

B.3 Interview 3: Janssen Belgium

In an interview with an employee of Johnson & Johnson in Belgium that is occupied with sustainability matters, I discuss the sustainability goals of Johnson & Johnson (J&J). We talk about the company's climate and emissions targets and how they are communicated, as well as tackled. The interviewee in this summary is referred to as interviewee D, to assure anonymity.

The interview starts by shedding light on the pivotal cornerstones of J&J's sustainability roadmap. Their aspiration entails sourcing the entirety of the company's electricity requisites from renewable sources by 2025. Simultaneously, J&J is committed to a formidable 60% reduction in scope one and two emissions, and a 20% reduction in scope three emissions by 2030. Interviewee D corroborates these ambitious aspirations and elaborates that Belgium and the Netherlands have already begun realizing these objectives since 2020. This commendable progress is attributed to enterprising power purchase agreements (PPAs) and strategic investments in green energy ventures, such as the North Sea wind farm. In a resounding testament to their global commitment, interviewee D underscores the worldwide target of achieving 100% renewable electricity by 2025.

Interviewee D proceeds to expound on the intricacies of the scope one and two emissions reduction targets. A definitive aim of carbon neutrality within J&J's operational precincts is set for 2030. Notably, J&J's conscious choice to achieve complete carbon neutrality, even surpassing the benchmarks of science-based targets, exemplifies their resolute dedication. A further dimension encompasses the pursuit of reducing scope three emissions by 20% by 2030, utilizing the 2016 baseline as reference. It becomes evident that reducing scope three emissions, comprising diverse components like raw material procurement, logistical processes, clinical studies, and packaging, poses a formidable challenge. Interviewee D underscores the efficacy of supplier collaboration in ameliorating scope three emissions.

Inquiring into the modes of communication of these sustainability objectives within the company, both from a top-down and bottom-up perspective, interviewee D elaborates on the dynamics. External goals, including climate objectives, are disseminated through a top-down channel. The Chief Sustainability Officer, Paullette Frank, spearheads the articulation of targets, cascading them across the organizational spectrum and even into external platforms. There are also internal objectives that are communicated in a similar way. In addition, there is a bottom-up approach in which employees are given the opportunity to participate in sustainability projects and contribute good ideas. There are We Sustain teams that meet locally and regionally to exchange ideas and share best practices.

I then ask whether ideas are also exchanged between teams since the company is so large and spans over countless countries. Interviewee D confirms this and explains that best practices are shared between teams, even on an international level. Also, there is a sustainability department, called the Office of Sustainability, which is responsible for communicating ideas, as well as making a strategic vision for sustainability within J&J. The mechanisms that are currently in place to stimulate collaboration projects are mainly between the suppliers of various raw materials, packaging companies and the large pharmaceutical companies.

We then discuss the pressure from stakeholders and customers on J&J and whether this differs depending on the geographical region. Interviewee D explains that there are indeed differences in the pressure J&J experiences from stakeholders and customers, depending on the region in which they operate. In some regions, such as Europe, there is greater pressure and demand for sustainable products and services. In other regions, it could be that awareness and demand for sustainability are still developing. This makes quite a difference for companies. However, interviewee D stresses that as a global company, J&J is committed to sustainability and focused on meeting their goals regardless of the region in which they operate.

When I ask about the challenges J&J faces in achieving their sustainability goals, interviewee D mentions some key challenges, such as finding suitable sites for renewable energy projects, overcoming technical obstacles in implementing sustainable solutions, and raising awareness and employee involvement. Interviewee D emphasizes that J&J is determined to tackle these challenges and find solutions, as they believe that sustainability is crucial to creating a better future. When talking about regional collaborations, interviewee D underscores the motivation of J&J to share insights on non-competitive matters within the sector, when viable. Highlighting the merit of collaboration in tackling sustainability issues beyond interviewee advantages, interviewee D accentuates the industry-wide pursuit of common goals. The Belgian FPA emerges as a formidable sectoral entity, anchoring the pharmaceutical industry's concerted endeavors on sustainability themes and strategic approaches.

The discourse culminates with an exploration into the ramifications of J&J's sustainability endeavors on business performance and reputation. According to interviewee D, sustainability is increasingly acknowledged as a vital point for business success, and J&J has reaped the benefits of their initiatives. Evidence of these benefits comes forward in results such as cost savings caused by energy efficiency, the engrossment of employees, and the escalating market demand for sustainable products. Transparency emerges as a guiding light in this journey, with candid communication and consistent reporting on sustainability performance being instrumental in maintaining stakeholder trust and elevating J&J's standing. In addition to the fact that JnJ focuses very much on achieving climate goals, JnJ is also very concerned with the 3Ps: People Planet & Prosperity. JnJ is a very progressive company and the employees young and old are often very motivated to contribute to a positive impact on the environment.

In short, the interviewee discusses J&J's commitment to achieving ambitious sustainability goals. This includes reaching 100% renewable electricity and striving for carbon neutrality. The importance of both top-down and bottom-up communication and employee involvement is emphasized in this interview. It also discusses how J&J deals with stakeholder and customer pressures at the regional level, as well as the challenges and impact of sustainability efforts on business performance and reputation.

B.4 Interview 4: Pharmaceutical company 2

This interview is conducted with an employee of another pharmaceutical company within the Benelux. The interviewee is referred to as interviewee E. We discuss hot topics and challenges with reaching emission goals within the pharmaceutical sector. Before starting the interview, interviewee E states that students are paying more and more attention to sustainability. Interviewee E reveals that the company has been engaged in efforts to increase energy efficiency for ten years. Interviewee E oversees the company's energy budget and participates in the energy transformation.

Interviewee E continues by saying that by 2025, the company hopes to achieve global carbon neutrality. They have already taken steps to accomplish this target, and they are currently considering additional cuts to scope 1, 2, and 3 emissions. Interviewee E adds that all sites are accountable for meeting the emission reduction targets and that there is open communication across the organization regarding the targets. The company has created a transition strategy and is attempting to lower CO2 emissions by taking actions like utilizing heat pumps in place of natural gas.

Interviewee E explains that the company has a thorough understanding of its energy management and that they seek ways to increase energy efficiency when I ask how the company helps to reduce scope 1, 2, and 3 emissions. Additionally, they are trying to lower energy usage at the locations. Interviewee E makes clear that the program's implementation is accelerating.

The largest of the company's two main divisions is human pharmaceuticals, while the other is animal health. Interviewee E clarifies that the parent organization oversees communication and that each site's managers are responsible for accomplishing the goals when I inquire about how emissions reduction targets and actions are communicated inside the business. Interviewee E underlines that each site must adhere to strict regulations that must achieve the reduction goals.

The company uses heat pumps in addition to other strategies to cut emissions. Interviewee E explains that they have created a strategy to achieve the goals, considering various choices including switching from boilers to electrical systems and lowering energy usage on the property. Additionally, they are still working on moistening with steam. Steam is widely used in the pharmaceutical sector since nothing that is created, including viruses, germs, etc., is permitted to leave. By steaming at 121 degrees Celsius, this is achieved. They are presently searching for better and more effective techniques to speed up this procedure.

Interviewee E challenges the necessity of some energy sources for some production processes, such as hydrogen and geothermal energy. interviewee E says that by using power wisely, it would be able to lessen or do away with the need for a lot of heat. The energy requirements are quite low because the company manufactures drugs rather than massive amounts of other goods, making it possible to investigate more intelligent and effective energy utilization.

Interviewee E emphasizes the importance of a solid energy transition plan and the need to invest intelligently in assets that have a longer lifespan, considering the goal of achieving sustainability by 2050. interviewee E points out the potential issue of investing in assets that may need replacement soon due to changing regulations or technological advancements, highlighting the importance of foresight and strategic planning.

Interviewee E highlights the presence of a Dutch "country council" that promotes communication across the various sites in relation to collaboration within the company. They exchange expertise and data about sustainability-related efforts. Additionally, they have a plan manager in charge of sustainability issues who brings together people from several sites to promote cooperation and idea sharing. For instance, they collaborate to meet the criteria of ISO 50001 and talk about related subjects. Although the

company’s global partnership is mostly focused on the Netherlands, there is also international communication and knowledge sharing.

When I bring up the subject of cooperation outside of the company, especially with regard to Scope 3 emissions. There are initiatives at a higher organizational level, interviewee E explains, even if there are no active programs addressing Scope 3 emissions at the site level. Interviewee E speaks of the opportunity for cooperation with vendors and other pharmaceutical businesses to increase the sustainability of the entire supply chain. Interviewee E makes it clear that no one is currently assigned to work solely on Scope 3 emissions at the site level, though.

I inquire about the Science Based Targets program (SBTi), which seeks to establish emission reduction goals that are supported by science. Interviewee E acknowledges the significance of the project but admits to knowing nothing about its details and the degree of cooperation with other businesses. Interviewee E admits speaking with Johnson & Johnson in the past on energy efficiency tactics, but interviewee E is clear that there is currently no active ongoing collaboration with any other pharmaceutical company. Although interviewee E doesn't provide information on competitive issues, interviewee E does add to have had conversations with colleagues from other pharmaceutical businesses and that projects for renewable energies are occasionally considered.

In general, the interview highlights the company’s sustainability initiatives, such as the investigation of more efficient energy consumption and knowledge exchange inside the organization. The organization is involved in sustainability activities led by higher-level global initiatives, even though collaboration with external organizations appears to be restricted at the site level.

B.5 Interview 5: Supplier company A

An employee of a supplier company talks about his involvement in the company's support of environmental projects in this interview. The interviewee in this summary is referred to as interviewee F. The company of interviewee F produces chemicals for the pharmaceutical industry. The interviewee's responsibility is to support the divisions or business units functioning in the Benelux region of the company, which works through numerous business units. The interviewee is frequently involved with sustainability issues and helps the company with tackling issues and implementing strategies.

Interviewee F emphasizes that the company has set goals for reducing emissions, one of which is a decrease of 25% by 2030. Among the thousands of items they supply, the company has determined the top ten base chemicals that have the biggest influence on CO2 emissions. The company wants to lessen its carbon footprint by concentrating on these compounds and putting emission reduction strategies into place, such electrifying operations and using renewable energy sources. The decrease in the company's own emissions helps to lower the overall carbon impact of their customers' purchases.

The difficulties with Scope 3 emissions, which include emissions produced upstream and downstream in the supply chain, are also covered in the interview. Interviewee F notes that by giving them access to methodology, consulting connections, and best practices, the company pushes its suppliers to assess and lower their own carbon footprints. To ensure comparability and encourage collaboration on emissions reduction, the company wants industry-wide standardized approaches.

When talking about collaboration with other businesses, interviewee F emphasizes programs like Together for Sustainability and the World Business Council for Sustainable Development (WBCSD), where the company actively participates. Although initiatives involving pharmaceutical firms and suppliers are not mentioned, the company works with clients to find ways to lessen the environmental impact of their goods. This covers possibilities like switching to biobased products or using biomass balance products that use biobased resources in place of fossil ones.

It should be emphasized that the interview gives no specific information about current or upcoming efforts involving suppliers and pharmaceutical companies to achieve emission reduction targets. However, it highlights the company's dedication to sustainability, teamwork, and offering assistance and information exchange to its suppliers and clients across numerous industries.

We keep talking about sustainability and climate goals in the context of a business, concentrating on the chemical sector. Interviewee F describes the strategy used by the business to satisfy client requests for sustainability and climate goals. Interviewee F notes that although the business does not have stringent standards for consumers, it works to help them achieve their objectives. The company analyses the carbon footprint of its products annually and informs customers of the results. Customers may need information from other suppliers in the pharmaceutical sector, where there are other items, to accurately evaluate their own carbon footprint. Interviewee F emphasizes that these customer initiatives are voluntary and that suppliers are subject to higher requirements.

The company uses outside evaluations and codes of conduct to make sure suppliers are following the rules. They demand that their suppliers have an effective environmental management system, set targets, communicate those goals, and continuously lessen their impact. Although it is impractical to rate all suppliers individually, third parties like Ecovadis assist in grading environmental management procedures and giving assessments. The corporation mentioned in the interview, the company, establishes minimal requirements for their suppliers and promotes improvement by soliciting solutions from those that fall short of the acceptable benchmark.

Interviewee F emphasizes that the emphasis depends on the sector and activities engaged when questioned about potential improvements in the industry's climate goals and emissions reduction. Since the company is a bigger chemical firm, it emits roughly 100 million tons of CO2, with about 20% of those emissions coming from internal operations and 40–50% from raw materials. Interviewee F believes that the supply chain should share information in a similar way to how safety data sheets do to better understand the key impact areas and advance the entire sector.

Interviewee F thinks that cooperation and benefit-sharing between various businesses would be advantageous. Interviewee F however admits that assigning credit for emissions reductions in integrated business models has some difficulties. There are continuous discussions about distributing benefits and credits for lowering emissions from certain processes or utilizing CO2 that has been captured. Interviewee F also points out that different nations may have different levels of openness to cooperation and participation since some prioritize lowering emissions within their own borders while others may believe that investing in emission reduction abroad will have a bigger impact.

Finally, interviewee F affirms that collaborations are influenced by a company's reputation for sustainability and emissions reduction. Companies that have a good reputation in these fields are more inclined to work together, but those that don't put any effort into sustainability may encounter resistance from potential partners. This interview has highlighted the voluntary approach of interviewee F’s company to helping clients achieve their sustainability and climate goals. The use of external assessments for supplier compliance, the significance of information exchange across the supply chain, and the function of reputation in fostering collaboration are all covered in this article. The conversation also discusses how difficult it can be to calculate credits and rewards in integrated business models and how different nations have different goals for reducing emissions.

B.6 Interview 6: Supplier company B

An employee from a supplier company talks about their sustainability initiatives and objectives in this interview. The business manufactures polymers, including packaging materials, and provides a variety of businesses, including pharmaceutical firms. Interviewee G will be used in this summary to refer to the interviewee. The respondent says that the business manufactures product H, a methanol-based substance. In their manufacturing process, methanol is transformed into formaldehyde in water, and the polymer is then produced by further processing the formaldehyde. The automobile and pharmaceutical industries both employ the adaptable substance product H. It is renowned for its fortification, sturdiness, and minimal carbon footprint.

The business has several sustainability programs in place. Optimizing the use of steam in their manufacturing process is one of their main initiatives. They work together with a nearby waste incinerator to create steam by utilizing the waste heat from their activities. Through this partnership, the company uses less natural gas and yearly saves about 16 million cubic meters of natural gas.

Energy efficiency is another area of concern. The business is attempting to lower its electricity usage by putting energy-saving measures in place. Additionally, they are investigating the usage of renewable green methanol and thinking about setting up their own hydrogen plant to produce power locally. The business also wants to reduce emissions into the air and water. To burn organic waste and lower air pollution, they have installed an oven system. To further reduce their influence on the environment, they are constantly looking for ways to improve their water treatment procedures. Business understands the value of staying current with emerging technology and continuously enhancing its sustainability processes to bring about future advancements. They are willing to look at further strategies to lower emissions and improve environmental performance.

The organization works with nearby companies to pool resources like energy and steam, ensuring a steady supply and cutting prices. They are supplied with steam from waste heat from a nearby waste incinerator via a 1-kilometer steam conduit, which prevents them from using 16 million cubic meters of natural gas yearly. The business's sustainability initiatives center on optimizing steam and cutting down on electricity use. To reduce their reliance on outside sources, they are looking into options for green energy procurement and are thinking about constructing an on-site hydrogen plant. Additionally, energy-saving measures are being put into practice, like replacing obsolete equipment with more effective substitutes. They are thinking about buying wind energy, although they now rely on outside sources because of some limitations. The business invests in waste incineration, optimizes its processes, and investigates novel water treatment technologies to reduce emissions to air and water.

Working together with nearby businesses is essential for resource pooling and attaining shared objectives. They collaborate on tasks like energy monitoring, high-voltage stations, and steam supply. The corporations hold regular meetings and keep lines of communication open to discuss strategies, schedule maintenance shutdowns, and guarantee the dependability of utilities. While certain information is disclosed, others, including precise production information or potential business transactions, require confidentiality. Overall, there is a high level of trust between the businesses, and staff are familiar with one another's operations and uphold a cooperative environment.

As the company switches from the Emissions Trading System (ETS) to their own unique emissions permits, the mechanics of emissions sharing, and benefit distribution are still being worked out. To guarantee that expenses and benefits are fairly distributed, the companies will form an agreement. Both parties recognize their reliance and work to keep their relationships positive while identifying win-win solutions.

The business is dedicated to cutting emissions and improving energy use. They work together with nearby businesses to share resources like energy and steam, which lowers costs and boosts sustainability. To share knowledge and pick up tips from other businesses in the industry, the company regularly takes part in conferences on energy conservation held by the local government. The interview underlined the value of working together and picking up tips from other businesses that have similar production methods or environmental objectives. The business is actively looking for ways to work with other businesses, talking about upcoming projects, scheduled maintenance breaks, and potential synergies. They may discover areas for development and reach their sustainability goals by exchanging experiences and best practices.

Additionally, a key factor in the company's sustainability activities is customer demand. One of their clients has stringent sustainability requirements for its suppliers. The business must adhere to those sustainability requirements, such as procuring sustainable raw materials, to keep their business partnership. The company's production procedures and purchasing choices are influenced by customer needs, particularly those of significant clients.

Another crucial element for the business is compliance. The organization tries to comply with environmental legislation, energy efficiency standards, and client expectations while upholding the fundamental values of safety and compliance. The compliance procedure includes external audits and visits from government officials to make that the company works in accordance with legal requirements and client expectations. The conversation emphasizes the dynamic nature of sustainability initiatives, where teamwork, consumer demands, and regulatory requirements drive continual progress. To maintain its position at the forefront of sustainability practices, the company recognizes the necessity of adapting and learning from other businesses, both inside and outside of their industry.

Interviewee G contends that overall, the business is devoted to sustainability and has established challenging targets, such as becoming carbon-neutral by 2050. They place a high priority on energy efficiency, work with nearby businesses to utilize waste heat and concentrate on lowering emissions into the air and water. Additionally, they try to keep up with emerging technologies and enhance their sustainability policies over time. Hot topics include limiting pollutants, cutting back on energy use, and especially optimizing steam usage. Working together with nearby businesses is essential for resource sharing, coordinating utility supply, and attaining shared objectives. The businesses collaborate to solve issues and create solutions, and they keep lines of communication open.

Successful collaboration requires trust and cooperation, and even while disagreements may occur, the companies work to find solutions and provide support for one another. To show their proactive approach to decreasing emissions and solving climate concerns, they put a special emphasis on commitment to sustainability, collaboration with nearby businesses, and meeting client expectations. They prioritize regulatory and consumer demand compliance, actively participate in knowledge-sharing programs, and engage in open dialogue with nearby businesses. By making these measures, they want to maintain their financial stability while steadily increasing their sustainability performance.

B.7 Interview 7: Supplier company C

This interview transpired with an employee from a conglomerate enterprise deeply entrenched in supporting the pharmaceutical sector, spanning clinical research to drug manufacturing. The interviewee denoted as interviewee H, elaborated on the company's holistic approach, which encompasses commitments to net-zero objectives, meticulous waste management, judicious water conservation, and fostering biodiversity. All these endeavors pivot on the company's unwavering dedication to environmental sustainability.

Regarding emissions, the individual's company addresses scope one and two emissions. The corporation is aiming to move away from fossil fuels and move towards using renewable electricity for scope one emissions, which cover refrigerants and fossil fuel use. They are currently identifying all fossil fuel-burning equipment, determining their life cycles and replacement schedules, and exploring alternatives such as electric boilers or heat pumps. Unfortunately, the company of interviewee H encounters issues with some locations' low electrical capacity and the requirement to make sure there is room for additional equipment.

The company focussed on virtual purchasing power agreements, so that they can make large-scale purchases of renewable electricity to reduce scope two emissions. They look for chances to invest in large-scale renewable energy projects and take into account on-site solar projects. For this they are weighing choices like carports or rooftops. Through these methods, the corporation hopes to attain net-zero emissions in the future.

Regional issues are also prevalent, for example government initiatives to green the grid, notably in nations like Belgium and the Netherlands, have an indirect effect on the corporation. The company is aware that it cannot just rely on grid improvements and must individually acquire renewable electricity to speed its transition to 100% renewable energy. The company keeps an eye out for new regulations pertaining to facility efficiency that may impact their operations. This could even be the case when these regulations do not materially alter their main business plan.

One key component of the company's sustainability strategy is stakeholder interaction. Customers, suppliers, and business partners are all actively engaged. The business takes part in the Renewable Thermal Collaborative, which is a network that tackles the problem of decarbonizing high-temperature processes like sterilization and concentrating on renewable heat solutions. They work along with groups like the Sustainable Healthcare Coalition and Pistoia Alliance to model and reduce the carbon footprint of decentralized clinical trials, a complex area encompassing several institutions and doctor's offices.

The company also participates in programs like Manufacturer 2030 and Schneider Electric's Energize program, which both seek to increase the usage of renewable electricity in the supply chain and increase supplier sustainability activities. They understand how crucial it is for data to be transparent and clear to guarantee suppliers keep their promises.

We examine the difficulties of working together within the pharmaceutical industry for emission reduction projects as the interview continues. Given that many solutions are still in the early phases and not readily available off the shelf, one of the major issues noted is consumers' willingness to co-invest in and spend money on new projects. Business imperatives and returns on investment are key factors in motivating corporate cooperation and investment.

Collaboration efforts are also impacted by participant diversity and participant numbers. It has a greater impact and creates value when there is a unified direction and similar expectations among numerous organizations. However, certain projects can still go forward without a sizable number of partners even if only one consumer is prepared to co-invest and spearhead the endeavor.

Although a "trust but verify" attitude is frequently used, trust between companies is regarded as crucial. While a good working relationship and trust are crucial, businesses also need to confirm results and guarantee priority alignment. It is essential to strike a balance between confidence and verification because of the difficulties associated with carbon reduction projects and their nature.

The procurement of renewable electricity (like Schneider Electric's Energize program), joint work on renewable thermal solutions, and addressing the carbon footprint of clinical trials are projects within the sector that are thought to be significant for emission reduction. Process enhancements in the production of pharmaceuticals, environmentally friendly packaging, and data sharing and consistency for enhanced decision-making are some further areas of concentration.

Collaboration and data consistency are specifically mentioned as areas that need emphasis. Especially for smaller businesses, the present fragmentation of data providers and solutions adds complexity and makes it challenging to manage sustainability reporting and decision-making. To make data collection easier and give businesses along the supply chain a clear and understandable framework, more consolidation and collaboration are sought.

The business is dedicated to environmental sustainability in general, focusing on emissions reduction, the use of renewable energy, stakeholder engagement, and partnership with industry partners to address the climatic problems faced by the pharmaceutical industry. This interview focuses on the difficulties and chances for cooperation in the pharmaceutical industry for programs to reduce emissions. The necessity for data consistency and collaboration, the readiness to co-invest, and the need for a common direction all stand out as important components in fostering effective collaboration and accomplishing sustainable goals.

Appendix C: Informed consent form template

You are being invited to participate in a research study titled ***Collaborative action between subsidiary companies and lessons for the private sector on taking effective climate action and limiting the rising global temperature; a case study on Johnson & Johnson.*** This study is being done by Jeroen van Paassen, a Master's student from the Delft University of Technology.

The purpose of this research study is to gain insights into the net-zero emission efforts of multinational corporations and will take you approximately 30 minutes to complete. The interview will be used for research and educational purposes. I will be asking you to answer questions concerning the sustainability efforts of your company and your role in the company.

This interview will be recorded and a transcript of the discussion will be produced and will be safely stored in TUD (TU Delft) only accessible to Jeroen and the supervisory team. The transcript will be used for analysis purposes, and to generate a summary of this discussion. The interview recording and transcript will be deleted at the latest 1 month after the completion of the study. The summary will be made publicly available with the associated MS Thesis work.

As with any online activity, the risk of a breach is always possible. To the best of our ability, your answers in this study will remain confidential. We will minimize any risks by only using names and company positions. This information will be stored on a TU Delft WebDrive. Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions.

We will send you the summary of our discussion before it is made publicly available, as to ensure that we do not misrepresent your activity and perspective.

Corresponding researcher: Jeroen van Paassen, Responsible researcher: Amineh Ghorbani,

Explicit Consent points

PLEASE TICK THE APPROPRIATE BOXES	**Yes**	**No**
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information above or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves the interview audio being recorded, with the audio being transcribed as text, and where the recording and transcript will ultimately be destroyed after the research is completed.	☐	☐

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
4. I understand that the study will end in August 2023.	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) (function and company) and associated personally identifiable research data (PIRD) (company performance information) with the potential risk of my identity being revealed.	☐	☐
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach: secure data storage, limited access.	☐	☐
C: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
7. I give permission for summary of the interview to be publicly archived in TU Delft Educational Repository so it can be used for future research and learning.	☐	☐

Signatures

_____	_____	_____
Name of participant [printed]	Signature	Date
_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information: Jeroen van Paassen

Appendix D: Atlas.ti coding

Table 12: All codes included in the interviews

Name	Grounded	Density	Groups
Challenges for emission...	32	0	[AI codes]
Collective initiatives	9	0	
Company characteristics	99	0	[AI codes]
Face-to-face communic...	2	0	
Freedom to enter or exit	0	0	
Heterogeneity	5	0	
Information about pas a...	0	0	
Levels of cooperation	44	0	
Linkage structure	14	0	
Management activities	70	0	[AI codes]
Net benefits	4	0	
Number of participants	2	0	
Reciprocity	2	0	
Reputation	2	0	
Subtractive or shared re...	4	0	
Sustainability	90	0	[AI codes]
Trust	5	0	

Table 12 shows the main groups of codes that were used in Atlas.ti, and the frequency in which they recurred in the interviews. Company characteristics, management activities, levels of cooperation, and sustainability were the most discussed topics. This is because those were the main topics of the interviews. The collective action concepts were not nearly mentioned as much. The interviews were all semi structured, and only the interviews with the representatives of the supplier companies were specifically focussed on these topics, which is why their reoccurrence is considerably lower.