



DOCTORAL (PhD) DISSERTATION

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CO-OPETITION IN THE CONTEXT OF SUSTAINABILITY
GOALS

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LIST OF ABBREVIATIONS

SDG - Sustainability Goals

UN - Unit Nation

SPP - Sustainable Procurement Pledge

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1. INTRODUCTION

Lasting and thus sustainable development consists of "Die Bedürfnisse der Gegenwart zu befriedigen, ohne die Fähigkeit künftiger Generationen zu gefährden, ihre eigenen Bedürfnisse zu befriedigen" (Brundland et al. (1987)). Businesses play an essential role in achieving the goals of sustainable development, as they produce and provide goods and services using natural and social resources on a large scale. Thus, sustainability refers to many individual processes and pathways (e.g. sustainable production from finite resources and consumption and end-user behaviour, innovation and individual supply chains).

The idea for this research project stems from my practical professional experience. During my work at the second largest cargo airport in Europe, the question arose of how cooperation is influenced by sustainability goals. This is because during my work I was able to observe the establishment of the world's largest logistics service provider as well as other logistics companies. Their growth was also due to the collaboration of cooperation partners and competitors. In particular, the topic of "sustainability" was already implemented as a corporate strategy in this sector a few years ago. Probably also because transport by air leaves a much higher CO₂ footprint than transport by water, road or rail. Perhaps also because consumers are becoming increasingly aware that long supply chains do not necessarily contribute to sustainability. The Corona Covid-19 pandemic was the latest example of how much disruptions in supply chains influence business activities and have an economic impact. Although the last few years have made this increasingly clear, cooperation has grown not only in the logistics sector, but also in all other sectors of the economy. However, the vast majority of these relationships take the form of cooperation. Nevertheless, cooperation between competitors has also been noted for some time, the so-called cooperation, i.e. the

simultaneous existence of cooperation and competition between competitors. From our own observations, it is obvious that the motivation for these connections has arisen from the pressure related to the Global Goals for Sustainable Development, which were adopted by the world community in 2015 as Agenda 2030. Both the systemic character and the large scale of sustainability challenges require future interaction of multiple actors at different levels: within and between industries, sectors and countries.

Looking at companies in Germany, there were around 3.03 million taxable companies with annual supplies and services over 22 thousand euro in 2020 (J. Rudnicka, 2023)). In particular, the tertiary sector, the so-called service sector, led in 2021 with around 75%, followed by the secondary sector, the manufacturing sector, with around 24%. Above all, the automotive industry and its suppliers as well as logistics service providers are among the largest companies in Germany. Existing companies in particular feel the pressure to improve and strive for excellence in order to achieve economic, social and environmental benefits. In order to achieve this further development, technological advantage and market assertion, companies must increasingly cooperate with other companies. While in the past it was still cooperation with other market participants, mergers with competitors are increasingly being observed. Under these circumstances, the increasing demand for sustainable production and the valuable use of resources in a globalised economy confront today's companies with accelerated market dynamics, intensified competition and constantly growing product demands. Against the backdrop of these challenges, interorganisational arrangements in particular are becoming the focus of interest (Herzog (2011)). This means that we are not so much faced with decisions between "competition" or "cooperation", but rather with the search for effective design of both sides. As a result of this phenomenon of simultaneous competition and cooperation, the term "coopetition" was coined.

A small number of different research papers describe these mergers. For example, the cooperation in the automotive industry, in which Toyota and General Motors to build fuel cell powered cars (Chin et al., 2008)) or the strategic thinking of Amazon to create value by focusing on collaboration with competitors (Ritala and Tidström (2014).

Although coopetition can combine the best of cooperation and competition, especially in relation to sustainability technologies, there are only fragmented and limited scholarly articles on the subject, despite a steady stream of published studies in this area over the last two decades. Related to this, while research has certainly pointed to the new development, a continuous and in-depth engagement with this paradox, is only slowly being observed and still proves to be of little enlightenment. Most research in the field of coopetition focuses on questions of the advantages and disadvantages of such an alliance. Dagnino and Rocco (2011); Garraffo and Siregar (2021) Himpel (2009). The implications of coopetition in the context of sustainability issues are less explored. A large body of research aims to explore the benefits of these mergers and the legal frameworks associated with them Bouncken et al. (2015). For example, academic literature has pointed out that while coopetition improves financial performance (Luo (2014)) and create new markets (Ritala et al. (2014)), but is also a risky strategy that can lead to negative consequences such as opportunistic behaviour, conflict and free-riding (Quintana-García and Benavides-Velasco (2004)). Sustainable motivations are often neglected in research; therefore, they are poorly represented in the literature. Publications mainly deal with inter-organisational cooperation, i.e. cross-sectoral cooperation for sustainability (Pedersen et al. (2021); DiVito et al. (2021)). Although the literature emphasises the importance of interactions between actors in the same sector, the main focus is on cross-sectoral relationships. Likewise, there is an increasing focus only on the benefits of coopetition, but

the motivations that lead to this are rarely mentioned. For example, the relationship between co-competition and innovation performance is examined (Bagherzadeh et al. (2022) Planko et al. (2019), Bengtsson (2014)) also explores coping with uncertainty, taking risks, exploring and seizing opportunities, and developing innovative solutions (Galkina and Lundgren-Henriksson (2017) but these are only exceptional phenomena in this field of research. However, when global surveys of managers are taken into account, it is found that the environment is recognised as an important issue. However, there is uncertainty about how to address these environmental sustainability challenges on a co-competition basis (Elliot (2013, p. 1)). Combine this finding with the Intergovernmental Panel on Climate Change's calls to address human behaviour in relation to adverse environmental impacts (IPCC (2007)) and the United Nations Framework Convention on Climate Change, which was ratified in 2007 and accepted by a total of 192 countries, one notes the increasing importance of future sustainability. Businesses have a key role to play in driving these changes in current climate policy. Businesses play a crucial role in achieving these environmental goals. There is clear scientific evidence that business activities have a significant impact on the economics of climate change. In both positive and negative ways (Stern (2011, p. 1)). In conclusion, it can be said that co-competition in relation to sustainability goals is a significant, albeit under-researched, phenomenon with potentially promising practical implications. This is because cooperation between competitors is increasingly observed in the context of sustainability issues. Therefore, more evidence and systematisation of the outcomes of co-competition as a function of sustainability goals is needed. To fill these gaps, this paper addresses both the reasons for co-competition in relation to sustainability and why such cooperation is initiated and carried out, and finally the outcomes that this process leads to. It also looks at how the multiplex requirements of competition, cooperation and the three pillars of sustainability, i.e. economic, social and environmental, are ultimately

interrelated. The aim of this dissertation is to gain an understanding of the reasons for motivation and to understand and use decision-making criteria in the future.

This thesis is divided into three chapters. The first chapter begins with the derivation of the research task and explains which gaps in the current literature can be closed. Chapter 2 contains the literature review, which is subdivided into three sections. The first section deals with the term competition and begins with an overview of relevant theoretical approaches from the research area. The second section looks at the literature that deals with sustainability. In further subchapters, the relevance of the sustainability principle and sustainability in companies is examined. In the third and last subsection, the influence of sustainability on competition and corporate competition in the pursuit of environmental and climate protection goals is explained. Chapter 3 contains the research methodology used in this thesis. While working on the research topic, I gained insights that were based on objective, professional opinions due to my work environment, but were not sufficient for a large-scale research study. This is because an already conducted survey, which was broadly based and included a rational questionnaire survey, could not reach the sufficient number of addressees with decision-making responsibility, such as senior executives with managerial responsibility or managing directors of medium-sized or large companies. For this reason, research using the Q-method will be used to reliably substantiate the hypotheses posed. The additional knowledge gained from the surveys will be used to support the hypotheses. Due to the approach, a detailed explanation of why the respective methods were chosen, how they were applied and how the data quality is ensured is described in detail. Subsequently, the results are discussed, the limitations of the work are pointed out and a final conclusion is drawn.

2. OBJECTIVE OF THE DISSERTATION

Due to my professional training and my many years of experience in the logistics industry, I have already been able to observe mergers of competitors, but have not yet been able to summarise them from an environmental point of view. The aim of my work is to identify the advantages and benefits, in particular due to the globally adopted sustainability goals with Agenda 2030, which result from the experience and drive of entrepreneurs and which support them in the future or possibly prevent them from entering into a successful cooperation with competitors as a company. After all, sustainability and sustainable development means striking a balance between meeting the needs of current generations and the impact on the ability to meet the needs of future generations (Hauff (1987)). Innovations can make a significant contribution to this (Fernandez et al. (2021)). Because "sustainability as a driver for innovation" versus "innovation as a driver for sustainability" can be seen as a strategy for sustainable development of companies. Environmental protection and economic development are not contradictory in today's world and the perception of the supposed opposition between economy and ecology is slowly and steadily changing. This development coincided with the scientific debate on "ecological modernisation" (O'Riordan and Weale (1991)). This means that a conflict between the economy and the environment can represent a "win-win situation". An essential approach is thus the increasingly efficient and environmentally compatible use of raw materials, energy sources and environmental media (soil, water, air). The basic idea was an environmental economic insight that ecology and economy need not be opposites. Insofar as the economy also applies ecological aspects, for example by including them in its production functions and calculations instead of ignoring them (internalising instead of externalising), then ecologisation does not mean an impediment to further growth and progress, but becomes the basis for it (O'Riordan and Weale (1991)).

Much research has been done in the field of cooperation, but the key research question remains unanswered:

What influence do sustainability goals have on cooperation?

My hypotheses therefore deal with structural change in the economy and are based on opinion formers that can be substantiated on the basis of scientific research:

H1. The demand for improved environmental awareness and the intensifying competition should lead to an increased merger between competitors, because companies want to reduce their costs and retain their customers with sustainability and protection of the environment.

In the literature, the main drivers in the entire value chain of manufacturing are seen in the extraction of the raw material the preliminary product, the processing of the product, the exchange of goods, the use by the consumer and the recycling of the product. It is assumed that this will lead to a change in cross-company structures, so that all business areas can be affected. This means that competing companies pool their similar resources to share risks and reduce the overlap in resource use for similar tasks.

H2. Business is undergoing a transformation due to increasing environmental awareness. Regardless of the aspirations of cooperation, more experience in cooperation and networking leads to more willingness among companies to join forces with value competitors from a sustainability point of view.

It has already been noted that this tendency is found in larger groups. One can therefore make the assumption that previous experience in the field of competitive cooperation can have a positive effect on cooperation with

competitors. Especially in the case of innovation and resource scarcity, experience in the field of coopetition can bring substantial advantages.

H3: Companies that want to continue to hold their own in the market could face losses in the future. Only those who cooperate with market participants will have better market opportunities in the future.

For some years now, strong price fluctuations and even price explosions have been noticeable for raw materials due to scarce resources. This leads to regional conflicts over raw materials and reduces companies' profit margins. In the future, such market tensions are increasingly expected. Insofar as companies want to continue to assert themselves in the market on their own, it can be assumed that risks borne alone can lead to higher losses and a reduction in market shares.

H4: Companies that pay attention to the environmental and social impacts of their core business are more forward-looking, more risk-conscious and better positioned overall. The willingness to cooperate with a competitor is much higher.

It is noted that companies that identify more consciously with sustainable products in the future also do this together with competitors. For example, large Sorting goods manufacturers cooperate with each other even though they are competitors in the market. For example, large Sorting goods manufacturers cooperate with each other, even though they are competitors in the market, because they recognise the need to jointly influence suppliers to achieve the common goal and to point out environmental and social standards to suppliers and make commitments to implement them. The result of this coopetition was fewer accidents and better quality delivery. Another effect was that the consumer had a better feeling when buying a product.

With regard to the aforementioned hypotheses, the current trends and future directions are presented. It is aware that there are nevertheless current controversial discussions on the topic of competition in the business world, in which research is also struggling. However, in view of the sustainability goals, it is nevertheless to be expected that cooperation between different levels and competitors will increase. This will be discussed and presented in the literature reviews below.

2.1. Choice of methods

Based on the research questions and the underlying research gap, it is necessary to understand the reasons for cooperation and the main drivers among companies. In this paper, a qualitative research approach is taken to explore the multiple aspects of mergers and the impact on future decisions. This is done with an empirical survey from a Q-method approach, a research technique aiming at a systematic investigation of subjectivity (Stephenson, 1953). The aim is to uncover existing patterns. In this survey, 23 participants set their preferences for this purpose using the Q-tables. The statements used in the survey were developed on the basis of experts, findings already obtained from similar studies in the literature are also taken into account. According to my hypothesis, four different groups with corresponding opinions based on the Q method can be distinguished in the process:

1. the group of managers who, due to their qualification or current job, already have experience with competitor cooperation as well as a positive awareness of sustainability, and are optimistic about this connection.
2. the second opinion group consists of managers who do not have a significant influence on joint cooperation with competitors and do not see sustainability aspects influenced by corporate action.

3. this group of leaders who see sustainability as a frontline decision to enter into cooperation with competitors.

The last opinion group consists of those managers who tend to see the economic perspective as the main driver and weigh up whether they would enter into a cooperation from a purely ecological perspective.

The results of the research will lead to the formulation of proposals on how to support cooperation taking into account sustainability considerations. Attention to those who have already experienced collaboration with competitors and raising awareness of the impact and influence of different approaches of different stakeholders should provide useful insights. Thus, it can be crucial for entrepreneurs to choose their strategic approach in order to make an informed and conscious decision to cooperation.

3. LITERATURE RESEARCH

In recent years, two topics relevant to business have developed, which are to be linked as a result of this work. On the one hand, many articles have been written about the cooperation of competitors and the resulting market development opportunities, benefits and risks for the companies. On the other hand, a great deal has been published on the topics of sustainability and sustainability goals. Based on the literature review, the results of previous research are summarised. From this summary, several research questions were derived, which form the basis for the objectives of the dissertation. In order to conduct a systematic literature search and analysis, keywords first had to be identified. *EBSCOhost* was selected as the basic business database.

For the search, the terms: "*Coopetition*" OR "*Coopetition*" AND "*Sustainable*" OR "*Sustainability*" were chosen as keywords.

Due to the broad limitation of the keywords, the search in the database resulted in 1,744 titles. In stage 1, all works were excluded whose titles were available in non-topic databases. In stage 2, the search evaluation was narrowed down into subject fields. Subject areas were excluded that went into the medical or psychological field and had no connection to the economic field. In stage 3, all articles and publications were screened according to topic and, in stage 4, narrowed down to German- and English-language articles. Furthermore, the papers were again screened and their content checked, and only relevant research articles related to the dissertation topic were included in stage 5. The full texts of the publications were found via various databases such as SCOPUS, Springer-Verlag, ScienceDirect.

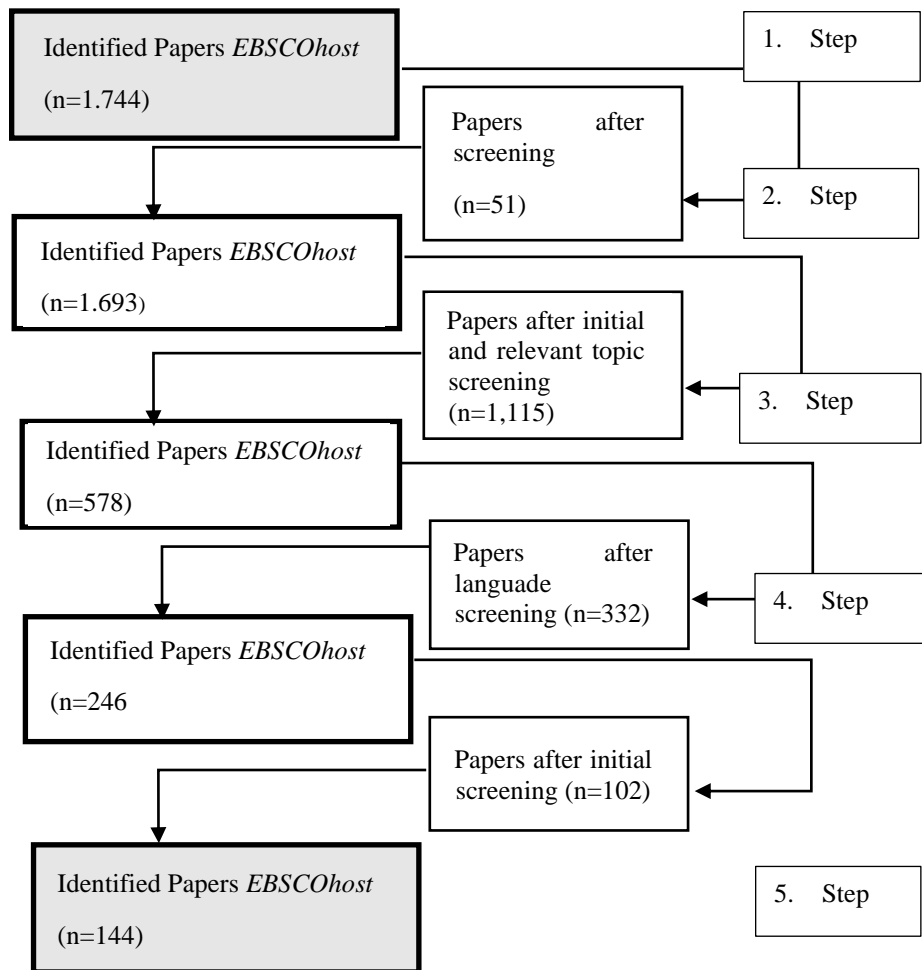


Figure 1:PRISMA.flowchart (own illustration)

In recent years, two topics relevant to business have developed, which will be linked as a result of this work. On the one hand, many articles have been published on competition, which is the starting point of the research, and the increasing question of sustainability. Due to the two topics that are included in the research, the following chapter is therefore divided into three sub-chapters. The first sub-chapter analyses the literature on the topic of competition and defines this term, which forms the basis for a comprehensive consideration of the topic. The second subchapter deals with the topic of sustainability and sustainability goals in the context of the 2030 Agenda. Here, too, a definition is given and the existing literature is analysed.

The objective of the literature review is to identify and discuss research questions that are fundamental to the research topic. Furthermore, to present and critically examine previous research and to show how this research relates to the existing body of knowledge and to identify gaps in the current body of knowledge.

3.1. Coopetition

The following section deals with the term coopetition and begins with the definition of the term, which only found its way into the field of research in the literature in the late 20th century. The origins and background of the term are examined. This is followed by an overview of relevant theoretical approaches from the research field. It will be shown which motivational backgrounds companies pursue when they enter into cooperation with competitors. Furthermore, the different areas and levels are dealt with. It is interesting to note that not only different companies in a sector, but also internal departments of a company as well as different companies at different levels of the value chain can enter into a co-opetition.

3.1.1. Definition of Coopetition

In order to understand the motivation of a cooperation between competitors, the terms must first be examined.

The term "coopetition" is derived from the English words "cooperation" and "competition" and is thus understood as a relationship built on simultaneous competition and cooperation. Co-operation as a combination is intended to make mutual dependence more efficient and effective and thus generate higher economic rents than would be the case with pure competition (Porter (2014)) or pure cooperation. The strategy is based on the idea that by competitors working together, total value can be created and shared (Porter and Kramer, (2011)). A large number of scholars agree that Raymond John Noorda, CEO

of the software company Novell, first coined the term in the 1980s/1990s and is thus considered by many to be the creator of coopetition (Daidj (2017)). The first authors to shape the paradox as the term "coopetition" and actually address it scientifically were Brandenburger and Nalebuff (1996).

3.1.2. Emergence of Coopetition

Despite the fact that academics made a significant contribution to early network research, it was not until the early 1990s that the term "coopetition" began to gain relevance. This is because in the past, competition and cooperation were generally separated, but more recently the coopetition paradigm has emerged, meaning that companies not only either cooperate or compete with certain stakeholders, but often do both at the same time (Ritala et al. (2014)). There is clear evidence of coopetition in different sectors, such as air transport ((Himpel, 2009), (Conrady et al. (2019))); tourism industry Chim-Miki and Batista-Canino (2017); Nguyen et al. (2019)) Biotechnology (Garcia and Velasco (2002)) or automotive industry (Cheng and Fan (2021); Akpinar and Vincze (2016)). But why do competitors join forces? Through strategic alliances, networks and other partnerships, companies seek to improve their performance because resources, capabilities and risks can be shared under these conditions and indeed it often creates added value for end customers and the companies involved, especially when it brings about improvements in existing products and services, creates entirely new ones or increases competition between competing networks (Ritala (2001)).

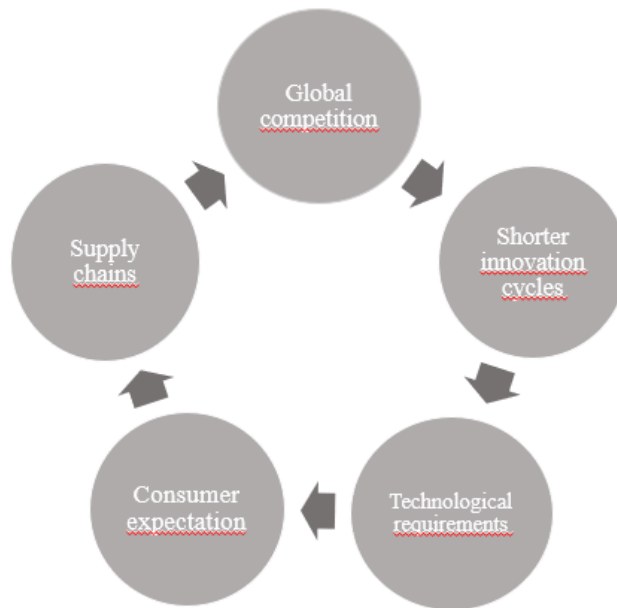


Figure 2: Coopetition characteristics (Own illustration)

Various research papers refer to the origin of coopetition on game-theoretical approaches in relation to real mixed-motive games, which can be traced back to Brandenburger and Nalebuff (1996)). They analysed competition using game theory and conceptualised competition as a plussum game rather than a zero-sum game where players (rivals) can win even if rivals do not lose. Nalebuff and Brandenburger were convinced that business life can be compared to war as an extreme form of competition, and that only those who destroy others will succeed in the long run. The existence of considerably more winners or companies that survive and survive in the market than would be expected under fierce competition, however, shows in their opinion that this radical thesis is not tenable. The same applies, in her opinion, to the counter-thesis that business relations are to be equated with peace as the extreme form of cooperation. As a result, in her opinion, there must be a solution that contains both characteristics of competition and cooperation. A state they call coopetition. Another research focus on this topic was set by Bengtsson and Kock in the 2000s in an explorative study on the coordination

of networks. According to this study, relationships between competitors are not only competitive, but both sides benefit if cooperative aspects are also emphasised and cultivated. Bengtsson and Kock (2000).

Porter and Kramer also concluded that the approach is based on the consideration that an overall value of competitions can be created and shared (Porter and Kramer, 2011). The basic motivation here is to create a competitive advantage over further counterparts through close cooperation, be it through new access to contacts, improved productivity and/or quality, access to raw materials or through reduced risks. Furthermore, this form offers advantages for companies facing increasing pressure to integrate the global value chain, due to

- "(a) the increasing importance of economies of scale and the internalisation of global activities,
- (b) the reduction of profit margins as a result of global competition or declining demand, and
- (c) the increasing need to improve productivity and efficiency".

In each case, cooperation is becoming more and more compelling" (Luo (2007)). Furthermore, Bouncken points out that this cooperation is usually anchored in the corporate strategy and is needed to cope with the dynamic business field with fluctuating uncertainties ((Bouncken et al., 2015)). Furthermore Padula and Dagnino (2007) point out that coepetition enables companies that manage partially overlapping and converging interests and goals to create value by cooperating and competing simultaneously.

Although the paradox of coepetition has been interpreted in many ways in different theoretical frameworks in the research world, it has always been based on the same premise that coepetition refers to cooperation with competitors. Since then, a rising trend in research can be observed. With the

emergence of mergers of competitors and the term "coopetition" developed from this. It can be summarised that researchers are looking more and more into this topic. Data from ScienceDirect.com (2021) show that this topic has received a lot of attention, especially in recent years. Coopetition has thus demonstrably become a key area of management research. The number of articles with coopetition in the title has grown steadily in recent years (42 articles in 2014 vs. 75 in 2021). This increase in the number of coopetition articles has also led to a shift in research focus and approaches in the study of coopetition.

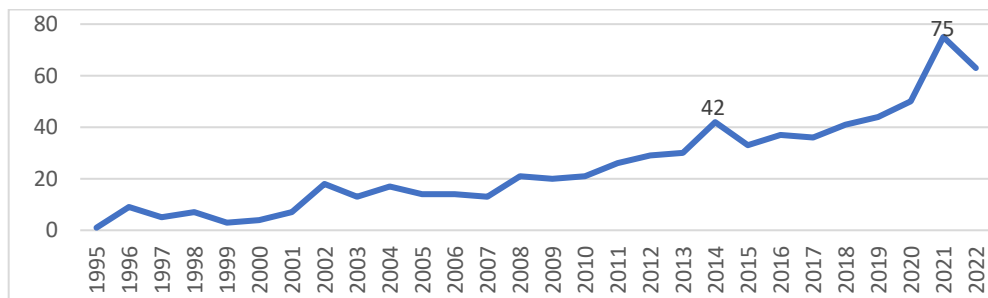


Figure 3: Number of publications of Coopetition since 1996, based on ScienceDirekt (07/2022)

3.1.3. Functional levels of coopetition

Most research in the field of coopetition generally refers to the advantages and disadvantages of such an alliance (Dagnino and Rocco (2011)); (Garraffo and Siregar (2021)); (Raza-Ullah (2021), whose time limit (Cygler et al. (2018) or in which areas coopetition is most beneficial (Ritala and Hurmelinna-Laukkanen (2009)), yet further research has expanded the definition of coopetition. Different levels of research in this field have emerged in the literature. On the one hand, there are research approaches at the network level and, on the other hand, between different actors, such as between suppliers and customers. Raza-Ullah et al. (2014) cites as an example that simultaneous

cooperation and competition between companies leads to tensions that arise at the individual, organisational and inter-organisational levels. Furthermore, interorganisational and intraorganisational cooperation have been differentiated in the research literature. In this context, interorganisational cooperation examines the design possibilities of relationship networking between several companies (Luo (2004)). This already found its origin in the game theory approaches of Brandenburger and Nalebuff (1996). Sydow points out that interorganisational cooperation is an organisational form aimed at realising competitive advantages, which is characterised by complex mutual, rather cooperative relationships between legally independent, but economically mostly dependent enterprises (Sydow (2005)).

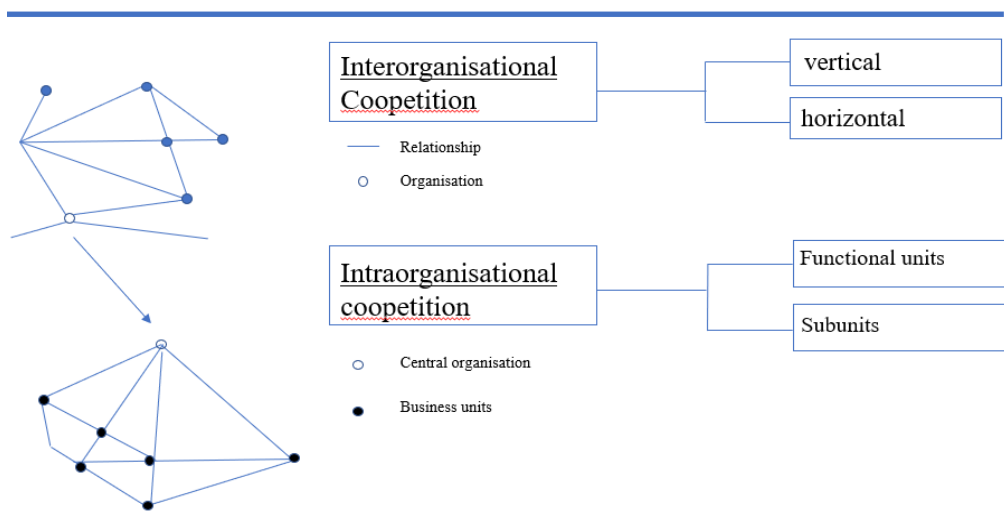


Figure 4: Schematic demarcation of inter- and intraorganisational cooperation

The cooperation of an organisation with its competitors on an inter-organisational level can have different reasons. The most common ones are access to essential resources and knowledge (Bengtsson and Kock (2000)), sharing resources and knowledge to improve efficiency, developing technical innovations through cooperation in research and development ((Bengtsson and Kock (2014); Walley (2007))), reduce risks, share costs (Bouncken et al.

(2015)), achieve economies of scale by combining similar activities (Gnyawali and Park (2011)), open up new markets (Gnyawali and Park (2009)) and achieve economies of scope by combining complementary activities. (Luo (2005)). Lou (2004) points out that the higher the relatedness in product and market domains between two competitors, the more the scope of cooperation is likely to expand. McDonnell Douglas (merged with Boeing in 1997), for example, competes and cooperates with Mitsubishi Heavy Industries largely at the corporate level: both produce F-15 fighter aircraft, commercial helicopters and the new MD-900 Explorer helicopter, and compete for contracts and orders to produce air-jet components and helicopters in China, India and Malaysia. Furthermore Bouncken et al. (2015) categorised the objectives of cooperation into five further groups:

- Efficiency,
- Market Power,
- Market Exploration and Development,
- Innovation and
- Internationalisation.

These scientific classifications can be found on the horizontal and vertical levels. This indicates in which economic sector and at which level of the value chain the companies are active and operate. In horizontal interorganisational cooperation, two companies at the same level of the value chain work together to develop, produce and bring to market a new product that will compete with other competitors' products. Based on previous research, it can be assumed that this type of cooperation can significantly improve the joining of competitors in terms of sustainability goals and create high synergies. Therefore, it can be assumed that horizontal interorganisational cooperation has a positive impact on future innovation (Park et al. (2014)). Significant research on the horizontal level on creating new markets or improving the company's position in existing

markets includes the study by (Ritala and Hurmelinna-Laukkanen (2009), as companies can achieve a better competitive position by improving their capabilities and using unique, inimitable, non-transferable resources (Quintana-García and Benavides-Velasco (2004)).

If a merger of companies from other sectors takes place, they are active at a different level of the value chain and cooperate vertically. This can be customer and supplier cooperation and can be observed increasingly. This is because the relationship between the supplier and the customer is becoming increasingly important. Nowadays, a supplier is seen as a "real" value-added partner and forms an interface for the customer himself. In the selection of suppliers themselves, a distinction is made between commitment intensity and performance potential. This should enable a better decision on supplier selection. If a merger takes place on a horizontal level, two companies on the same level of the value chain work together, e.g. to create, produce and launch a new product on a market that competes with other products of coepetitors (Le Roy et al. (2022)) . Le Roy even concludes that vertical coepetition does not benefit so much from coepetition. For example, in the product development phase, this leads to less innovative capabilities being developed than horizontal coepetition. Furthermore, vertical coepetition does not create marketing or sales synergies in the sales phase, for example.

In contrast, intraorganisational coepetition can be broken down into competition between individuals, teams (Baruch and Lin (2012)), functional units or business units within the same organisation. At the organisational level, actors must follow the instructions of their organisation and the goals defined by the organisation must be shared. This is an intra-organisational form between cooperation and competition. Although locations within a company can cooperate with each other, e.g. locations within the intra-organisational production network exchange information with other locations,

for example on best practices, and thus learn from each other, these locations also compete with each other, for example on the question of which location should produce new products (Romanowski (2021)). This leads to the fact that operational activities, the division of labour or cooperation can compete and occur within a company. In the case of international corporations, the aim is to achieve an intentional competition between different divisions in order to achieve a better corporate performance. In my work, I apply the network level perspective because I want to examine companies from the same sector that are mostly competitors and at the same time cooperate in terms of sustainability.

3.2. Sustainability

The following section deals with the term sustainability and shows its complexity. In the literature, many terms are associated with this word, which originated as early as the 18th century and has become increasingly important up to the present day. This also shows that the awareness of sustainable action has already found its way into many global conferences and that the pursuit of sustainability is increasingly becoming the focus of many countries. This section also deals with consumers and companies, which can also make a significant contribution to sustainability.

3.2.1. Definition of sustainability

Under the title "Wort des Jahrhunderts: Formel fürs Überleben" (Formula for Survival) is published in 1995 in a Spiegel Spezial (Spiegelverlag) sustainable development was named as the new buzzword of the environmental movement and prophesied that it would prove to be the key word of the 21st century. However, it was not only in the 2000s but already in connection with the use of wood that Hans Carl von Carlowitz described this term at the beginning of the 18th century, in which he called for a constant and sustained use of the forest.

Whether in business, the media or academia, the term sustainability has become part of our vocabulary in recent years. What is sustainability? The answer to this question is not only complex, but is also complicated by different terminology that is often associated with the environment, climate change and resource conservation. And if this is not broad enough, sustainability is also associated with the manufacture and production of goods, energy consumption, environmental and climate protection management. The term is used by a variety of actors: such as Friday for Future, energy companies, food producers, the automotive industry, ministries, managers and consumers. Various definitions can be found in the relevant literature on sustainability issues. These mainly refer to different aspects of sustainability. Pufè (2017) often formulates the definition in connection with economic approaches, as follows: "Sustainability means not generating profits that then flow into environmental and social projects, but generating profits in a way that is already environmentally and socially compatible." Another attempt was made by Herman Daly (former Senior Economist of the Environment Department of the World Bank). He also took an economic view. In his view, the consumption of materials and energy should be limited and the world population stabilised. As a result, he listed four essential features that he believed should be part of a definition of sustainability. These characteristics include:

- the rate of depletion of renewable resources must not exceed the rate of regeneration,
- emissions must not exceed assimilative capacity,
- consumption of non-renewable resources must compensate for a corresponding increase in the stock of renewable resources, and
- technological progress must increase material efficiency instead of material throughput (Hardtke, A./ Prehn, M. (2001).

If one follows the simplest principle by consistently translating the word "sustainability" into German, this word is composed of "nach" and "haltig". The logical consequence is that this word means "effect that lasts for a long time". And this also corresponds to one of the most common definitions for the term sustainability, which was formulated from the Brundtland Report of the United Nations in 1987. This states: "Humanity is capable of sustaining development, that is, ensuring that it meets the needs of the present without compromising the ability of future generations to meet their own needs." (Hardtke, A./ Prehn, M., 2001)). Hauff translates this as follows: "Sustainable development is development that ensures that future generations are not worse off in meeting their needs than those living at present." (Hauff, 1987).

Due to the multitude of terms, numerous scientific considerations and definitions, the term has developed a strongly interdisciplinary character. It turns out that depending on the origin of the definitional approach, different focal points are addressed. In research, two different strands of research have emerged. They focus either on ecological or economic perspectives. Regardless, most definitions include the balanced use of resources to ensure the continuity of an economic or ecological entity. In summary, the term "sustainability" does not have a simple clear definition, but is rather a result of numerous definitional approaches that take into account the different elements of sustainability. However, the following conclusion can be drawn from an ecological as well as an economic point of view:

1. sustainability is oriented towards the present and the future.
2. resources, such as tangible/intangible goods, economic/ecological units are protected, especially if they are non-renewable.
3. The continued existence of a reference object is to be ensured in the short and long term.

Sustainability can thus be understood as a form of ecological and economic action that is intended to ensure comparable or better living conditions for present and future generations by carefully applying and appropriately protecting the element necessary for this. Sustainability focuses on environmental, economic and social aspects (Lexikon der Nachhaltigkeit (2023)).

3.2.2. Emergence of the sustainability principle

The origin of the sustainability principle goes back to the 18th century, Carlowitz's forest management principle. Already at that time, Carl von Carlowitz called for "a steady and sustained use of the forest." It was used as the most vivid metaphor to explain the sustainability principle: Trees that are cut down must be replanted so as not to deplete the resource base - and thus the economic base. If you cut down all the forest, you have a lot of wood in the short term, but little over the next decades. (Pufé, 2017)

It was not until 250 years ago that Dennis Meadows and his team of researchers made their decisive contribution. The report "Limits to Growth" in 1972. Based on a computer simulation, it showed the deterioration of the planet if humanity did not become more resource-efficient. The report is the origin of the beginning of the more recent scientific debate on sustainable development and called for a new "world economic policy".

In the following period, politics and civil society in particular took up the resource-economy principle again, also under the awareness of the "Limits to Growth" report. During the 20th century, the world community's awareness of environmental pollution, overpopulation, poverty and resource depletion increased, leading to the first international conference on nature conservation. Public and political interest in conservation issues continued to grow in the mid-1970s, beginning with the adoption of binding regulations between states to protect the environment, such as the Washington Convention on

International Trade in Endangered Species of Wild Fauna and Flora. This made the problems more specific and the goals more concrete. The historical precursors that shaped the image of sustainability include the "Brundtland Report" (Brundtlandreport (1987)), the "Rio Summit", "Agenda 21" (Vereinte Nationen (2023)) and the UN Millennium Goals. In 1983, the United Nations founded the so-called World Commission on Environment and Development (WCED), an independent commission of experts in Geneva. The reason for writing this Brundtland Report and founding the Commission at that time was the realisation that the quality of the environment worldwide was being significantly affected and rapidly deteriorating due to human economic activities. It was the time of the greenhouse gas. The change in emission levels led to the accompanying climate change. The world's population was also growing, increasing the pressure on available resources. The aim of the report was to provide a perspective report on "long-term sustainable development on a global scale by 2000 and to make recommendations on how environmental concerns can be translated into greater cooperation among developing countries and among countries at different stages of economic and social development, leading to the achievement of common and mutually supportive goals that take into account the interrelationships between people, resources, environment and development, including to consider ways and means by which the international community can deal more effectively with environmental concerns, and to help establish common understandings of long-term environmental problems and the corresponding efforts required to successfully address the problems of environmental protection and enhancement, as well as a long-term agenda for action in the coming decades and aspirational goals for the global community". to elaborate.

The official title of the report was "Our Common Future". (Brundtlandreport, 1987)but more commonly known in the local literature as the Brundtland

Report (Brundtlandreport (1987)). The origin refers to the name of the chairman Gro Harlem Brundtland. The aim of this report was to give recommendations for action for sustainable development. The merit of the Brundtland Report at that time was to have brought the report of sustainable development to the public for the first time as a global uniform guiding principle. The report was the first to state that global environmental problems are mainly caused by human consumer behaviour. The perception of the problem and the resulting approach to solving it led to a strategy that brought together development and the environment and thus coined the term "sustainability". This resulted in the definition: "sustainability" = "environment" + "development".

The UN report, the so-called Brundtland Report (Brundtlandreport (1987)), was followed by the UN Conference in Rio in 1992 . The legendary Rio Conference. On the basis of the Brundtland Report, which was considered by the UN General Assembly in 1989, it was realised that there was an urgent need for action at the international level. The proposals and demands of the need for action called for at that time were to be translated into binding treaties and conventions. A total of 178 states took part in the conference, the aim of which was to deal with development problems in an environmental context and to set the course for sustainable development worldwide. A total of six documents were agreed upon, which promoted the formal legal anchoring of sustainability. Not only were the documents signed, but also the "Agenda 21" (Vereinte Nationen, 2023) was launched, which was unified as a United Nations action programme. Agenda 21 comprises a package of measures consisting of 40 chapters divided into four sections. 1. social and economic, 2. natural resource management, 3. empowerment of major groups and 4. ways of implementation. Kuhn et al. (1998). The package of measures primarily served to encourage international organisations and national governments, as

well as all other political levels, to act in accordance with these goals. The successor agenda is the so-called "Agenda 2030", which came into force on 1 January 2016. This is explained in more detail in 2.2.3.

Another milestone in sustainability was the United Nations Millennium Conference in September 2000 (Vereinte Nationen, (2000), when 189 countries adopted the Millennium Declaration. It defined four programmatic, mutually influencing and interdependent fields of action for international politics. The most important goals were peace, security and disarmament, development and poverty reduction, protection of the common environment, human rights, democracy and good governance.

Eight international development goals were later derived from the Declaration, the Millennium Development Goals (Köhler (2015)) (2023)The main concern was to secure the global future and thus ensure sustainable development worldwide.

3.2.3. Models and concepts of sustainability

The term ecological sustainability has already been mentioned in the foregoing. However, sustainable development requires two further levels, economic and social sustainability. Whereas in the past profit-making alone was the entrepreneurial goal and thus the supporting pillar of any project, this has been supplemented by the ecological pillar due to resource scarcity and environmental pollution. Against the background that not only employees are affected by environmentally damaging business activities of companies, but also numerous internal and external actors such as the social environment, communities and developing countries, the social pillar was added. The model already emerged in the 1990s. The Brundtland Report of 1987 gave particular importance to the model based on three pillars, the so-called "three-pillar model", which regards the three dimensions mentioned as equally important pillars of sustainability. They were used for the first time at the World Summit

in Johannesburg in 2002 as a yardstick for sustainability in international treaties. However, the so-called "one-pillar concept", which focuses solely on the ecological perspective, should also be mentioned. Furthermore, the scientific literature refers to a "four- and multi-pillar concept" whose models include cultural and institutional issues in addition to the three pillars of ecology, economy and social affairs.

The three-pillar model of sustainable development is based on the idea that sustainable development can only be achieved through the simultaneous and equal implementation of ecological, economic and social goals. Only in this way can the ecological, economic and social performance of a society be ensured and improved. The three aspects are thus interdependent. The "three-pillar model" was trend-setting for sustainable development, as it takes into account the mutual relationship of the respective stakeholders from an ecological, economic and social perspective. Nevertheless, the three-pillar model is partly controversial among experts. Critics complain that above all it can only be applied to a limited extent and that only few practical consequences can be derived from it. In a report by the German Advisory Council on the Environment in 2002, the Council denied the three-pillar model its orientation function because it degenerated into a "three-column wish list" in which every actor could enter his or her concerns. Nevertheless, this pillar model has contributed significantly to the understanding of sustainability. It makes clear that all three foundations are needed for sustainability and that they are interdependent. Nevertheless, there are fundamental considerations that, with an appropriate balance, one pillar can also provide sufficient stability. For this reason, two additional dimensions have developed, the intersection model (Fig. 5) and the sustainability triangle (Fig. 6).

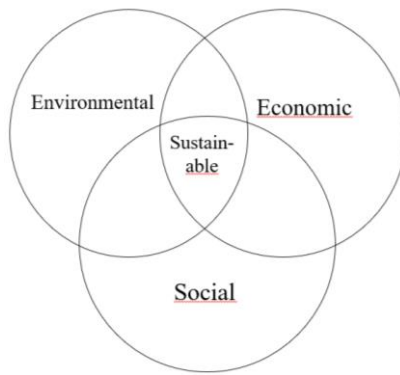


Figure 5: Intersection model (own presentation based on general literature)

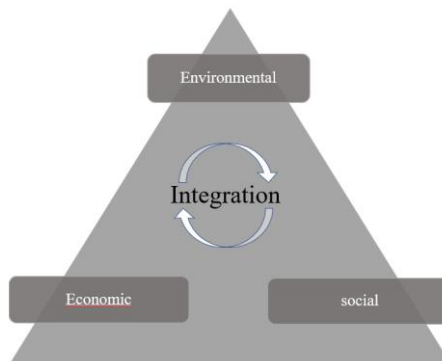


Figure 6: Sustainability triangle (own presentation based on general lit.)

In the intersection model, the three dimensions are represented as overlapping circles whose common intersection is sustainability. In the sustainability triangle, on the other hand, the three thematic areas are combined to form a whole. In both of the above-mentioned forms of representation, none of the three pillars is dispensed with, but only presented differently. However, the content of the model is better represented, because holistic sustainability is achieved through the interaction of all three levels. As a result, the models hardly differ from each other, as the concept of sustainability is divided into the areas of economy, ecology and social affairs and a thematic equality of the three levels is strived for.

In connection with the topic of sustainability, terms have emerged in the past that often cannot be explicitly distinguished from one another, but do have accentuating differences. However, these are also part of the understanding in relation to sustainability and describe certain subject areas that are also important for a scientific presentation and are in the context of companies. In addition to the term sustainability, the terms corporate sustainability, corporate social sustainability (CSR), corporate governance, compliance and corporate citizenship are mentioned in the literature, which can be assigned to the superordinate term "responsible corporate action" and thus already refer to the organisational context. Due to the focus of my topic, these terms are explained below. Although its origins date back to the beginning of the twentieth century, the first reference to Corporate Social Responsibility (CSR) was made in the Green Paper "European Framework for Corporate Social Responsibility" (Europäische Kommission (2001)) actual attention. CSR encompasses corporate social responsibility in the sense of sustainable economic activity that goes beyond legal requirements - i.e. it describes a voluntary contribution to sustainable development. CSR is often also referred to as corporate social responsibility and encompasses the characteristics of three-dimensionality (economic, ecological and social sustainability) and is based on voluntarily carrying out sustainable development and adherence to regulations on responsible corporate management (corporate governance) and legal provisions (compliance) as well as the regular exercise of stakeholder dialogue (Beile et al. (2010)). Corporate citizenship (CC) should also be mentioned alongside the terms CSR and sustainability. The academic literature refers to the social commitment of companies that go beyond their actual business activities (Habisch et al. (2008)). In addition to social support, these also include cultural and environmental contributions. These include, for example, solutions or support for social concerns by the companies themselves in the form of financial support or employee commitment or networks that are

carried out together with external partners. Looking at all three concepts, sustainability, CSR and CC, they are closely linked to stakeholder needs. Depending on the "three pillars" theory, CSR is assigned to the social pillar and CC additionally to the ecological and, depending on its characteristics, also to the economic pillar.

3.2.4. Current development, trends and orientation

Two hundred years later, climate change is arguably the greatest challenge of globalisation, along with the current global pandemic, energy crisis and related economic crisis. Since the Rio Conference in 1992, the United Nations has been trying to create a framework for climate protection. Since then, a multitude of environmental agreements and measures have emerged. The associated access to natural as well as social resources, to knowledge, trade flows, centres and services decides between rich and poor. This results in a need for further action by the United Nations, so that in September 2015 a successor framework was again set for the Millennium Development Goals (MDGs), which expired in 2015. In negotiations with 30 UN member states, a post-2015 agenda with 17 Sustainable Development Goals (SDGs) and 168 sub-goals was agreed together with the UN Global Compact, the Global Reporting Initiative (GRI) and the World Business Council for Sustainable Development (WBCSD). The SDGs are thus another outcome of ongoing efforts to create a framework to promote sustainable development at the global level. The aim is to create a new orientation framework for global development and environmental policy in order to further promote sustainable development in the next 15 years (until 2030). Businesses, as actors, play a key role in enabling sustainable development, as they make extensive use of natural and social resources through the production and provision of goods and services. Current environmental problems such as wastewater, air emissions, soil pollution, ozone layer depletion, global warming and

deforestation can be seen in large part as the result of the negative impact of business on sustainability (UN Environment 2016 Annual Report). Especially the merger of competitors due to this problem, one can see the importance of this issue.

The Paris Agreement (2015) thus sends a clear signal. All states are held accountable. With regard to stricter environmental laws and social regulations, nations, organisations, companies and households that apply sustainability principles are currently at a clear advantage. In the future, governments will have to ensure that these are implemented in both ecological and human terms, and companies, which are already facing globalising and intensifying competitive pressure, will have to rethink their business models in terms of raw materials, employees and innovation. In order to continue to compete successfully in the competitive market, they need to renew their business models and strategies based on sustainable development. From an economic point of view, sustainable development is first and foremost about securing the basis of life and production. This indirectly justifies the claim of sustainable development to preserve the environment globally and permanently and to develop and stabilise the economic and social system on this basis. The goal of economic sustainability is to strengthen economic power in order to achieve the maintenance of a sufficient or desired quality of life over time. The strengthening of economic power can be promoted by a positive development of innovations, fixed investments, labour productivity and expenditures for research and development. However, this requires a rethinking of existing production and consumption patterns that are classified as unsustainable.

2.2.5. Corporate sustainability

Globalisation, economic crisis, financial crisis. Tighter legislation, a shortage of skilled workers, changes in consumer and demand behaviour. Scarcity of

resources, climate change, the rich-poor divide and consumer behaviour - these aspects are forcing companies to rethink (Pufé, 2017).

For this reason, the issue of sustainability in companies has become more important than ever in recent times. It has evolved from a forced eco-topic imposed by politicians into a future potential for economic growth. Hardtke points out that the importance of these issues can vary from industry to industry and company to company, depending on the respective agenda. For example, the energy sector and the mineral oil industry are currently focusing more on social responsibility, whereas the consumer goods industry and the production-intensive sectors are primarily putting material and resource efficiency at the forefront of their activities (Hardtke, A./ Prehn, M. (2001)).

The management consultancy Roland Berger (2022) already pointed to a pioneer in sustainable purchasing and supply chain management, a German manufacturer of sports equipment (Trigema), which actively tracks its entire supply chain and does so together with its competitors. By doing so, it strengthens its own corporate and brand identity towards its consumers, and promotes the resilience of its supply chains. Another example of how to make a difference in sustainability is shown by two large French companies: They signed a polymer recycling partnership to reach their target of 30% recycled content in car interiors. Although cosmetics manufacturers and Sorting goods producers, with their correspondingly sensitive target groups, are already on the rise in terms of sustainability, more and more corporate sectors are also addressing the issue, which have so far been reluctant to do so. For example, a German pharmaceutical manufacturer is working on an internal carbon pricing system for all investments to significantly reduce emissions along the supply chain. The company has also joined other competitors in founding the Sustainable Procurement Pledge (SPP), an international, non-profit organisation that promotes knowledge about responsible procurement

practices. One of the founding members of the SPP is a large German consumer goods group: among other things, it has set itself the goal of making all procurement decisions based on the three sustainability pillars of climate friendliness, circular economy and social progress. And last but not least, there are pioneers and also imitators in the IT sector who are committed to reducing the ecological footprint of their data centres.

Although this development is positive, it seems sobering that the majority of companies see sustainability as a priority benefit for their own survival, and not for the survival of the global community. This is not reprehensible, since companies are primarily founded and operated for economic purposes. Nevertheless, insofar as corporate motives speak for sustainable action, there are certain potentials for value creation that are worth mentioning and bring advantages for these companies. In his conceptual foundations of corporate sustainability, Dyllick already refers to political-ethnic and strategic reasons that play a key role in determining whether a company is motivated to act sustainably (Linne and Schwarz (2003)). The strategic competitive reasons for sustainable entrepreneurial action can be derived from Gminder (2002) as follows:

	Measures	Description
1.	Cost reduction	Eco-efficiency principle with material flow and zero-emission orientation leads to environmental relief and cost reduction with possible development of win-win situation
2.	Risk reduction	Preventive analysis and avoidance of security risks, reduction of liability risks
3.	Planning security	Cooperation with competitors, research parties and social stakeholders
4.	Gaining and securing market share	Recognition of differentiation and market potential leads to the acquisition of new and retention of existing customers

5.	Development of new markets, business areas and revenue sources	The use of sustainability-related future scenarios to discover sustainable value chains and open up new business areas and sources of revenue
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Figure 7: Competitive strategy reasons based on (Gminder et al., 2002)

In the future, however, the entrepreneurial challenge will be to continue to operate profit-oriented and profitably under sustainability aspects. Depending on this, this understanding must be expanded to include ecological and social success factors. In addition to economic efficiency, eco-efficiency (economic-ecological efficiency) and socio-efficiency (economic-social efficiency) are two further important parameters in the context of sustainable development.

Eco-efficiency refers to the relationship between economic, monetary and a physical or ecological quantity and thus describes a key figure that defines the relationship between economic performance (value added) and the emissions and environmental impacts caused. (Hauff, 2021) For example, metrics such as value added €/tonne of carbon dioxide emitted or value added €/kilowatt hour of energy consumed. Eco-efficiency thus serves the self-interest of the company when using this indicator. It can save costs for energy and raw materials and thus represents a perpetual innovation and progress in the company. For example, outdated technologies, products and structures are renewed, which ultimately create market advantages and improve the image with all stakeholders, customers and financiers. (Weizsäcker and Seiler-Hausmann, 1999).

Socio-efficiency is also a measure of the relationship between value creation and social harm. (Pufé, 2017) Social damage corresponds to the sum of all negative social impacts resulting from a product, process or activity. Examples of socio-efficiency are value added €/number of personnel accidents or value added €/sick days.

3.2.6. Consumer behaviour as an Main driver of sustainability concepts in companies

Companies are also forced by consumer behaviour to deal with sustainability. In recent times, different patterns of consumer behaviour have been observed, which are changing significantly in line with current developments. Consumers, especially the younger generation, have precise ideas about what sustainability should look like. This is already evident today in their shopping behaviour. When buying, this generation already pays attention to the fact that the company acts socially and ecologically. This purchasing behaviour is evident in the purchase of everyday products, such as food. This purchasing behaviour is not only reflected in food manufacturers, but also in textile companies or drugstore manufacturers. This shows that a company's image is already linked to the factor of sustainability and that the image is mainly determined by just a few factors. These include the quality of the product, economic success and sustainability. The consumer certainly sees sustainability as a possible criterion when making a purchase decision. A study by Ernst & Young in 2021 (EY Future Consumer Index) (Bangemann, 2021) shows that Germans are already well aware that climate change is a fundamental problem. Thus, climate change is seen as the problem by 53 percent of those surveyed. In particular, the production and consumption of goods and services are important to consumers in Germany at 30%. The global average is comparatively 23%. However, plastic waste is of greatest concern, at 65 per cent in Germany and 73 per cent globally, ahead of climate change. German consumers are also particularly concerned about combating the consequences of climate change (38%) (global 28%), promoting sustainable use of ecosystems and biodiversity, and responsible production and consumption of products and services. This sensitivity is also noticeable in purchasing decisions. Thus, a large majority of German consumers pay attention to the sustainability and environmental impact of a product when

buying it. When it comes to purchasing decisions, it was determined that fresh fruit and vegetables as well as packaged foods are at the top of the shopping list of sustainability-conscious consumers with 83 and 81 percent respectively. They are followed by cosmetics and clothing. A similar study was conducted by Deloitte (2022) in Germany with 1500 participants over 18. Surprisingly, a trend emerged regarding prices. While the awareness of sustainability continues to increase, the willingness to accept corresponding price premiums really collapses. While 67 percent accepted higher prices in the survey in 2021, only 30 percent did so in 2022, and only 24 percent in the non-food sector. The main influence of this opinion was increased energy prices due to the Ukraine conflict and inflation, which recorded 1 over 10% at the end of the last quarter. Against this backdrop, consumers' willingness to pay more for sustainability is largely exhausted. But there is much to suggest that this development can just as quickly turn into the opposite as soon as economic conditions are more positive again. In the current context, manufacturers and retailers should therefore say goodbye to the idea that sustainability necessarily goes hand in hand with a significant price premium. For example, regional production can improve the cost structure.

3.3. Influence of sustainability on competition

In the preceding section (Chapter 2.2.6), the consumer contributes significantly to competition between companies. As early as 2001, Hardtke/Prehn also noted that the sustainability approach could also open up new paths to faster growth and greater profitability for companies that are economically more oriented towards growth targets (Hardtke, A./ Prehn, M. (2001)). Against this background, a paradigm shift is emerging. Companies are increasingly aligning their value chains in a sustainable way, differentiating themselves through changed product and service offerings, further developing their success mechanisms and changing entire markets.

Companies that ignore this business trend today must ask themselves to what extent their core business can still be competitive in the future. From the preceding literature research, the assumption can thus be made that no conflict need arise between competition and sustainability - on the contrary: competition, as an organising principle, regularly serves the common good. Competition drives providers in markets to think about how attractive offers can win new customers or retain existing customers. (Berlin: Stiftung Marktwirtschaft, 2022). According to the study by Stiftung Marktwirtschaft, competition can take place through low prices, quality promises, innovative products, good service, long opening hours, attractive locations, convincing advertising and many other things that customers potentially value. If customers value climate-friendly production or good working conditions for workers or "fair" payment of suppliers such as producers, companies can gain competitive advantages by offering exactly this and being transparent.

In my research, I was able to establish that sustainability can be an entrepreneurial opportunity for start-ups and for established companies. Sustainable business models and innovations are an important way to differentiate oneself from the competition. In particular, companies need to decide in which areas sustainability is particularly worthwhile. Consumers must use their tight budgets as effectively as possible to achieve maximum sustainability. A prerequisite for both is the highest possible transparency beyond the value chain. Similarly, anchoring positive contributions to the environment and society makes it easier to build a corporate and employer brand compared to non-sustainable business models. (Leal Filho, 2019).

But how is this reflected in cooperation with competitors? Partnerships with other organisations play an important role in most companies' business models. These include strategic alliances between non-competitors, strategic partnerships between competitors (co-opetition), joint ventures to develop

(Porter and Kramer, 2011) new business, and partnerships between supplier(s) and customers. As many sustainability issues are industry-specific rather than company-specific (Etzion (2007)) a company is often unable to effectively address such issues on its own (Berkowitz and Bor (2018)). This brings to the fore collaboration with other representatives of the same industry facing similar issues. This plays out at the horizontal level of cooperation. Such interactions may include, for example, pooling resources to drive their inefficient use through participation in voluntary programmes, mutual innovation, and development and/or adaptation under industry-specific standards and requirements for certification of products (Helfen and Sydow, (2013)); (Planko et al. (2019)). This can lead to better resource use, greater efficiency through economies of scale and even dematerialisation of some processes (Christ et al. (2017)); (Hahn et al. (2015)).

As a result, it can be concluded that sustainability is a long-term process by companies and requires a strong level of in-commitment, transparency and environmental, economic and social performance targets (Manzhynski and Figge (2020)). To achieve this process, a transformation of the technological, social and economic patterns of production and consumption of goods and services (Carrillo-Hermosilla et al. (2009)) is required. In particular, co-operative interactions are becoming more frequent among companies, insofar as they are active in the field of R&D. These companies can thus take risks and reduce costs when innovating. These companies can thus reduce the risks and costs of innovation (Gnyawali and Park (2009)). This also applies to companies that have a shorter product life cycle (Quintana-García and Benavides-Velasco (2004)) or have a certain technological complexity (Bouncken and Kraus (2013)).

4. SELECTION OF THE RESEARCH METHOD

The chapter describes the research approach and research design of this dissertation. It explains and reflects on these in order to explore the research objectives. The motives and rationale for the research approach are considered in a holistic way that includes the description of the methods. As the literature review shows, "coopetition" and "sustainability" are understood as a multidimensional concept and that a clear understanding is lacking in current research on how competitors integrate the dependence on sustainability goals into their decision making. By examining competitors' subjective ranking of sustainability considerations and traditional cooperation, the study aims to identify different perspectives of coopetition actors.

In order to identify the different subjective perspectives, the Q-methodology is used as a research strategy. It provides a basis for systematically exploring a person's subjectivity, point of view, opinion, belief and basic attitude. It provides insight from different stakeholder perspectives to inform research replicable results and to support decision makers (Brown, 1994).

4.1. Q-method

While working on the research topic, I gained insights that were based on objective, professional opinions due to my work environment, but were not sufficient for a large-scale research study. This was because an already conducted survey, which was broadly based and included a rational questionnaire survey, did not lead to a representative evaluation due to an insufficient number of addressees with decision-making responsibility, such as senior executives with managerial responsibility or managing directors of medium-sized or large companies. For this reason, an approach had to be chosen that could reliably prove my hypotheses. Already in the past, my co-supervisor Professor Sándor Kerekes gave a lecture on a special method that maps a spectrum of opinions. A method for quantifying the subjective

impressions of any situation, -the Q-method. The Q-method aims to provide insight into the perceptions and feelings of individuals at a level where comprehensive social forces operate within individual agency (Heinze (2020)). The basic principle is to find the structure and form of subjective opinions that cannot be proven! The Q-method only deals with subjective opinions, and although these are typically not provable, it can still be shown that they have a structure and form (Kerekes (2021)). This is because the Q method assesses a relatively large number of statements with a relatively small number of people involved in the observation. The correlation coefficients calculated by the method represent the correlation between the individuals (Comrey and Lee (1992)). Practical experience in using the Q method proves that there are only a limited number of different views on a given topic (Brown (1993)). Thus, if the set of statements, the "Q-set", is well constructed (i.e. it contains the widest possible range of opinions on the topic under study), we should be able to identify a wide range of different views in public discourse, using as few as possible 20-60 statements (Kerekes (2021)). Therefore, this evaluation procedure is very suitable because this study requires collecting information about individuals' beliefs and perceived experiences. This method collects valid information, i.e. participants' views are faithfully reflected, as well as minimising the potential for researcher bias that can arise from the analysis of traditional questionnaire and survey methods. For this reason, the Q method has been used to study patterns of opinion in groups of people on dozens of topics. Its use in the field of environmental studies, for example, has been steadily increasing in the past. In the fields related to environmental studies, Q studies have been published on many topics. Among them: "Assessing public participation in environmental impact assessments" (Simpson et al. (2020)), "Creative destruction of the circular economy. The discourse and attitudes of doctoral students" (Kerekes (2021)) or "Environmental policy" (Addams and Proops (2000)). The Q-Method was

thus identified as suitable to achieve the required result of identifying the underlying motivational influences on voluntary associations among competitors that are environmentally active and have set targets for sustainable development.

4.1.2. Theoretical foundations of the Q-Method

The Q-Method is a semi-quantitative discourse analysis technique that analyses underlying patterns or meanings to explain perspectives that exist on a particular topic (Ramlo (2016)). The method is used to study patterns of opinion between groups of people on many topics (Webler et al. (2009)).

The Q-method is hardly known in the tradition of German-language research. It sees itself as an interface between the qualitative and quantitative methodological approach. This method is used in particular to record complex opinion patterns, attitudes and value orientations from a subjective perspective. The method was developed by William Stephenson in the 1950s at Oxford University. He was a psychologist (and also a physicist) interested in finding new ways to study people's beliefs and attitudes. Stephenson (1953)). The original approach was described by Stephenson as early as 1936. In use, the items of the CQ set are arranged by the assessor in such a way that they characterise the person being assessed. That is, the items "are placed in an order corresponding to representativeness [or importance] to the person, those that are most characteristic of him being given high scores, while those that are least characteristic are given low scores" (Stephenson, 1936). The best-known expert on the Q-Method, and one who is still alive today, is Stephen Brown of Kent State University. In 1980 he wrote an authoritative book on the science of the Q-Method and continues to be actively involved in all aspects of Q research. Brown's 1993 Q Primer (Brown (1993)) provides excellent methodological depth and quotes extensively from the original work

of William Stephenson. Stephen Brown believes that Q is able to reveal the structure of people's beliefs and opinions.

The Q-methodology should be seen in contrast to the traditional R-methodology, which is based on test-theoretical assumptions and analyses categorical systems in relation to each other. It differs in that it is based on a specific survey procedure and uses an evaluation procedure that compares people with each other with the aim of creating types. (Müller and Kals, 2004). Q and R approaches have many differences. Stephenson argued that there is no data matrix to which both the Q and R approaches can be applied. However, the R and Q approaches can be distinguished quite easily when it comes to how factor analysis is conducted. In R research, respondents are the subjects and questions are the variables. R researchers look for what are called patterns in responses across variables for each subject. They investigate whether the rating of one variable is related to the rating of a second variable for the same person. In Q research, subjects and variables are basically reversed. So the "subjects" of a Q study are the Q statements and the "variables" are the people - more precisely, their Q sorts. In Q research, patterns in the variables (e.g. people's Q sorts) are searched for each subject (e.g. Q statement). It is investigated whether the expression of one variable (a Q sort of person 1) is related to the expression of another (a Q sort of person 2) for the same Q statement. Participants sort the statements according to how these statements fit with their beliefs and understanding. The Q-Method looks for the patterns that emerge in the participants' Q sorts. When patterns are found, it indicates that there are intersubjective orders of beliefs that are shared by people. This leads to the Nation of social perspectives (Addams and Proops (2000). Basically, the Q-Sorting method is subject to certain technical limitations, because the Rater has to Cassidy the Q-scores into a certain number of Category and (most Category) with a certain number of points in each Category (Block, 1961). The

aim is to form types of subjective views on a subject area. For it is not the Proportion of survey participants of the same opinion on certain topics that is examined, but the way in which public discourse can be typed. The results do not show with whom one agrees, but what causes the agreement and which statements do not connect the respondents. Thus, the commonalities in the subjective constructions of the individuals as well as their differences are to be shown. This means that the Q-method is not concerned with the representative survey of types, but rather with generating existing topical opinions. In principle, it can be assumed that the Ratio between the number of statements and the number of people included in the study is Ratio 2:1. Practical experience and the literature also show that with 20-60 statements with a group of participants of 20-30 people, the stability of the correlation can already be sufficient and, more Category, that with these statements the different Position can be described in a variety of ways (Brown, 1996). The basic prerequisite is that the set of statements, the so-called "Q-set", the spectrum of opinion, Covers the subject area under consideration as far as possible in order to examine a broad spectrum of divergent Position in public discourse with the help of up to 20-60 statements. The Q-Sorting technique serves as the instrumental basis of the Q-method for determining the spectrum of opinion.

The preparation of the Q-methodology study is divided into seven steps:

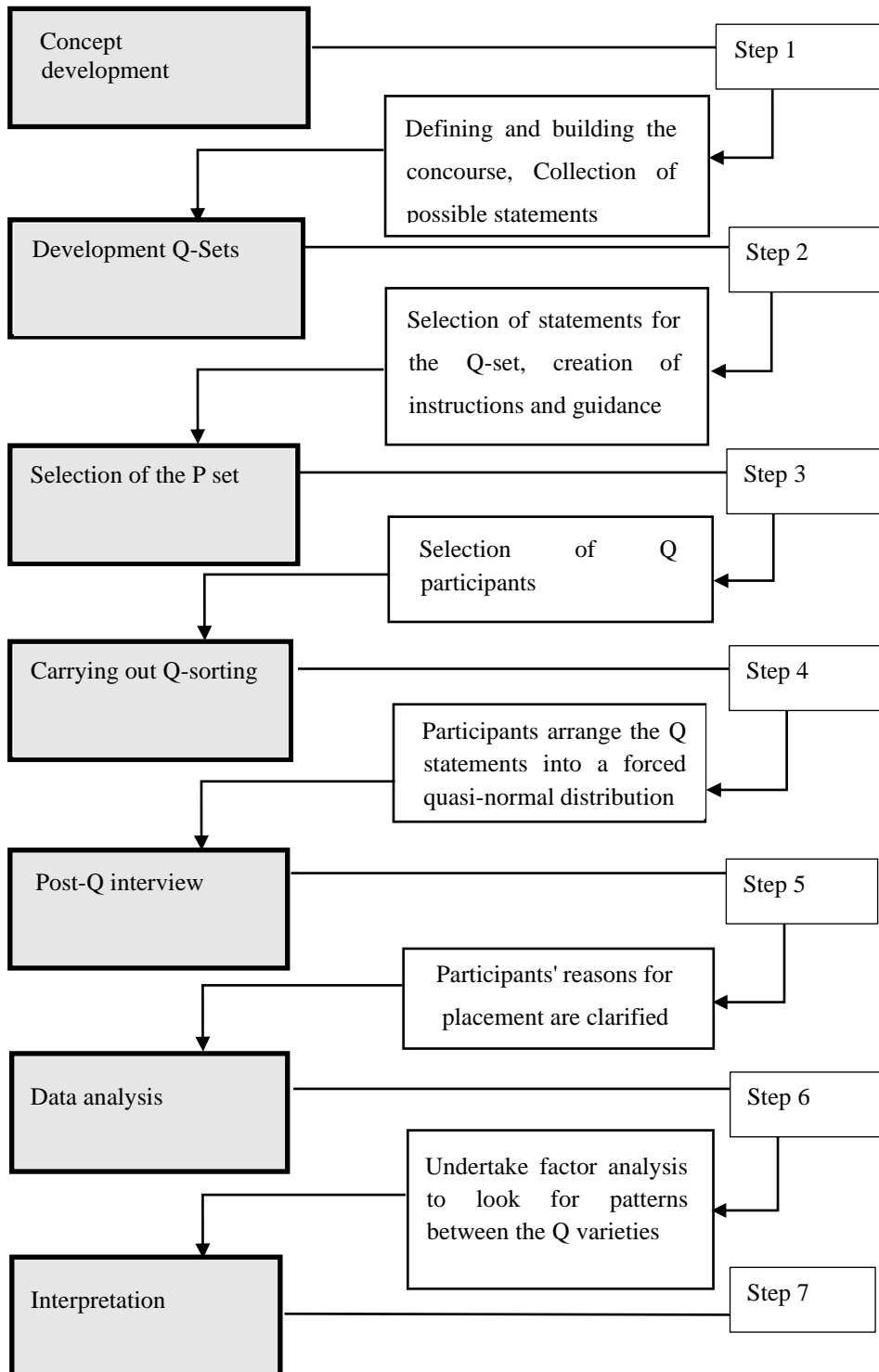


Figure 8: Phases of the Q-methodology study based on (Brown 1980)

4.2. Concept development

To begin with, a series of statements are collected and then developed that reflect the range of perceptions about the research topic. This is done either through primary or secondary data. A distinction is made between two types: naturalistic and prefabricated statements. The former can come from respondents' oral or written communication, e.g. questionnaires, interviews and focus groups, while the latter can come from prefabricated utterances from sources such as existing print media (newspaper articles, magazines, public records, websites) (McKeown and Thomas ((2013))). Furthermore, both practical experience and the literature (Steven R. Brown 2000) have shown that 20-60 statements can be sufficient and, more Category, that these statements can be used to describe the different Position in a variety of ways. Too many statements would be detrimental to the application of the method because they would require so much time from the people involved in the study, which they cannot spend on this task, and possibly distort the attitudes of the participants. According to previous studies, analyses are usually conducted with 20-60 statements involving 20-30 people. Previous experience has shown that there are only a limited number of dissenting positions on any given topic (Brown (1993)). Thus, if the set of statements, the so-called "Q-set", is well structured, we will probably be able to map a broad spectrum of dissenting positions in public discourse using these statements.

The starting point for my formulation of the Q-Sort is based on literature research and a survey conducted in Advance in May 2022 with 23 managing directors, CEOs and senior executives (CEO Airport Austria, Hübner Consulting, etc.) who run their own companies or were part of a corporate group. I also used the opportunity as a member of the group "Kookkurrenz - Kooperation und Wettbewerb in der Plattform-Ökonomie" (Cooperation and Competition in the Plattform Economy), which was initiated by a member of

the BOSCH Group. These experiences enable me to formulate the corresponding statements.

4.3. Development of the Q-sets

In the second stage, statements are developed from the discourse, i.e. the development of the Q-sets. Furthermore, the conditions and statements are created. The selection of statements is essential for the Q-set. In particular, care must be taken to select a variety of viewpoints and to avoid overlaps. Therefore, the Q-statements that were included in the first stage are reviewed again in this stage. For my study based on the Q-Method, taking into account the mathematical assumptions of the factor analysis method and the experience with the Q-Method, about 39 statements are needed that meet the requirements of the method and adequately represent the scope of the problem under study. Therefore, about 60 statements were created in advance, which went through further stages to eliminate ambiguities and repetitions. This is important as it ensures the representativeness and completeness of the statements so as not to blur the focus of the study and reduce researcher bias. Due to the complexity that affects a competition, especially with regard to sustainability, it was necessary not only to create the questions from the perspectives of managers and companies, but also to include consumers in order to obtain an overall assessment. Because it already became apparent during the literature research that the motivation to cooperate with a competitor is also based on the attitude of the consumer or the customer and thus a customer loyalty is sought by the company. If we look at the younger generation, the literature shows a change in the basic attitude towards a brand, for example. This has already been explained in 2.2.6 Consumer behaviour. It was also important to consider state intervention when creating the questions. In 2.2.5. corporate sustainability, content was already listed as to why companies are becoming more sustainable. The eco-topics imposed by politics

were also referred to. Therefore, it was also necessary to include this in the creation of the questionnaire.. From these statements collected in the preliminary rounds, the following 39 statements finally remained after consultation with experts, which, according to the experts, reflect the public discourse on cooperation with competitors and aspects of the sustainability goals well, which can be taken from Table 2.

1. Co-operation reduces competition, reduces efficiency and therefore has a negative impact on sustainability.	2. Competition encourages innovation, while cooperation tends to slow down innovation...
3. Cooperation between competitors is only feasible in the short term. In the long run, all market players tend to be free-riding.	4. Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful...
5. Consumers have little impact on the sustainability performance of businesses.	6. People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.
7. Companies ensure transparency of their activities along the entire supply chain.	8. The UN 2030 Sustainable Development Goals encourage cooperation between competitors.
9. Retailers and consumer goods companies work closely together to jointly implement sustainability strategies.	10. the prices of products produced by enterprises that take sustainability requirements into account should be cheaper than those produced in the conventional way.
11. The regulator should oblige companies to enforce their social and environmental standards through written contracts along the entire supply chain.	12. When competitors merge, they do so mainly to save costs.
13. Increasing competition and a complex and uncertain business environment make cooperation with competitors an essential strategic tool.	14. Companies will be forced to work closely with competitors to meet their sustainability commitments by 2030.
15. Coopetition is primarily about creating new markets and expanding existing ones; improving environmental performance is secondary.	16. Businesses are important economic actors, but their role in achieving global environmental sustainability is not important.

17. The increasing demand for sustainable production and the valuable use of resources in a largely globalised economy strengthens the desire for joint entrepreneurial cooperation.	18. Collaboration offers advantages for companies as they face increasing pressure to integrate the global value chain.
19. Consumer purchasing behaviour has a decisive impact on environmental and climate protection.	20. Consumers tend to see the responsibility for sustainable consumption more as their own and are not aware of the role of business in promoting sustainable consumption.
21. Any dimension of sustainability can only be achieved along the entire supply chain of a product...	22. Consumers are not interested in the sustainability features of products, but in their availability at the right quality and price
23. I would pay more for a product if it met certain sustainability criteria.	24. For international car manufacturers, profit is more important than the environmental impact of their business.
25. When buying a product, it is important to me that it has little packaging and is seasonal and from the region...	26. The more a company contributes to sustainability, the more it can retain its customers...
27. In the future, cars will no longer be status symbols. Young people will see their vehicle as a mobility tool that should not overburden the environment.	28. The sustainability reputation of a car brand is a decisive factor when buying a car.
29. Brand loyalty plays a bigger role when buying a product than actual performance.	30. When buying a product, environmental performance is important to me.
31. Everyone should be able to afford to buy only environmentally friendly products.	32. It is important to me that my manufacturers, from whom I like to buy products, produce in an environmentally friendly way.
33. The goal of companies is to know and understand the customer so well that the product or service fits them and sells itself.	34. A company should certify to the consumer that its products have been produced sustainably.
35. There should be subsidies from the state for the production of sustainable goods.	36. A company that develops a new technology innovation that contributes to environmental awareness should share the innovation with other companies.
37. Start-up companies strive unsuccessfully to innovate because market success fails to materialise	38. People trust local products because of their good value for money.
39. The issue of organic food is overrated because most of the food we eat contains chemicals anyway.	

Figure 9: Q-set statements

Subsequently, these statements were loaded into an Excel file and a corresponding manual and instructions on the procedure for the participant were deposited. A Q-grid (evaluation sheet) was also created in the Excel-based file.

4.4. Selection of the P set

The third stage is the selection of the P-sets. Here the participants are selected for the survey. A large number of participants is not necessary for a Q-method study, because the Q-methodology aims to uncover some important viewpoints that are favoured by a particular group (Watts and Stenner, 2005). Care must be taken to ensure that participants are selected so that they have clear viewpoints on the research topic. (Brown, 1980) Another requirement is diversity of observable demographic characteristics, e.g. age, gender, social class, education, assuming equivalent diversity of opinion (Watts, 2012). For this reason, a deliberate choice was made to include people in the sample who have a high level of information on the topic and can represent the full range of public discourse. For this reason, 23 participants were selected for this study and care was taken to ensure that stakeholders from important interest groups were represented among the Q - participants because they have diverse and well-educated opinions. People with well-educated opinions find it easier to do the Q-Sorting and are likely to do a more robust Sorting. Participants were selected from two different university institutions with work experience and from companies in which they held certain key roles. Attention was also paid to gender distribution. The other characteristics of the participants are as follows: Age ranged from 20 to 65 years. Of these, 30% of the participants were under 30 years of age, 40% were between 30 -50 and also 30% were over 50. The gender is 40% female and 60% male. Further characteristics can be seen in the table below.

Participant	Gender	age	Education	City	Employment	Company size	Sustainability Department
Dirk	male	30-50	University	< 50Tsd	owner	< 10	yes
Florian	male	30-50	University	> 50Tsd	owner	<250	no
Gayane	female	belo w 30	University	> 50Tsd	Employeer	<250	yes
Götz	male	50-70	University	> 50Tsd	Manager	> 250	yes
Judith	female	50-70	University	<2Tsd	Manager	< 10	no
Jürgen	male	50-70	Higher education	> 50Tsd	owner	< 10	no
Karina	female	30-50	Higher education	< 50Tsd	Employee	< 10	no
Phyllis	female	30-50	University	<2Tsd	Manager	> 250	yes
Rene	male	30-50	Higher education	> 50Tsd	Manager	< 50	no
Ruth	female	50-70	Vocational school	> 50Tsd	Employeer	<250	yes
Uwe	male	30-50	University	< 50Tsd	Manager	> 250	yes
Valeria	female	50-70	University	<2Tsd	Manager	< 10	yes
Wolfgang	male	50-70	Vocational school	> 50Tsd	Employee	> 250	yes
Dennis	male	30-50	University	< 50Tsd	Manager	> 250	yes
Ton	male	belo w 30	University	> 50Tsd	Manager	> 250	yes
Tai	female	belo w 30	Higher education	> 50Tsd	Employee	> 250	yes
Plantek	male	belo w 30	Higher education	> 50Tsd	Manager	<250	no
Bakthik	male	belo w 30	Higher education	> 50Tsd	Employee	< 50	no
Ingo	male	50 - 70	University	< 50Tsd	Employee	> 250	yes
Natalie	female	belo w 30	Higher education	<2Tsd	Employee	<250	no
Alexandra1	female	belo w 30	Higher education	> 50Tsd	Employee	<250	no
Manuel	male	30-50	University	> 50Tsd	Employee	>250	yes
Alexandra2	female	30-50	University	> 50Tsd	Employee	< 250	yes

Figure 10: Participants in the Q-survey

4.5. Carrying out Q-Sorting

The fourth stage involves carrying out Q-Sorting. The participants are presented with statements in the form of randomly numbered cards. They then

have to rank the cards on a predefined scale in relation to each other, depending on the extent to which they agree with the respective statement. For now, these cards have to be classified into three groups depending on whether they agree, disagree or are indifferent to the statement. They then rank the statements in relation to each other according to the Category of the rating scale, carefully reflecting on their decisions individually. Participants then rearrange the cards until their Q-range best represents their own point of view.

In contrast to the open distribution method, all cards must be placed in the approach used here (forced distribution method). This has the effect in the decision-making process of manifesting one's own hierarchy of beliefs. The distribution of the statement of all test persons ultimately results in the data basis or correlation matrix ($n \times n$) for the statistical evaluation by means of factor analysis. While conventional factor analyses look for Correlation between variables, the Q-method aims to establish Correlation between the subjective attitudes of the test persons (Watts (2012)).

Q-Sorting took place from November to mid-December 2022. Before starting Q-Sorting, participants were given instructions on how to use the Q-Sorting techniques. They were instructed to sort their packet of 39 statements into three piles. Participants were then asked to sort the piles so that they ranked the statements from most agreed to least agreed. A template forcing a quasi-normal distribution was used for this purpose (see Figure 11). The subjects were instructed to sort the cards along a scale e.g. from "not true for me" (-4) to "true" (+4) according to their subjective view. In the forced distribution method, the number of cards that can be assigned to one of the Category from -4 to +4 is limited: Thus, in our example (Fig. 11), only 1 card can be assigned to each of the Category -4 or +4, two cards to each of the Category -3 or +3, and exactly 6 cards to Category 0, for example (the boxes in Fig. 8 correspond to the number of cards to be assigned). It is crucial that the test persons are

given enough time during this Sorting process to deal with the set of cards and to re-sort them.

disagree			neutral			agree		
-4	-3	-2	-1	0	1	2	3	4

Figure 11: Q-Sorting method and classification

All Sorting templates were cross-checked at the end of the Sorting exercise. Additional personal insights and reflections of the participants were additionally collected to improve the data analysis. Own experiences with the research method showed that the Sorting process is perceived as motivating. Furthermore, it is also possible to now see one's own position towards an object area - such as the "attitude towards consumption" - in a clearer and more differentiated way after processing the Q-sort. Overall, the participants needed about 40 minutes to complete the Sorting, with some faster sorts taking about 20 minutes and some slower sorts taking over an hour.

4.6. Post-Q interview

After conducting Q-Sorting, participants were asked about the reasons for placing the cards on the grid and were asked to express their opinions when conducting the Q-Sorting. In addition, the observations made during the Communicator, the information provided by the participants during the debriefing and the demographic data were taken into account for the final interpretation.

4.7. Data analysis

At the beginning of the Q-analysis, the Q-statements and the Q-sorts were read into the free software programme PQMethod (by Peter Schmolck) and a quasi-normally distributed arrangement was entered into the programme. The programme asks for the maximum number of possible statements per column. This means that it must be specified that e.g. for "-4" a maximum of 2 statements may be placed, for "-3" a maximum of 3 statements and so on. (cf. Figure 2). Once the quasi-normally distributed basic framework has been entered into the programme, PQMethod then allows the Q-statements and Q-varieties of the 23 test persons to be entered and evaluated. A first step in the analysis is to calculate the correlation between the different Q sorts, in other words, to determine to what extent two Q sorts are related to each other. These correlations are stored in R , where the matrix has as many rows and columns as there are Q sorts (Brown (1980)). The study of 23 participants (and thus the same number of Q sorts) was therefore given a matrix of 23 x 23 cells. The Q sorts found each respondent's perspective on the relevant case study. The correlation matrix (Figure 11) shows who among the 'participants' in the sample has a similar opinion and who is the so-called opinion leader. Figure 11 shows the correlation matrix of all participants. It is clearly visible that high correlations are possible, for example between participant 1 and participant 23. It is clear who falls under the opinion leaders, i.e. the so-called experts, in the correlation matrix or who has a similar opinion. Likewise, participant 13 seems to have a clearly different opinion than other participants.

Correlation Matrix between Sorts																								
Sorts	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1 Dirk	100	35	42	12	51	24	30	59	8	15	4	95	-95	29	28	45	95	22	-2	51	31	22	55	
2 Florian	35	100	35	22	1	16	28	28	95	2	24	44	-9	35	27	-22	15	19	20	4	23	39	9	
3 Garyani	42	35	100	-6	22	32	22	36	2	-27	-53	34	-20	22	47	3	7	-9	11	16	52	25	6	
4 Götz	12	22	-6	100	-14	-9	22	-4	2	-7	23	-22	15	-44	-16	-22	13	37	5	4	7	7	-1	
5 Judith	31	1	22	-14	100	12	15	52	16	-2	-54	32	-2	38	4	26	26	22	-23	51	27	12	19	
6 Jegen	24	35	32	-9	12	100	24	24	12	-2	-1	18	-8	20	17	35	41	14	15	-54	33	39	9	
7 Karina	30	28	22	22	15	24	100	19	36	10	21	31	3	18	1	36	30	45	28	3	24	43	59	
8 Philis	59	28	36	-4	32	24	19	100	24	29	11	11	-20	35	37	45	43	-8	-14	47	27	29	28	
9 Rene	8	15	2	2	16	12	36	24	100	37	5	3	-95	18	-25	28	35	5	30	2	16	38	41	
10 Ruth	15	2	-27	-7	-2	-2	10	29	37	100	23	-1	3	5	-18	39	21	5	3	-12	1	5	34	
11 Uwe	4	24	-13	23	-14	-1	21	11	6	23	100	3	26	5	10	5	22	19	18	3	-4	18	10	
12 Valeria	95	44	34	-22	32	18	31	52	8	-1	3	100	-12	32	45	24	31	7	27	31	4	37	28	
13 Waldspang	-36	-9	-20	15	-2	-8	3	-20	-36	3	26	-12	100	-38	-21	-19	15	3	-16	-13	6	-19	-9	
14 Dennis	29	35	22	-44	38	20	18	35	18	5	5	52	-38	100	45	21	32	12	21	12	12	39	6	
15 Tom	28	27	47	-16	4	17	1	37	-25	-38	10	45	-21	45	100	-1	3	-4	26	16	16	20	-15	
16 Tai	45	-12	3	-12	26	35	36	45	28	39	5	24	-19	21	-1	100	48	21	22	13	-4	40	51	
17 Flarek	95	15	7	13	26	41	30	43	35	21	22	31	15	32	3	48	100	25	34	5	5	36	38	
18 Bekdik	22	19	-9	37	22	14	45	-8	6	5	19	7	8	12	-4	21	25	100	22	5	14	14	22	
19 Ingo	-2	20	11	5	-23	15	28	-14	30	3	18	27	-95	21	26	22	34	22	100	-14	-1	19	23	
20 Natalie	31	4	35	4	51	-14	3	47	2	-12	3	31	-13	12	16	13	5	5	-14	100	2	4	18	
21 Alexander a1	31	23	62	7	27	33	24	27	16	1	-4	4	5	12	16	-4	5	14	-1	2	100	20	15	
22 Manuel	22	39	25	7	12	39	13	29	38	1	18	37	-19	39	20	10	36	14	19	-6	20	100	25	
23 Alexander a2	55	3	5	1	19	3	59	28	41	34	10	28	-9	5	-15	52	38	22	23	18	15	25	100	

Figure 12: Q-sorting method and classification

After creating the correlation matrix, a PCA (Principal Components Analysis) was carried out. In the unrotated factor matrix (see Table 3), 8 principal factors were then output. Table 3 is thus the result of the PCA analysis, where the maximum number of factors that can be extracted is eight factors. PCA uses multivariate techniques to reduce and simplify data. In this way, PCA extracts essential information from data tables and also analyses the observable structures of the variables. PCA was analysed on the basis of the eigenvalue. It indicates how many variables can explain a factor. The default value of the eigenvalue is set to > 1 (less than 1 is ignored as no factor can be formed). Therefore, the table below shows only one factor 1 to 8. The number of factors extracted for further analysis met the Kaiser-Guttman criterion (eigenvalue greater than one) (Guttman (1954)) and the criteria mentioned by Webler et al. (2009), although Herrington and Coogan (2011) recommend not discarding factors with an eigenvalue <1, as the importance of keeping or discarding a factor has more to do with its coherence than its eigenvalue.

Table 1: PCA unrotated factor matrix

	1	2	3	4	5	6	7	8
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Dirk	0.7704	-0.1284	-0.3301	0.2861	-0.0026	-0.1416	0.0333	-0.2044
Florian	0.4211	-0.0465	0.5045	0.1515	-0.2653	0.1537	-0.4035	0.2223
Gayane	0.4554	-0.5393	0.2273	0.2083	0.4218	-0.0504	-0.0890	-0.1823
Götz	-0.1260	0.4053	0.1818	0.6815	-0.0387	-0.1912	-0.2372	-0.1440
Judith	0.5088	-0.2797	-0.4965	0.2013	0.0254	0.0845	0.1748	0.4374
Jürgen	0.4570	-0.0212	0.2582	-0.1067	0.4439	0.1972	0.3424	-0.1714
Karina	0.6388	0.4216	0.1599	0.2249	0.1120	-0.1303	0.0808	0.0743
Phyllis	0.7268	-0.2752	-0.3372	0.0294	-0.1194	0.2351	-0.2083	-0.2254
Rene	0.4207	0.4237	-0.0548	-0.2714	0.2105	0.0647	-0.4237	0.3129
Ruth	0.2189	0.4679	-0.3141	-0.3019	-0.0976	0.3959	-0.2688	-0.1668
Uwe	0.1824	0.3522	0.2292	0.2013	-0.5286	0.3022	-0.0732	-0.2655
Valeria	0.6614	-0.3017	0.1265	-0.1286	-0.3506	-0.0572	0.0496	0.0717
Wolfgang	-0.1966	0.2860	0.0147	0.4069	-0.1277	0.5325	0.4112	0.0207
Dennis	0.5684	-0.3123	0.1698	-0.3517	-0.2375	0.1744	0.1607	0.3823
Ton	0.3625	-0.5881	0.3919	-0.0484	-0.2574	-0.0475	0.0830	-0.3067
Tai	0.6071	0.3205	-0.3287	-0.3411	0.0870	-0.1433	0.2101	-0.2323
Plantek	0.6537	0.3440	0.0197	-0.0282	-0.0601	0.1250	0.3339	-0.1030
Bakthik	0.3114	0.3918	0.1451	0.3971	-0.0850	-0.2336	0.2889	0.3421
Ingo	0.2994	0.2648	0.5390	-0.2790	-0.0928	-0.4092	0.0652	-0.0625
Natalie	0.3414	-0.3332	-0.4814	0.3180	-0.3571	-0.2421	-0.1136	0.0383
Alexandra1	0.3794	-0.1981	0.1509	0.3865	0.5670	0.2830	-0.1726	0.0443
Manuel	0.6042	0.1082	0.3435	-0.1684	0.1141	0.0977	-0.1260	0.0942
Alexandra2	0.5919	0.4330	-0.2897	-0.0525	0.1074	-0.2490	-0.1043	-0.0765
Eigenvalues	5.5298	2.7388	2.1299	1.8639	1.5701	1.2412	1.2000	1.0678
% expl.var.	24	12	9	8	7	5	5	5
PQMethod2.35	Coopetition							

The degree of correlation of a Q-sort with a factor is given in the so-called factor scores. This rule states that those factors are accepted that have two or more significantly loaded Q-sorts. In principle, it can be stated: the more factors are extracted, the fewer sorts will show a significant correlation with the individual factors (Herrington and Coogan (2011)).

Furthermore, the Q-Methode should provide information on whether participants show different opinions, i.e. whether they load on different factors. In principle, the Q-Methode is not suitable for drawing conclusions from factors back to individual participants. After all, the primary aim of the Q-Methode is to descriptively investigate the opinion patterns of the individual factors and not those of the individual participants. Nevertheless, a comparison is now ventured to draw cautious conclusions about whether the opinions of participants differ. For this purpose, an analysis with Varimax rotation was then carried out. The factors that can be rotated by Varimax have eigenvalues >1. Varimax maximises the eigenvalue of each factor. Table 4 shows a result

of Varimax rotation. The programme calculated the correlation of each variety with every other variety and extracted a set of non-rotated factors, each representing a common social perspective. Following the guidelines of Webler et al. (2009), which uses 4 criteria to determine how many factors to report, these include: 1. each factor must have an explanatory score greater than 3%, 2. at least two participants must load significantly on the factor, 3. the factor must be of theoretical significance and the results must be logical, and 4. the correlation between the factors must be less than 0.33, meaning that the factors are distinctive, the final set of factors was determined based on four main criteria: Simplicity, Clarity, Distinctiveness and Stability. As a result, the following Tables 4 shows which participants load significantly on a factor. The Q-sorts marked with X are significant and define the respective factor.

Table 2: Four factor solution

Factor Matrix with an X Indicating a Defining Sort				
QSORT	Loadings			
	1	2	3	4
Dirk	0.2154	0.3072	0.7710 X	0.2563
Florian	0.4716	-0.0253	-0.0137	0.4835 X
Gayane	0.5617 X	-0.2672	0.4076	0.2006
Götz	-0.3759	-0.0979	0.0014	0.7149 X
Judith	0.0845	0.1563	0.7689 X	0.0375
Jürgen	0.4506 X	0.1996	0.0355	0.2080
Karina	0.1565	0.4703	0.1429	0.6292 X
Phyllis	0.3591	0.3030	0.7056 X	0.0023
Rene	0.1118	0.6380 X	-0.0483	0.1063
Ruth	-0.1506	0.6513 X	-0.0221	0.0963
Uwe	-0.0247	0.1686	-0.1120	0.4570 X
Valeria	0.6427 X	0.1771	0.3298	0.0884
Wolfgang	-0.4038	-0.1027	-0.0557	0.3310
Dennis	0.7054 X	0.2048	0.1649	0.0806
Ton	0.7206 X	-0.2869	0.1698	0.0530
Tai	0.1507	0.7860 X	0.2292	0.0514
Plantek	0.2279	0.5820 X	0.1616	0.3607
Bakthik	-0.0918	0.2038	0.0724	0.6116 X
Ingo	0.4379	0.2900	-0.4125	0.2867
Nathalie	-0.0229	-0.0244	0.7472 X	0.0311
Alexandra1	0.2415	-0.1407	0.3482	0.3949
Manuel	0.5413 X	0.3638	-0.0237	0.3119
Alexandra2	-0.0055	0.7124 X	0.2733	0.2054
% expl.var.	15	14	13	11

In the result of the automatic marking of the 23 Q-sortings by the programme PQMethod, this explains a total of 53% of the variance of the variables. Although the loss of information is remarkably high at 47%, a total of 20 of the 23 participants can be assigned to one of the four factors. Three of them (13, 19, 21) cannot be assigned to any of the four factors. As a result, the marking yielded the following distribution: six Q-sortings loaded on the first factor, three of them with a factor loading >0.6 , five on the second factor, four with factor loadings >0.6 , four on the third factor, all of them with factor loadings >0.6 , and five on the fourth factor, three of them with factor loadings above >0.6 . Three Q-sortings did not load on any of the factors. According to

Bortz (2016) for a generalising interpretation of a factor structure, the condition must be fulfilled that at least four variables (in the case of the Q technique, persons) have factor loadings >0.6 . Against this background, the factors determined here can be regarded as a meaningful dimensional reduction.

Table 3 contains the four factors and indicates the agreement or disagreement of each perspective with each statement. The factor scores presented in Table 3 indicate the strength of agreement and show the ranking of each item within each factor illustrating the Q-sort ranking. The interpretive task of the Q-Method involves producing a collected of summary plots, each of which reflects the viewpoint expressed by a particular factor. These representations are structure by careful reference to position and factor arrangements. For example, Statement 10 differs strongly on Factor 4. It tends to represent a negative opinion (score -3), while Factor 3 tends to represent the opposite opinion (score 1) and Factor 1 and Factor 2 represent a similar opinion (score 2). As a result, some statements have a concurring opinion on all four factors. All four factors agree that more is bought than is needed and that it would be sustainable if only products that are really needed were bought. They also agree that the purchasing behaviour of consumers has a decisive influence on environmental and climate protection and that they would also pay more for a product if it met certain sustainability criteria, had little packaging and was seasonally sourced from the region. Furthermore, all factors agree that it is important that the manufacturer produces in an environmentally friendly way. In addition, there is agreement that the more a company contributes to sustainability, the more it can retain its customers and that cooperation offers advantages for companies that are increasingly under pressure to integrate into the global value chain. As a result, for all four factors, sustainability already begins with one's own consumption and the awareness that this already begins

with the selection of the product. These Consensus Statements are contrasted with so-called Distinguishing Statements. These are marked with an asterisk (*) in Table 3. Through these statements, the factors differ significantly from each other. For example, Statement No. 4 is only rejected by Factor 1 with -3. For the other two factors, this statement is weakly true with +2.

Table 3: Q- Sort values for each statement

Faktor Q- Sort values for each statement				
Statement	Factor 1	Factor 2	Factor 3	Factor 4
1. Co-operation reduces competition, reduces efficiency and therefore has a negative impact on sustainability	-2	1	-4	-4
2. Competition encourages innovation, while cooperation tends to slow down innovation	-2	3	-3	-3
3. Cooperation between competitors is only feasible in the short term. In the long run, all market players tend to be free-riding.	0	2	-2	-4
4. Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	-3*	2	0	1
5. Consumers have little impact on the sustainability performance of businesses.	-3	4	-3	1
6. People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.	4	3	4	2
7. Companies ensure transparency of their activities along the entire supply chain	0	3	-1	-2
8. The UN 2030 Sustainable Development Goals encourage cooperation between competitors.	1	1	-1	-1
9. Retailers and consumer goods companies work closely together to jointly implement sustainability strategies.	2	2	1	-3*
10. The prices of products produced by enterprises that take sustainability requirements into account should be cheaper than those produced in the conventional way.	-4*	2	3	1
11. The regulator should oblige companies to enforce their social and environmental standards through written contracts along the entire supply chain.	-1*	4	4	2
12. When competitors merge, they do so mainly to save costs.	-1	1	-1	3
13. Increasing competition and a complex and uncertain business environment make cooperation with competitors an essential strategic tool.	3	0	2	-1*
14. Companies will be forced to work closely with competitors to meet their sustainability commitments by 2030.	2	1	0	-2*

15. Coopetition is primarily about creating new markets and expanding existing ones; improving environmental performance is secondary.	-1	2	-1	3
16. Businesses are important economic actors, but their role in achieving global environmental sustainability is not important.	-4	4	-4	-3
17. The increasing demand for sustainable production and the valuable use of resources in a largely globalised economy strengthens the desire for joint entrepreneurial cooperation.	0	0	2	-1
18. Collaboration offers advantages for companies as they face increasing pressure to integrate the global value chain	3	2	1	0
19. Consumer purchasing behaviour has a decisive impact on environmental and climate protection	4	4	0	2
20. Consumers tend to see the responsibility for sustainable consumption more as their own and are not aware of the role of business in promoting sustainable consumption.	-1	0	-2	1
21. Any dimension of sustainability can only be achieved along the entire supply chain of a product.	-2*	3	1	2
22. Consumers are not interested in the sustainability features of products, but in their availability at the right quality and price	0	3	-2	3
23. I would pay more for a product if it met certain sustainability criteria	2	1	3	2
24. For international car manufacturers, profit is more important than the environmental impact of their business.	0	1	1	4
25. When buying a product, it is important to me that it has little packaging and is seasonal and from the region.	2	1	1	0
26. The more a company contributes to sustainability, the more it can retain its customers.	1	0	0	-1
27. In the future, cars will no longer be status symbols. Young people will see their vehicle as a mobility tool that should not overburden the environment.	-2	2	-2	4
28. The sustainability reputation of a car brand is a decisive factor when buying a car.	0	2	-1	-2
29. Brand loyalty plays a bigger role when buying a product than actual performance	3	3	0	1
30. When buying a product, environmental performance is important to me.	1	1	1	-2
31. Everyone should be able to afford to buy only environmentally friendly products.	-1	0	3	0
32. It is important to me that my manufacturers, from whom I like to buy products, produce in an environmentally friendly way	1	1	2	0
33. The goal of companies is to know and understand the customer so well that the product or service fits them and sells itself.	2	1	0	0

34. A company should certify to the consumer that its products have been produced sustainably.	1	1	2	-1
35. There should be subsidies from the state for the production of sustainable goods.	0	0	2	-2*
36. A company that develops a new technology innovation that contributes to environmental awareness should share the innovation with other companies	-3	2	0	-1
37. Start-up companies strive unsuccessfully to innovate because market success fails to materialise	-2	1	-1	0
38. People trust local products because of their good value for money	1	2	-2*	0
39. The issue of organic food is overrated because most of the food we eat contains chemicals anyway	-1	0	-3	1

PQMethod2.35

In addition, the results are supplemented by characteristics about the participants that load on the factors, including information on age, gender, education, professional status and own experience in relation to cooperation with competitors and sustainability (Table 4).

Table 4: Participant group

Factor	Employment in the company			Sustainability awareness	Experience with Cooperation	Age			Gender		University	Education Higher education entrance qualification	Vocational training
	Owner	Manager	Employee			under 30	30 - 50	over 50	male	female			
1	17%	67%	33%	100%	100%	33%	33%	33%	67%	33%	83%	17%	0%
2	0%	40%	60%	80%	20%	40%	40%	20%	40%	60%	20%	60%	20%
3	25%	50%	25%	50%	50%	25%	25%	50%	25%	75%	75%	25%	0%
4	20%	40%	40%	80%	80%	20%	60%	20%	80%	40%	20%	60%	0%

In the next step, the four views are interpreted using the Z-scores. Z-values multiplied by the standard deviation indicate how far a statement is from the centre of the distribution (Webler et. al., 2009). The highest and lowest Z-values are used for the interpretation. These indicate which statements are ranked at the highest or lowest columns in the ideal Q-sort of the respective

factor. In the second column of the respective factor are the numbers of the statements to which the interpretation refers and whose ranking in the ideal Q-sort is indicated (Table 5).

Table 5: Factor matrix with defining Sorting

Factor Matrix with an X Indicating a Defining Sort				
QSORT	Factor 1	Factor 2	Factor 3	Factor 4
Gayane	0.5617 X	-0.2672	0.4076	0.2006
Jürgen	0.4506 X	0.1996	0.0355	0.2080
Valeria	0.6427 X	0.1771	0.3298	0.0884
Dennis	0.7054 X	0.2048	0.1649	0.0806
Ton	0.7206 X	-0.2869	0.1698	0.0530
Manuel	0.5413 X	0.3638	-0.0237	0.3119
Rene	0.1118	0.6380 X	-0.0483	0.1063
Ruth	-0.1506	0.6513 X	-0.0221	0.0963
Tai	0.1507	0.7860 X	0.2292	0.0514
Plantek	0.2279	0.5820 X	0.1616	0.3607
Alexandra2	-0.0055	0.7124 X	0.2733	0.2054
Dirk	0.2154	0.3072	0.7710 X	0.2563
Judith	0.0845	0.1563	0.7689 X	0.0375
Phyllis	0.3591	0.3030	0.7056 X	0.0023
Natalie	-0.0229	-0.0244	0.7472 X	0.0311
Uwe	-0.0247	0.1686	-0.1120	0.4570 X
Florian	0.4716	-0.0253	-0.0137	0.4835 X
Götz	-0.3759	-0.0979	0.0014	0.7149 X
Kirina	0.1565	0.4703	0.1429	0.6292 X
Bakthik	-0.0918	0.2038	0.0724	0.6116 X
% expl.var.	15	14	13	11

4.8. Interpretation

The next step is to analyse and evaluate the common themes and viewpoints within the four factors following Stephenson's (1935, 1953) holistic approach. Whereby I assumed that each type is related to the person's qualification or

profession. During the research, it could already be seen that there were already different opinions on sustainability and cooperation with competitors. At least four type variants are expected with the referral of the opinion patterns. At the end of the analysis, the following four types with corresponding opinion patterns were identified based on the Q-method:

1.Type: Conscious leaders and committed managers

Characteristics: Influential position, sustainability-oriented with experience in cooperation with competitors. The opinion of Type 1 can be described as economically liberal, as cooperation with competitors is viewed positively from a sustainability point of view and sustainable products should have a corresponding price. This characteristic has already gained experience in dealing with competitors in the past and sees sustainability as a corresponding cost factor.

2.Type: Emotionally engaged, but not strategists

Characteristics: No influential position, sustainability-oriented. The opinion of Type 2 could be described as pragmatic. The basic attitude of this type is that economic, social or ecological problems should be remedied by government action in the guidelines and regulations are prescribed. This can be, for example, regulations for the keeping of animals in stables or the renovation of buildings. In this way, sustainability is enforced by legal requirements.

3.Type: Modern leaders, business and sustainability are not contradictory

Characteristics: Influential position, sustainability-oriented with partial experience in working with competitors. The opinion picture of Type 3 can be described as optimistically responsible. A core statement is that consumers and companies have a mutual responsibility for sustainability.

4.Type: Mainly practitioner-trained professionals

Characteristics: With predominantly influential position, sustainability-oriented with predominant experience in cooperation with competitors. The opinion profile of Type 4 can be described as conservative, economically liberal, reasonable but also critical. Consumers and companies are seen as having a mutual responsibility for sustainability, but here the economic view is in the foreground. Thus, entrepreneurship and economic aspects are clearly in the foreground. Especially in the case of innovations and scarcity of resources, this attitude can be advantageous.

Due to the complexity of the modes of action and the consideration of the perspectives of managers and companies as well as consumers, the four types reflect a comprehensive picture. In particular, types three and four link sustainability as a shared responsibility as entrepreneurs and the consumers. Thus, 50% of the identified groups link customer loyalty with consumers. Sustainability is associated with a customer loyalty motivation. Group one sees it differently. It is true that there is also a motivation for sustainability here. However, the consumer is not in the foreground here, but rather that one must implement sustainability oneself, which must, however, have a certain price. Type two, which sees sustainability with state intervention, is conspicuous. This means that sustainability is not seen on a voluntary basis, but would rather be implemented on the basis of state regulations.

After the corresponding allocation of the individual opinion types, the statements are then evaluated according to the opinions of the four types. The total overview of the factor scores is shown in Table 4.

Table 6: Factor values with corresponding ranks

No.	Statement	No.	1		2		3		4	
1.	Co-operation reduces competition, reduces efficiency and therefore has a negative impact on sustainability	1.	-1.02	33	-0.47	27	-1.62	38	1.58	41
2.	Competition encourages innovation, while cooperation tends to slow down innovation.	2.	-1.02	34	1.26	4	-1.45	36	1.37	38
3.	Cooperation between competitors is only feasible in the short term. In the long run, all market players tend to be free-riding.	3.	-0.21	23	0.70	9	-0.72	30	1.61	42
4.	Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	4.	-1.17	35	1.11	6	-0.24	21	0.66	15
5.	Consumers have little impact on the sustainability performance of businesses...	5.	-1.34	37	-2.03	38	-1.16	35	0.54	17
6.	People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.	6.	2.61	1	1.19	5	1.68	2	1.07	11
7.	Companies ensure transparency of their activities along the entire supply chain	7.	0.07	19	-1.87	37	-0.32	24	0.68	33
8.	The UN 2030 Sustainable Development Goals encourage cooperation between competitors.	8.	0.35	15	-0.11	24	-0.47	27	0.47	30
9.	Retailers and consumer goods companies work closely together to jointly implement sustainability strategies.	9.	0.65	9	-0.84	32	0.77	11	1.39	39
10.	The prices of products produced by enterprises that take sustainability requirements into account should be cheaper than those produced in the conventional way.	10.	-1.69	38	1.02	7	1.52	3	0.61	16
11.	The regulator should oblige companies to enforce their social and environmental standards through written contracts along the entire supply chain.	11.	-0.41	27	1.81	2	2.08	1	1.03	12
12.	When competitors merge, they do so mainly to save costs.	12.	-0.37	26	0.27	14	-0.53	28	1.65	6
13.	Increasing competition and a complex and uncertain business environment make cooperation	13.	1.21	3	0.15	17	0.85	9	0.39	27

	with competitors an essential strategic tool.									
14.	Companies will be forced to work closely with competitors to meet their sustainability commitments by 2030.	14.	0.56	10	0.63	11	-0.29	23	-	36
15.	Coopetition is primarily about creating new markets and expanding existing ones; improving environmental performance is secondary.	15.	-0.24	25	-0.74	31	-0.41	25	1.17	8
16.	Businesses are important economic actors, but their role in achieving global environmental sustainability is not important.	16.	-2.17	39	-2.13	39	-2.02	39	-	40
17.	The increasing demand for sustainable production and the valuable use of resources in a largely globalised economy strengthens the desire for joint entrepreneurial cooperation.	17.	0.19	18	-0.08	23	0.78	10	0.58	32
18.	Collaboration offers advantages for companies as they face increasing pressure to integrate the global value chain	18.	0.97	5	0.65	10	0.73	12	-	25
19.	Consumer purchasing behaviour has a decisive impact on environmental and climate protection	19.	2.42	2	2.02	1	0.07	19	0.89	13
20.	Consumers tend to see the responsibility for sustainable consumption more as their own and are not aware of the role of business in promoting sustainable consumption.	20.	-0.56	29	0.06	19	-1.15	34	0.71	14
21.	Any dimension of sustainability can only be achieved along the entire supply chain of a product....	21.	-0.98	32	1.68	3	0.36	16	1.12	10
22.	Consumers are not interested in the sustainability features of products, but in their availability at the right quality and price	22.	0.01	20	-1.25	35	-1.11	33	1.48	7
23.	I would pay more for a product if it met certain sustainability criteria	23.	0.92	6	-0.64	29	1.14	5	1.16	9
24.	For international car manufacturers, profit is more important than the environmental impact of their business.	24.	-0.20	22	0.45	12	0.52	14	1.67	5

25.	When buying a product, it is important to me that it has little packaging and is seasonal and from the region.	25.	0.80	8	0.16	16	0.42	15	0.16	20
26.	The more a company contributes to sustainability, the more it can retain its customers...	26.	0.46	13	0.02	20	0.29	17	0.39	28
27.	In the future, cars will no longer be status symbols. Young people will see their vehicle as a mobility tool that should not overburden the environment.	27.	-0.89	31	1.00	8	-1.07	32	1.75	4
28.	The sustainability reputation of a car brand is a decisive factor when buying a car.	28.	0.19	21	-0.99	34	-0.43	26	1.13	35
29.	Brand loyalty plays a bigger role when buying a product than actual performance	29.	1.06	4	-1.30	36	0.02	20	0.21	18
30.	When buying a product, environmental performance is important to me.	30.	0.30	16	-0.13	25	0.59	13	0.93	34
31.	Everyone should be able to afford to buy only environmentally friendly products.	31.	-0.52	28	0.11	18	1.26	4	0.15	24
32.	It is important to me that my manufacturers, from whom I like to buy products, produce in an environmentally friendly way	32.	0.53	11	-0.14	26	1.03	7	0.05	22
33.	The goal of companies is to know and understand the customer so well that the product or service fits them and sells itself.	33.	0.81	7	0.24	15	0.26	18	0.31	26
34.	A company should certify to the consumer that its products have been produced sustainably.	34.	0.42	14	0.32	13	1.11	6	0.57	31
35.	There should be subsidies from the state for the production of sustainable goods.	35.	0.23	17	-0.06	22	0.86	8	1.25	37
36.	A company that develops a new technology innovation that contributes to environmental awareness should share the innovation with other companies	36.	-1.28	36	-0.70	30	-0.28	22	0.46	29
37.	Start-up companies strive unsuccessfully to innovate because market success fails to materialise	37.	-0.58	30	-0.49	28	-0.65	29	0.02	23
38.	People trust local products because of their good value for money	38.	0.50	12	-0.85	33	-0.95	31	0.15	21
39.	The issue of organic food is overrated because most of the food we eat contains chemicals anyway	39.	-0.23	24	0.00	21	-1.48	37	0.19	19

4.9. Evaluation of the results

1.Type: Conscious leaders and committed managers

Type 1 corresponds to the calculated factor 1. This is the factor with the most significant factor scores, namely six. Of the six Q-sorts that show a significant correlation with this factor, managers or company owners who are sustainability-conscious and already have experience with co-opetition are significantly represented.

All of the statements ranked highest by Z-scores in factor 1 are about cooperation and sustainable consumption. Participants who load on this factor are economically oriented and agree that increasing competition can make cooperation with competitors an important strategic tool (13:3). Furthermore, brand loyalty to a product plays a greater role for them than the service provided (29:4). Furthermore, the group is aware that consumer buying behaviour has a decisive influence on environmental and climate protection (19:2) and that consumers should buy more sustainably by only buying things they actually need (6:1).

Table 7: Statements with Agreement for factor 1

	Statements	Ranking	
6.	People buy a lot of things they don't need. It would be sustainable if we only bought products that we really need.	2.61	1
19.	Consumers' purchasing behaviour has a decisive influence on environmental and climate protection.	2.42	2
13.	Increasing competition and a complex and uncertain business environment make cooperation with competitors an important strategic tool.	1.21	3
29.	Brand loyalty plays a bigger role than actual performance when buying a product.	1.06	4

The statements with the lowest Z-scores of factor 1 remain consistent in terms of content; corporate cooperation remains the central theme. Especially significant is the opinion that companies have a crucial role in achieving global environmental sustainability (16:39) and that consumers also have an influence on their sustainability performance (5:37). In relation to the issue of sustainability, the prevailing opinion is that collaboration is efficient and equally promotes innovation (1:33; 2:34, 4:35). In contrast, a company that develops a new technological innovation that contributes to environmental awareness should not share it with other companies (36:36). Furthermore, the low Z-scores suggest that prices for sustainable products are reasonable (10:38), therefore sustainable products would still be bought even if they are above the usual prices.

Table 8: Statements with disagreement for factor 1

Statements	Ranking	
6. People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.	2.61	1
19. Consumer purchasing behaviour has a decisive impact on environmental and climate protection	2.42	2
13. Increasing competition and a complex and uncertain business environment make cooperation with competitors an essential strategic tool.	1.21	3
29. Consumer purchasing behaviour has a decisive impact on environmental and climate protection.	1.06	4
16. Businesses are important economic actors, but their role in achieving global environmental sustainability is not important.	- 2.17	- 39
10. The prices of products produced by enterprises that take sustainability requirements into account should be cheaper than those produced in the conventional way.	- 1.69	- 38
5. Consumers have little impact on the sustainability performance of businesses.	-1.34	37
36. A company that develops a new technology innovation that contributes to environmental awareness should share the innovation with other companies	- 1.28	- 36
4. Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	- 1.17	- 35
1. Co-operation reduces competition, reduces efficiency and therefore has a negative impact on sustainability	-1.02	33

2. Competition encourages innovation, while cooperation tends to slow down innovation. -1.02 34

In summary, the opinion of the participants in factor group 1 gives a positive economic-liberal picture. It carries the view that cooperation with competitors can be positively evaluated from a sustainability point of view and that sustainable products should have a corresponding price. Another core statement is that companies have an essential role in implementing sustainability and should advance this through cooperation with competitors. The basic attitude and behaviour of factor group 1 also reflects the characteristics of the participants, which are listed in Table 8.

2.Type: Emotionally engaged, but not strategists

Type 2 corresponds to factor 2, i.e. all participants whose Q-Sorts have positive significant similarities with factor 2 are attributed this view. This group of participants consists predominantly of employees who have only limited experience in cooperating with competitors, but who nevertheless act in a sustainability-oriented manner. The Z-values show statements that represent the opinion that co-opetition does not bring any advantages in practice and that cooperation with competitors slows down innovations (4:6; 2:4). In Factor 2, the regulatory authority is increasingly seen as having a duty to contractually implement social and environmental standards at companies, as they also believe that every dimension of sustainability can only be achieved along the entire supply chain of a product (11:2; 21:3). Furthermore, mobility should no longer place an excessive burden on the environment in the future and cars should no longer be a status symbol (27:8). Sustainable products should also be cheaper than normal products (10:7).

Table 9: Statements with Agreement at factor 2

	Statements	Ranking	
19.	Consumers' purchasing behaviour has a decisive influence on environmental and climate protection.	2.02	1
11.	The regulator should require companies to enforce their social and environmental standards through written contracts along the entire supply chain.	1.81	2
21.	Each dimension of sustainability can only be achieved along the entire supply chain of a product.	1.68	3
2.	Competition promotes innovation, while cooperation tends to slow it down.	1.26	4
6.	People buy a lot of things they don't need. It would be sustainable if we only bought products that we really need.	1.19	5
4.	Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	1.11	6
10.	The prices of products produced by companies that take into account the requirements of sustainability should be cheaper than the prices of products produced in the conventional way.	1.02	7
27.	In the future, the car will no longer be a status symbol. Young people will see their vehicle as a means of mobility that should not overly burden the environment.	1.00	8

The lowest Z-scores for factor 2 are found in the statements (5:38; 7:37, 22:35; 29:36; 16:39) that considers the influence of consumers on the sustainability performance of companies to be significant and also that consumers are interested in the sustainability features of products and that brand loyalty does not play a significant role in their decision. The group also argues that companies have an influence on environmental sustainability.

Table 10: Statements with disagreement at factor 2

Statements	Ranking	
11. The regulator should oblige companies to enforce their social and environmental standards through written contracts along the entire supply chain.	1.81	2
21. Any dimension of sustainability can only be achieved along the entire supply chain of a product...	1.68	3
2. Competition encourages innovation, while cooperation tends to slow down innovation.	1.26	4
6. People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.	1.19	5
4. Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	1.11	6

10. The prices of products produced by enterprises that take sustainability requirements into account should be cheaper than those produced in the conventional way.	<i>1.02</i>	7
27. I In the future, cars will no longer be status symbols. Young people will see their vehicle as a mobility tool that should not overburden the environment.	<i>1.00</i>	8
16. Businesses are important economic actors, but their role in achieving global environmental sustainability is not important..	<i>-2.13</i>	39
5. Consumers have little impact on the sustainability performance of businesses.	<i>-2.03</i>	38
7. Companies ensure transparency of their activities along the entire supply chain	<i>-1.87</i>	37
29. Brand loyalty plays a bigger role when buying a product than actual performance	<i>-1.30</i>	36
22. Consumers are not interested in the sustainability features of products, but in their availability at the right quality and price	<i>-1.25</i>	35

In summary, Type 2 can be described as pragmatic, although they have a positive basic attitude towards sustainability. Economic, social or environmental problems should be addressed by government action . The main message is that legal frameworks encourage companies to push sustainability goals. Other aspects such as competition and cooperation tend to be secondary for the participants and they view them rather sceptically. This attitude also reflects the experience of cooperation with competitors. For Type 2, this is largely non-existent. The characteristics are summarised in Table 10.

3.Type: Modern leaders, business and sustainability are not contradictory

Type 3 corresponds to the calculated factor 3. Overall, these are participants, 75% of whom are predominantly managers, as well as company owners. The remainder is assigned to the proportion of employees. The rather moderate attitude towards sustainability issues is significant. Furthermore, half of the participants had experience in working with competitors.

The Z-values of the statements (23:5; 34: 6,) show that it is important to the participants that companies produce their products in an environmentally

friendly way and also certify this to consumers. Interestingly, like the participants in factor group 2, they also see the regulatory authority as responsible for the implementation of social and environmental standards (11:1). Furthermore, this group of participants would also pay more for sustainable products (23:5), but they are of the opinion that everyone should be able to afford sustainable products, and companies that sell sustainable products should also offer them at a lower price (10:3; 31:4).

Table 11: Statements with Agreement at factor 3

	Statements	Ranking	
11.	The regulator should require companies to enforce their social and environmental standards through written contracts along the entire supply chain .	2.08	1
6.	People buy a lot of things they don't need. It would be sustainable if we only bought products that we really need.	1.68	2
10.	The prices of products produced by companies that take into account the requirements of sustainability should be cheaper than the prices of products produced in the conventional way.	1.52	3
31.	Everyone should be able to afford to buy only environmentally friendly products.	1.26	4
23.	I would pay more for a product if it met certain sustainability criteria.	1.14	5
34.	A company should certify to the consumer that its products have been produced sustainably.	1.11	6
32.	It is important to me that my manufacturers, from whom I like to buy products, produce in an environmentally friendly way.	1.03	7

The lowest Z-scores are found in statements that see the need for cooperation between competitors in connection with innovation and sustainability (1:38; 2:36; 16:39; 20:34)). In their view, cooperation strengthens efficiency and promotes sustainability. At the same time, they see companies as essential actors in relation to sustainability issues. They agree that it is not only consumption that contributes to and influences sustainability (5:35).

Low Z-scores of the factor group also show statements that concern consumers. They agree that consumers are very much interested in

sustainability features in products and that in the future certain status symbols, such as cars, will no longer play a role (22:33; 27:32).

Table 12: Statements with no Agreement for factor 3

	Statements	Ranking	
16.	Companies are important economic actors, but their role in achieving global environmental sustainability is not important.	-2.02	39
1.	Cooperation reduces competition, reduces efficiency and therefore has a negative impact on sustainability.	-1.62	38
2.	Competition promotes innovation, while cooperation tends to slow it down.	-1.45	36
5.	Consumers have little influence on the sustainability performance of companies.	-1.16	35
20.	Consumers tend to see the responsibility for sustainable consumption more in themselves and are not aware of the role of companies in promoting sustainable consumption.	-1.15	34
22.	Consumers are not interested in the sustainability features of products, but in their availability in the right quality and at the right price	-1.11	33
27.	In the future, the car will no longer be a status symbol. Young people will see their vehicle as a means of mobility that should not overly burden the environment.	-1.07	32

In summary, type 3 can be described as optimistic responsible . Although the basic attitude towards sustainability awareness, according to Table 6, is rather lower than the other factor groups, they do not see any contradiction in leadership and sustainability. An essential core statement is that consumers and companies bear mutual responsibility for sustainability. Be it that consumers influence companies or companies cooperate with other competitors to contribute in the form of innovation and sustainability. The factor scores for Factor 3 are shown in Table 12.

4.Type: Mainly practitioner-trained professionals

Type 4 corresponds to the calculated factor 4. Overall, the participants are mainly managers and employees who gave their assessment or statements. However, the majority already has experience in working with competitors, which is different from factor values 2 and 3.

Based on the Z-scores of the statements (12:6; 15:8, 24:5), it is assumed here that competitors merge mainly to save costs and that cooperation is primarily about creating new markets and expanding existing ones. Improving environmental performance is also seen as secondary. Interestingly, Type 4 carries the view that consumers are not interested in the sustainability features of products, but in their availability at the right quality and price (22:7). Nevertheless, these also note that people buy a lot of things they do not need. From their point of view, it would be sustainable if only products that are really needed were bought (6:11). This also suggests why they believe that regulators should intervene to enforce certain standards (11:12). They also believe that in the future the car will no longer be a status symbol and that young people will see their car as a means of mobility that does not overly burden the environment (27:4).

Table 13: Statements with Agreement at factor 4

	Statements	Ranking	
27.	In the future, the car will no longer be a status symbol. Young people will see their vehicle as a means of mobility that should not overly burden the environment.	1.75	4
24.	For international car manufacturers, profit is more important than the environmental impact of their operations.	1.67	5
12.	When competitors merge, they do so mainly to save costs.	1.65	6
22.	Consumers are not interested in the sustainability features of products, but in their availability in the right quality and at the right price	1.48	7
15.	Cooperation is primarily about creating new markets and expanding existing ones; improving environmental performance is secondary.	1.17	8
23.	I would pay more for a product if it met certain sustainability criteria.	1.16	9
21.	Each dimension of sustainability can only be achieved along the entire supply chain of a product.	1.12	10
6.	The people buy a lot of things they don't need. It would be sustainable if we only bought products that we really need.	1.07	11
11.	The regulator should require companies to enforce their social and environmental standards through written contracts along the entire supply chain.	1.03	12

The lowest Z-scores are found in statements that also see the need for cooperation between competitors in connection with innovation and sustainability (1:41; 2:38). Furthermore, cooperation can also be based on a longer and voluntary basis (3:42). Low Z-scores also show statements that companies are also important actors and that they contribute to environmental sustainability (16:40; 9:39; 14:36), although implementing joint sustainability strategies between retailers and consumer goods companies is not seen as realistic.

Table 14: Statements with no Agreement for factor 4

	Statements	Ranking	
3.	Cooperation between competitors is only possible in the short term. In the long term, market participants tend to be free riders	-1.61	42
1.	Cooperation reduces competition, reduces efficiency and therefore has a negative impact on sustainability.	-1.58	41
16.	Companies are important economic actors, but their role in achieving global environmental sustainability is not important.	-1.55	40
9.	Retailers and consumer goods companies work closely together to implement sustainability strategies.	-1.39	39
2.	Competition promotes innovation, while cooperation tends to slow it down.	-1.37	38
14.	Companies will be forced to work closely with their competitors to meet their sustainability commitments by 2030.	-1.22	36

In summary, type 4 can be described as conservative, economically liberal, reasonable but also critical. A core statement is that consumers and companies have a mutual responsibility for sustainability, but that the economic view is more in the foreground based on the factor values.

Distinguishing features between the identified views

Looking at the opinion patterns of the different types, the "conscious leaders and committed managers" of type 1 show significant differences in various statements. Significant is the attitude that people buy too much of things they do not need. Nevertheless, it can be seen that factors 2 to 4 also show this

statement in different degrees. This also leads to the fact that type 1 also holds the opinion that brand status has a significant influence and that actual performance is of secondary importance. This then also leads to Type 1's logical conclusion that prices of products manufactured by companies that take the requirements of sustainability into account should be more favourable than the prices of products manufactured in the conventional way. It is also felt that it is not the regulators who should be concerned about sustainability. It is also important to Type 1 that sustainability cannot already make a contribution along the supply chains. Also significant is the opinion that co-competition is successful in practice. This is again justifiable, as the people of Type 1 already have experience in the field.

Table 15: Distinguishing Statements for Factor 1

($P < .05$; Asterisk (*) Indicates Significance at $P < .01$)

		Factors							
		Type 1		Type 2		Type 3		Type 4	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
6	People buy a lot of things they don't need. It would be sustainable if we only bought products that we really need.	4	2.61*	3	1.19	4	1.68	2	1.07
29	Brand loyalty plays a bigger role than actual performance when buying a product.	3	1.06*	-3	-1.30	0	0.02	1	0.21
22	Consumers are not interested in the sustainability features of products, but in their availability in the right quality and at the right price	0	0.01*	-3	-1.25	-2	-1.11	3	1.48
24	For international car manufacturers, profit is more important than the environmental impact of their operations.	0	-0.20	1	0.45	1	0.52	4	1.67
11	The regulator should require companies to enforce their social and environmental standards through written contracts along the entire supply chain.	-1	-0.41*	4	1.81	4	2.08	2	1.03
21	Each dimension of sustainability can only be achieved along the entire supply chain of a product.	-2	-0.98*	3	1.68	1	0.36	2	1.12

4	The co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful .	-3	-1.17*	2	1.11	0	-0.24	1	0.66
36	A company that develops a new technological innovation that contributes to environmental awareness should share this innovation with other companies.	-3	-1.28	-2	0.70	0	-0.28	-1	-0.46
10	The prices of products produced by companies that take into account the requirements of sustainability should be cheaper than the prices of products produced in the conventional way.	-4	-1.69*	2	1.02	3	1.52	1	0.61

Looking at the opinion pictures of type 2, it is very noticeable that this picture rather reflects consumer behaviour. In particular, the attitude that people would pay more for a product if it met certain sustainability criteria and that Consumers have little influence on the sustainability performance of companies. Type 2 is also aware that companies do not ensure transparency of their activities along the entire supply chain. In line with these significant statements, this also reflects the characteristics of type two, namely Emotionally Engaged but not Strategists. Which is again evident from the composition of the group. Because this mainly consists of employees who have a strong awareness of sustainability.

Table 16: Distinguishing Statements for Factor 2

($P < .05$; Asterisk (*) Indicates Significance at $P < .01$)

		Factors							
		Type 1		Type 2		Type 3		Type 4	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
2	Competition promotes innovation, while cooperation tends to slow it down.	-2	-1.02	3	1.26*	-3	-1.45	-3	-1.37
27	In the future, the car will no longer be a status symbol. Young people will see their vehicle as a means of mobility that should not overly burden the environment.	-2	-0.89	2	1.00	-2	-1.07	4	1.75

3	Cooperation between competitors is only possible in the short term. In the long term, all market participants tend to be free riders	0	-0.21	2	0.70*	-2	-0.72	-4	-1.61
12	When competitors merge, they do so mainly to save costs.	-1	-0.37	1	0.27	-1	-0.53	3	1.65
20	Consumers tend to see the responsibility for sustainable consumption more in themselves and are not aware of the role of companies in promoting sustainable consumption.	-1	-0.56	0	0.06	-2	-1.15	1	0.71
23	I would pay more for a product if it met certain sustainability criteria.	2	0.92	-1	-0.64*	3	-1.14	2	1.16
29	Brand loyalty plays a bigger role than actual performance when buying a product.	3	1.06	-3	-1.30*	0	-0.02	1	0.21
7	The companies ensure transparency of their activities along the entire supply chain.	0	0.07	-3	-1.87*	-1	-0.32	-2	-0.68
5	Consumers have little influence on the sustainability performance of companies .	-3	-1.34	-4	-2.03	-3	-1.16	1	0.54

Type 3 characteristics do have a positive attitude towards sustainability. However, they are critical of organic food because they think it is overrated because most food contains chemicals anyway. Although they believe that everyone should be able to afford environmentally friendly products and that in order to achieve this, it takes considerable subsidies to produce these goods. Significantly, the basic attitude tends to be that companies should certify sustainable production to the consumer.

Table 17: Distinguishing Statements for Factor 3

(P < .05 ; Asterisk (*) Indicates Significance at P < .01

		Factors							
		Type 1		Type 2		Type 3		Type 4	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
31	Everyone should be able to afford to buy only environmentally friendly products.	-1	-0.52	0	0.11	3	1.26*	0	-0.15
34	A company should certify to the consumer that its products have been produced sustainably.	1	0.42	1	0.32	2	1.11	-1	-0.57
35	There should be government subsidies for the production of sustainable goods.	0	0.23	0	0.06	2	0.86	-2	1.25
21	Each dimension of sustainability can only be achieved along the entire supply chain of a product.	-2	-0.98	3	1.68	1	0.36	2	1.12
19	Consumers' purchasing behaviour has a decisive influence on environmental and climate protection.	4	2.42	4	2.02	0	0.07	2	0.89
4	Co-opetition is theoretically beneficial for all parties, but in practice it is rarely successful.	-3	-1.17	2	1.11	0	-0.24*	1	0.66
14	Companies will be forced to work closely with their competitors to meet their sustainability commitments by 2030.	2	0.56	1	0.63	0	-0.29*	-2	-1.22
39	The issue of organic food is overrated because most of the food we eat contains chemicals anyway.	-1	0.23	0	0.00	-3	-1.48*	1	0.19

If we look at type 4 in comparison to the other types, it is obvious that they play a significant role in most statements and thus clearly deviate from the other opinions of types 1 to 3. In particular, they attach a lot of importance to the economic area and hardly address the consumer side. The economic aspects are important for this type, in that they are of the opinion that profit is more important to international car manufacturers than the environmental impact of their activities and competitors merge, they do this mainly to save costs. They also reject government influence, in that subsidies are not given for the production of sustainable goods. Nor do they see any significant importance in companies certifying to consumers that their products have been produced

sustainably and this also reflects the view that a product is environmentally sound.

Type four, in particular, differs significantly from the other types 1 to 3 in its opinion.

Table 18: Distinguishing Statements for Factor 3

($P < .05$; Asterisk (*) Indicates Significance at $P < .01$)

		Factors							
		Type 1		Type 2		Type 3		Type 4	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
27	In the future, the car will no longer be a status symbol. Young people will see their vehicle as a means of mobility that should not overly burden the environment.	-2	-0.89	2	1.00	-2	-1.07	4	1.75
24	For international car manufacturers, profit is more important than the environmental impact of their operations.	0	0.20	1	0.45	1	0.52	4	1.67*
12	When competitors merge, they do so mainly to save costs.	-1	-0.37	1	0.27	-1	-0.53	3	1.65*
22	Consumers are not interested in the sustainability features of products, but in their availability in the right quality and at the right price	0	0.01	-3	-1.25	-2	-1.11	3	1.48*
15	Cooperation is primarily about creating new markets and expanding existing ones; improving environmental performance is secondary.	-1	-0.24	-2	-0.74	-1	-0.41	3	1.17*
11	The regulator should require companies to enforce their social and environmental standards through written contracts along the entire supply chain.	-1	-0.41	4	1.81	4	2.08	2	1.03
19	Consumers' purchasing behaviour has a decisive influence on environmental and climate protection.	4	2.42	4	2.02	0	0.07	2	0.89
20	Consumers tend to see the responsibility for sustainable consumption more in themselves and are not aware of the role of	-1	-0.56	0	0.06	-2	-1.15	1	0.71

	companies in promoting sustainable consumption.								
5	Consumers have little influence on the sustainability performance of companies.	-3	-1.34	-4	-2.03	-3	-1.16	1	0.54*
18	Collaboration offers advantages for companies that are increasingly under pressure to integrate the global value chain.	3	0.97	2	0.65	1	0.73	0	0.24*
34	A company should certify to the consumer that its products have been produced sustainably.	1	0.42	1	0.32	2	1.11	-1	-0.57*
30	When I buy a product, environmental compatibility is important to me.	1	0.30	-1	-0.13	1	0.59	-2	-0.93
14	Companies will be forced to work closely with their competitors to meet their sustainability commitments by 2030.	2	0.56	1	0.63	0	0.29	-2	-1.22*
35	There should be government subsidies for the production of sustainable goods.	0	0.23	0	-0.06	2	0.86	-2	-1.25*
3	Cooperation between competitors is only possible in the short term. In the long term, all market participants tend to be free riders	0	-0.21	2	0.70	-2	-0.72	-4	-1.61*

In addition to the statements that distinguish the four types of opinion from each other, there are, however, also statements that, regardless of the type of opinion, were equally classified with a particularly high or very low level of Agreement. For example, there is a consensus in the conviction that, in principle, too many things are bought that are ultimately not needed, and there is also Agreement that the respective consumer has a decisive influence on environmental and climate protection. Both statements were rated with a high scale point by all participants. There was also Agreement on one statement, which was rated by all with a low scale point, that companies are important economic actors and their role in achieving global environmental sustainability is important.

Table 19: Commonalities across all factors

Factor Scores with Corresponding Ranks		Factors							
No.	Statement	1	2	3	4	5	6	7	8
6.	People buy a lot of things they don't use. It would be sustainable if we only bought products that we really need.	2.61	1	1.19	5	1.68	2	1.07	11
19.	Consumer purchasing behaviour has a decisive impact on environmental and climate protection	2.42	2	2.02	1	0.07	19	0.89	13
16.	Businesses are important economic actors, but their role in achieving global environmental sustainability is not important.	2.17	39	-2.13	39	2.02	39	1.55	40

With regard to the aforementioned type classification, some participants were subsequently asked whether they saw themselves in the group to which they were assigned and whether they were convinced of the result. Almost all participants interviewed saw themselves fully in this group. They were also told that if they had already had the grouping and characteristics beforehand, they would have assigned themselves there. One participant did not see himself in any of the groups. This participant was assigned to group two. These basically see regulators in charge. According to the participant, his opinion was that he did not see regulators as responsible, but assumed that they basically determine the guidelines anyway. As a result, the assignment can be interpreted as wrong or right. In principle, the regulatory authorities play an essential role in group two. It does not matter whether they act compulsorily and prescribe laws or whether the participants want them to do so.

5. DISCUSSION OF THE RESULTS

This evaluation presents an empirical investigation of societal perceptions and attitudes towards sustainable products, as well as the responsibility of who contributes to them. The study shows that the production of sustainable products is supported by three pillars according to the opinion leaders. These include the actual consumers as consumers, the companies that produce and offer products, but also regulatory authorities that should oblige companies to act sustainably. For this purpose, the Q-methodology was conducted to reveal the basic opinion structures regarding sustainability and cooperation with competitors. Previous studies have only focused on the immediate consumption aspects by determining consumer perceptions of products. According to literature research, no study exists at this time that specifically addresses the perception of sustainability and co-opetition. However, these perceptions and opinions are fundamental in determining how co-opetition relates to sustainability reasons. The Q-approach used in this study produced four types of opinion, namely "Conscious leaders and committed managers", "Emotionally committed, but not strategists", "Modern leaders, business and sustainability are not contradictory" and "Mainly practitioners". The opinion patterns of the respective types show that different processes and influence assumptions, which are summarised under the concept of sustainability, appeal to different groups of people.

Increasing competition, innovations, efficiency, for example, are supported by type 1 "conscious executives and committed managers", while low-priced products and the influence of regulatory authorities are supported by type 2, the "emotionally committed, but no strategists". On the other hand, the opinion of type 3, the "modern executives, business and sustainability are not contradictory", is that it is important to know whether a product has been produced sustainably and whether the manufacturer can prove this if

necessary. They are also aware that the production of sustainable goods is more expensive and would therefore support state subsidies. In particular, people belonging to this opinion type believe that local products can offer good value for money and that organic products do not contain chemicals. On the other hand, type 4 "Mainly skilled workers" see rather advantages in an increasing cooperation of competitors by creating new markets and expanding existing markets and a merger based on cost savings. They also take a rather sober view of the automotive industry. You believe that the automotive industry is more concerned with profit than with the environmental impact on your business. In particular, you were sobered by the fact that people buy too many things they don't really need. This reinforces the image of a distinct consumer society. The consumer society can thus be seen in part as a fundamental cause of current environmental problems. However, the respondents believe that the consumer has a significant influence on the products offered and can significantly contribute to sustainable production, although the opinion prevails that sustainable products have their price, but that the consumer should be able to afford it. In fact, some respondents were of the opinion that these products should be offered at a lower price. Some of the respondents were even in favour of government subsidies. Overall, the approach of the Q-method thus reflects the hypotheses of research question *H1*, in which the demand for improved environmental awareness and the intensifying competition strengthen the merger between competitors. In particular, companies may want to reduce their costs and retain their customers with sustainability and care for the environment. *H2* can also be evaluated as correct, because it has been shown in the application of the Q-method that more experience with regard to cooperation and networks shows an increased willingness of companies to join forces with other value competitors under sustainability aspects. This hypothesis in particular could be confirmed on the basis of the experiences of the individual types, although the opinions differed with regard to the duration

of a tie with the respective competitor as well as under the sustainability goals of the 2030 Agenda. The resulting outcomes can already be observed in practice. The best example is digital networking. The cloud initiative "Catena-X", for example, should digitally map the entire value chain in the future. (Höpner and Kerkmann; (2023)) This is already being used by competitors "Volkswagen" and "Mercedes", for example. This example is already practice-related and not just part of scientific research. This means that the ways of thinking of a future environmental awareness and the associated customer loyalty are already being implemented in reality. *H4* was also confirmed, namely that companies that pay attention to the environmental and social impacts of their core business are more forward-looking, more risk-conscious and better positioned overall. The willingness to cooperate with a competitor is much higher. This was also shown by literature research on scientific articles as well as apparent cooperation with large companies. Here, mergers could be found on different levels. These include, for example, vertical or horizontal cooperation along a production chain or in R&D areas in order to share scarce and finite resources. This also leads to a confirmation of *H3* that companies that want to continue to compete in the market on their own have to expect higher loss rates. Since only companies that cooperate with market participants will have better market opportunities in the future. This can be confirmed especially in the area of research and development and the use of scarce resources.

In the overall context, cooperation with competitors is seen as positive and the sustainable production of consumer goods is seen as a joint task of companies, consumers and politics. All three groups are given equal responsibility in this. Basically, companies are required to extend product life cycles due to the scarcity of resources and to use finite production materials sensibly or replace them with innovative products. Some of the respondents expect the

government to set legal requirements in order to achieve the sustainability goals more quickly and, if necessary, to promote sustainable products through subsidies in order to relieve consumers. In particular, the influence of the government is not shared by all respondents. This is a fine line between paternalism and support.

6. NEW RESULTS

This paper contributes to the two core topics of coopetition and sustainability in the academic literature and presents new insights for coopetition research. The study systematically examines coopetition in the context of sustainability goals by focusing on influences and processes as well as outcomes. The findings show:

1. coopetition in the context of sustainability goals addresses different levels and actors also cooperate and compete at different levels simultaneously to achieve environmental, economic and social benefits.
2. the study presents the perspective of consumers and their demand for sustainability and implements this in the cooperation of competitors. Thus, from a scientific point of view, the topic represents a special form of consideration that has hardly been taken into account in the current scientific literature.
- 3 Furthermore, this study contributes to sustainability research by showing coopetition as an effective instrument.
4. the research also contains the insight that it takes more than just the cooperation of competitors to initiate sustainable processes.
5. the research topic shows coopetition in relation to sustainability goals, that competitors do not only want to join forces from an economic point of view, but also want to drive innovation through effective cooperation and optimise

the use of scarce resources within a co-competition and thus also want to and can expand their market shares.

6 Co-competition in relation to sustainability goals thus implies interactions between competitors, but also consumers as well as regulators.

The result of this study also shows that these common interactions are not contradictory, but contain interdependent behavioural characteristics that have grown over a longer period of time as a result of the 2030 Agenda and could become even stronger in the future as the year 2030 approaches and e.g. life cycle assessments of the individual countries in Europe are considered.

Co-competition and sustainability thus form an interdependence in which sustainability and co-competition requirements are interlinked.

As a result of this research topic, it is therefore suggested that sustainability must take into account economic, social as well as environmental concerns and that therefore different types of impacts, whether from a consumer or business perspective, can lead to positive outcomes.

By applying the Q-method, the results of the cooperation competition can be presented from different perspectives depending on the sustainability line, namely from the business perspective and from the social perspective, which is ultimately the consumer perspective.

7. CONCLUSION

The reason for the study was to close the research gap on the topic of cooperation in connection with sustainability goals. The evaluation of the study shows that the heterogeneity in the preferences and attitudes of fellow citizens should definitely be taken into account when it comes to raising awareness for sustainable products. The Q study also shows that the population is basically positively disposed towards sustainable products. Even if they see the influence of sustainability in different focal points. Their own knowledge about cooperation with competitors as a whole varies among the defined types, and this is reflected in the opinions expressed in the individual statements.

Although my dissertation topic is about cooperation with competitors, as a result of this, the influence on sustainability issues of the respective consumers on companies must also be sharpened in equal measure in order to include people who are sceptical about this topic. In particular, people who belong to this opinion group believe that behavioural changes by individuals have little impact on them. Accordingly, these people are less motivated to actively contribute. The intention of the people should also be examined more closely, what motivation they have if cooperation with competitors is only focused on from the profit aspect. They should also be motivated to strive for cooperation if it is not causally based on profit maximisation.

Even if the Q-Method has produced heterogeneous opinion patterns, it should nevertheless not be neglected that consumer society can partly be seen as the fundamental cause of our environmental problems today. Accordingly, greater importance is also attached to reducing consumption. All respondents believe that there could be many potential savings in everyday consumption if only those things were bought that are actually needed. This shows that only cooperation with competitors or the intervention of regulatory authorities or subsidies does not do justice to society's perception of sustainability goals.

The pursuit of sustainability goals is seen as a joint task of all stakeholders. The economy is also seen as having a relatively large responsibility to actively produce sustainably or to achieve the political sustainability goals and to promote innovations that contribute to this. However, the state is also seen as having a certain responsibility.

It can be stated that individually rational, short-term and thematically isolated courses of action by social groups inevitably lead to suboptimal results. Today, more than ever, political decision-makers have the responsibility to set the appropriate rules of the game; however, the game itself is determined by the feasibility in the respective companies and the conscious responsibility of consumers. Only in this way is there a chance to bring about substantial progress in the sustainability discussion, as is also inherent in the human, evolutionary-driven development process. (Hardtke, A./ Prehn, M., 2001).

In summary, the research objectives stated at the beginning of the study were achieved by answering the following research questions.

By applying the Q-methodology, the study was able to identify a framework of four types that have different views on consumer behaviour, sustainable production and cooperation with competitors. Their different attitudes lead to a greater or lesser degree of readiness on the topics surveyed.

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Leipzig, Germany, 03.07.2023

9. PUBLICATION LIST

9.1. The published publications relating to the topic of the dissertation

Doreen Kämpf; Coopetition in the Context of Sustainability Goals - A

Systematic Overview; Journal: *Regional and Business Studies*,
Editorial Board, H-7400 Kaposvár, Guba Sándor u. 40. e-
mail:rbs@uni-mate.hu

Doreen Kämpf; Competitor cooperation in the context of sustainability reasons
using the Q method; *Milton Friedm (Etzion, 2007)ann Egyetem*

Doreen Kämpf; Competitor cooperation, a case study of influence in relation
to sustainability; *Milton Friedmann Egyetem*

9.2. The published publications not relating to the topic of the dissertation

Wohllebe, Atilla; Hübner, Dirk-Siegfried; Kämpf, Doreen; Podrutzsik, Szilárd

Classification of Mobile App Users in Multi-Channel Retail - an
Exploratory Analysis *International Journal of Recent Contributions
from Engineering, Science & IT* 10: 1 pp. 4-16., 13 p. (2022) DOI
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Citing Journal Article (Article) Scientific*

Uwe, Radtke; Doreen, Kaempf Relation Heating System of Kaposvár and

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Koroseczné Pavlin, R; Madaras, Sz; Pál, L; Péter, K; Szócs, A;
Tánczos, L J; Telegdy, B (eds.) *Challenges in the Carpathian Basin :
global challenges - local answers : interdependencies or slobalisation?
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Kolozsvár, Romania : Editura Risoprint (2021) 1,337 p. pp. 1197-1215.
, 19 p. *Publication:32217839 Validated Core Citing Chapter in Book
(Conference paper) Scientific*

Uwe, Radtke; Doreen, Kaempf Lifelong learning-studying in the European
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LEARNING AND CHANGE* In press Paper: 10039866 (2021) DOI
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Scientific

Uwe, Radtke; Doreen, Kaempf; Relation between Urban energy systems -
analysis of smart metering district heating system of Kaposvár and
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Food Technology* 15: 3 pp. 59-65., 7 p. (2021) DOI Teljes dokumentum
Publication:31935518 Admin approved Core Journal Article (Article)
Scientific

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Case study of small and very small businesses in Germany during
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Journal Article (Article) Scientific

10. CURRICULUM VITAE

Doreen Kämpf, born on 21 June 1975 in Leipzig, Germany, completed a dual degree in business administration at the State Academy of Studies in Glauchau from 1994 to 1997, specialising in transport economics, and also successfully completed a Master's degree at the University of Applied Sciences in Merseburg in 2016, specialising in "Taxes - and Accounting". From January 2002 to August 2020, she worked as a finance officer at Mitteldeutsche Flughafen AG. She was then employed as Head of Finance at the Leipzig Chamber of Industry and Commerce and subsequently as Head of Budget at Merseburg University of Applied Sciences, a position she currently holds. Since September 2019, she has been a doctoral candidate at Mate University, Hungarian University of Agriculture and Life Sciences.

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