

Master Thesis

A Multinational Corporation and its Climate Change Strategies Through an Institutional Perspective



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1. Introduction

Businesses worldwide are increasingly confronted with challenges regarding the natural environment. One of the most salient environmental issues of our time is climate change, and it has gotten more attention worldwide from international environmental politics, the public and researchers (Baranchenko & Oglethorpe, 2012; Clark & Crawford, 2012). Given the global impact of climate change through global warming, increasing numbers of natural disasters and a change in biodiversity, this issue addresses every individual, country and business (Baranchenko & Oglethorpe, 2012; Fawzy et al., 2020; Flammer et al., 2021; Kim, 2022). Greenhouse gases (GHGs) are main drivers of climate change and nearly half are emitted by firms through combustion plants, manufacturing or construction activities which gives businesses an important role while tackling climate change issues (Littlewood et al., 2018).

As climate change impacts weather conditions which include the rise of temperature, extreme weather events and natural disasters in form of floodings, organizations require corresponding adaptation strategies to smooth climate-induced physical impacts on business activities and to build climate resistance (Tompkins et al., 2010; Weinhofer & Busch, 2013).

Despite the gravity of consequences and increasing pressure on firms, the climate-induced physical impacts on firms in form of damages through extreme weather events are rather unknown. These, as well as regulatory risks leads firms to deal with a high degree of uncertainty and an additional strategic issue (Backman et al., 2017; Baranchenko & Oglethorpe, 2012; Flammer et al., 2021; Kim, 2022).

Multinational corporations (MNCs) which operate globally face different regulations and policies. Therefore, firms can implement different type of strategies to address this issue. In the context of climate change, the strategies can be differentiated into two types: mitigation and adaption (Klein et al., 2005). The first refers to actions which aim at mitigating climate change through the reduction of GHG emissions. Adaption, however, deals with adjustments made in response to expected or actual climate change impacts. Measures in relation to climate change thus can be sorted into one of the two types (Pinkse & Kolk, 2012).

In the last decade, new (international) policies regarding climate change (e.g., Paris Agreement), increased attention of the public and pressure from nongovernmental organizations (NGOs) have resulted in firms to act. The automotive industry has to apply climate change measures not only in their supply chain but also reduce the emitted GHG emissions of their produced vehicles (PwC, 2007).

As suggested by (Winn et al., 2011) an institutional perspective is required to investigate the relations between climate change and organizational responses. But previously, many scholars have focused on stake- and shareholder theories (Chithambo et al., 2022; Clark & Crawford, 2012; Flammer et al., 2021; Herold & Lee, 2019; Littlewood et al., 2018).

So far research focused on the mitigation strategies of firms (Damert & Baumgartner, 2018; Kolk & Pinkse, 2004; Levy & Kolk, 2002), less on the adaptation strategies in regard to climate change (Linnenluecke et al., 2013; Pinkse & Gasbarro, 2019; Weinhofer & Busch, 2013). However, as climate change processes, the implementation of both types of climate strategies are important (Klein et al., 2005). The authors Damert and Baumgartner (2018) identified that the institutional environment and the supply chain position influences the implementation of mitigation strategies. Original equipment manufacturers are more ambitious than suppliers in the execution of mitigation measures (Damert & Baumgartner, 2018). Galbreath (2010) proves that institutional pressures have an effect on climate change strategies. Furthermore, Gasbarro and Pinkse (2016) focused on the adaptation strategies of firms in relation to the effects of climate induced physical effects. However, as most researchers focused on the question of what kind of strategies were implemented by companies to address climate change, only a few paid attention to the reason behind the decision to execute these specific strategies (Daddi et al., 2020; Goodall, 2008).

However, factors which also affect the implementation of the type of climate strategies, mitigation and/or adaptation, were identified to be climate awareness, sensitivity or vulnerability which proved to play a role in the decision making (Daddi et al., 2020; Gasbarro & Pinkse, 2016). The overall perception or climate change awareness of a firm on climate change thus influences the decision-making process accordingly. Thus, the view a company has on climate change needs to be taken into consideration as well.

Therefore, this thesis aims to contribute to literature by drawing on institutional theory, specifically the regulatory dimension of a MNC and the climate strategies they undertake. The goal is to get a better understanding of the reasons behind their actions, especially by the investigation of a MNC in the automotive industry as it is highly regulated (Damert & Baumgartner, 2018). This is why the following research question underlies this paper: How do regulatory pressures and climate awareness affect the mitigation and/or adaption strategies followed by a MNC? This allows to give further implications towards the design of policies for policy makers in order deepen the understanding of the effectiveness of regulations. Furthermore, the degree of the relevance of coercive pressures to drive climate strategies forward is estimated as the degree of the implementation of both climate strategies reflects the current standpoint on climate action. It aims to contribute to literature regarding climate strategies followed by firms, considering both mitigation and adaption strategies and by taking institutional theory into account as well as climate awareness. To answer this, a qualitative case study on Mercedes-Benz Group AG, a German vehicle manufacturer, is conducted.

The thesis is structured in the following way. First, an outline of relevant theories is presented to identify key concepts which include the institutional theory with its regulatory dimension, mitigation and adaptation strategies as well as the role of climate awareness. Second, the methodology is introduced by presenting the applied qualitative methods and further details on the case study. This is followed by the presentation of the results, the discussion, and conclusion which also includes the limitations of this research and implications.

2. Theoretical Background

2.1 Coercive pressures to mitigate and adapt to climate change

Climate change is an issue that involves several actors on a global scale in which scholars are invited to argue that the perspective of the institutional theory serves most promisingly for an explanation of a firm's environmental behaviour (Daddi et al., 2020; Wang et al., 2018). The institutional environment shapes and affects strategies of firms substantially, even though the exact effects are inconclusive (Wang et al., 2018).

Institutional theory revolves around the legitimacy issue of a company which leads to organisations resembling each other when they are located in the same institutional setting, known as institutional isomorphism (DiMaggio & Powell, 1983). The theory proposes that firms are embedded within institutional fields that include cultural, symbolic and regulatory dimensions (DiMaggio & Powell, 1983). By operating a firm according to institutional demands, it gains the right to perform business in a certain way which reflects the concept of legitimacy. Consequently, firms adopt practices that will help them obtain or maintain legitimacy (DiMaggio & Powell, 1983). According to Scott (1995) the institutional environment of a company exerts three types of pressures on firms: coercive, normative, and mimetic. Coercive, or regulatory pressures originate from i.e., regulations and laws, that provide explicit guidance to firms that can lead to sanctions if missed (DiMaggio & Powell, 1983). Imitating behaviour from firms which successfully attained legitimacy is described as mimetic pressure. Normative pressures originate from collective expectations, values and standards which are represented by e.g., NGOs or costumers (DiMaggio & Powell, 1983).

Taking previous research into account that investigated whether institutional pressures influence climate change strategies, results indicate the importance of coercive and normative pressures (Colwell & Joshi, 2013; Daddi et al., 2020; Galbreath, 2010; Wang et al., 2018). Considering the fact that several parties influence the policy making process which also include NGOs and lobbies (Doh & Guay, 2006), normative pressures can have an influence in the policy making process. Therefore, this study focuses solely on the regulative dimension of the institutional theory as most research considered all of them. However, it must be mentioned that all three pressures work together simultaneously which means that even if the focus is on one field, it doesn't indicate that the other two didn't have an effect (in-)directly on a firm's decision.

Coercive pressure by regulators intend to push forward climate change actions of firms. They have the power to implement regulations, laws and environmental standards which make the firms comply in their interest (Wang et al., 2018). Depending on the issued policies which may address or stimulate certain climate change strategies, like mitigation or adaption, firms may resemble each other due to institutional isomorphism (DiMaggio & Powell, 1983). This indicates that companies that share a home country, may result in similar climate change strategies.

As MNCs are embedded not only in their home country, but also in their host countries institutional environment, coercive pressures might differ from each other. Even though climate change is a global issue and international policies (e.g., Paris Agreement) exist, each country has the right to implement their own regulations to achieve the climate goals (Kolk & Pinkse, 2007). MNCs therefore implement climate action in compliance with the regulations they face in their home country. This, in turn, can explain the heterogeneity in climate change strategies between firms with different backgrounds, but also the homogeneity in firms with the same background. As previous studies proved, firms from different countries come up with different actions toward climate change (Damert & Baumgartner, 2018). But, one has to consider the aspect that the policies on climate change are very dynamical, meaning that perceptions and attitudes towards climate change alter over time (Ansari et al., 2013). This may result in a change of a MNEs strategy or behaviour as well in order to maintain legitimacy.

As Germany is an EU member, it must follow the issued regulations by the European Commission which are designed according to the Kyoto Protocol and recently the Paris Agreement. The European Union, in comparison to other nations which ratified the climate agreement is quick in implementing policies accordingly and particularly Germany set an ambiguous climate action program (Doh & Guay, 2006). This implies the high regulative pressure of a German MNC to implement strategies regarding climate change as its headquarters are located in Germany. However, as the climate change is a dynamic issue, changes in the institutional environment and thus institutional pressures can result in a divergence of strategies implemented by MNEs.

2.2 Adaption and Mitigation Strategies

Strategies which are specifically addressing climate change can be divided into adaption and mitigation strategies (Pinkse & Kolk, 2012). The United Nations Framework Convention on Climate Change (UNFCCC) first identified the two options and refers mitigation as measures to reduce or stabilize greenhouse gas emissions such as carbon dioxide, methane, and nitrous oxide and to enhance GHG sinks and reservoirs in order to prevent further climate change (UNFCCC, 1992, 2015). Adaption, however, is about “any adjustments that takes place in natural or human systems in

response to actual or expected impacts of climate change, aimed at moderating harm or exploiting beneficial opportunities” (Klein et al., 2005).

Mitigation and adaption strategies differ in their effect, costs and benefits, involved actors and goals (Klein et al., 2005). While the goal of a mitigation strategy is to mitigate climate change through the reduction of GHG emissions, adaptation aims “of enhancing adaptive capacity, strengthen resilience and reducing vulnerability to climate change, with the view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal (...)” (UNFCCC, 2015, Article 7, paragraph 1).

The focus in both research and policies were on mitigating the climate change and less about adaption (Daddi et al., 2020; Klein et al., 2005). While the Kyoto Protocol from 1997 (UNFCCC, 1992) centred about mitigation, the Paris Agreement from 2015 (UNFCCC, 2015) placed the importance of both adaption and mitigation strategies. This change emphasizes the importance of implementing both strategies simultaneously as mitigation measures cannot prevent the occurrence of climate change in the next decades as the impacts can already be felt and observed (Hulme et al., 1999; Klein et al., 2005). Therefore, measures for adapting to climate change (events) are as equally important but have rather high uncertainty due to the lack of knowledge and information regarding this. Researchers also emphasize the adaption of both strategies in firms as synergies can be developed which leads to additional benefits for the company (Klein et al., 2005).

The decision of which strategy to implement by firms is influenced by the underlying fundamental differences between mitigation and adaption measures. By giving a deeper look into each strategy, one can depict the reasons behind the decision.

As mentioned before, mitigation strategies involve actions which are aimed at mitigating climate change by controlling GHG emissions (UNFCCC, 2015). The effect of the mitigation can only be observed in the long run on a global scale (Daddi et al., 2020; Klein et al., 2005). Therefore, MNCs all over the world feel a responsibility to adopt or be involved in mitigation strategies due to the global impact and benefits (Daddi et al., 2020; Klein et al., 2005). Accordingly, firms, independently of their industry, engage in process improvements, R&D in climate friendly products and processes, sustainable transport, investing in renewables and financial incentives to

invest in the avoidance of deforestation (Glienke & Guenther, 2016; Pinkse & Kolk, 2012). An example is ExxonMobil, a gas and oil company that support the development of advanced energy technologies to reduce future emissions significantly (Hiatt et al., 2015, ExxonMobile. n.d.) or Walmart, a retail MNC, who works on reducing carbon dioxide emissions in their supply chain (Walmart, n.d.). Moreover, mitigation initiatives can be clearly determined in regard to costs and advantages because emissions can be measured and thus compared with each other (Klein et al., 2005). Additionally, even though mitigation strategies are followed by firms across industries, primarily the energy and transportation sector are entangled due to the (inter-)national policy making to instigate the industry to implement mitigation measures (Klein et al., 2005). This could lead back to the fact that these two sectors account for the majority of GHG emissions emitted by industry (Ritchie & Roser, 2020). Therefore, mitigation strategy is associated with predictability, measurability and are conclusive (Daddi et al., 2020). Previous research identified that firms operating in high-emission industries like oil and energy firms, or automobile brands adapted mitigation strategies (Damert & Baumgartner, 2018; Levy & Kolk, 2002).

Adaption strategies refer to measures undertaken which address the actual or expected physical impacts of climate change and result in climate resilience. This type of strategy only has an effect locally, at most on a regional level, and the measures take an effect immediately, unlike mitigation (Klein et al., 2005; Pinkse & Kolk, 2012). Furthermore, benefits of implementing adaption can range from the avoidance of monetary damages to saving human lives and natural values and are consequently harder to measure or compared against if comparing it to mitigation efforts. Therefore, the valuation of benefits can differ in political, economic or social contexts (Klein et al., 2005). As adaption can thus be described as a collective good which concern agriculture, human health and coastal vulnerability, several actors with different interests are involved. This makes decision making on adaption making extremely difficult due to the question of responsibility among others (Klein et al., 2005; Pinkse & Kolk, 2012). Because of this, firms do not see their responsibility to act on this matter (Klein et al., 2005; Swart et al., 2003).

It is undeniable that organizations have to adapt to climate changes as businesses are exposed to risks associated with weather conditions which can disrupt infrastructure and the supplement of resources, thus resulting in negative consequences on business

performance (Weinhofer & Busch, 2013). However, as adaptation is specific to place and context, businesses employ different strategies to address this matter (Berkhout, 2012). Therefore, adaption strategy depends on the exposure of a firm's climate risks which are determined by the industrial sector and the geographic region of operation (Weinhofer & Busch, 2013). Sectors which rely on seasonal and climate conditions or infrastructure are especially vulnerable. Consequently, farmers and agricultural firms, water (management) companies and railway firms were the first to implement adaptation strategies. Network Rail, the British operator of railway infrastructure, identified that adverse weather is a hazard for rail infrastructure, so an increase of resilience of railway infrastructure to high winds, flooding and extreme temperatures was planned (Tompkins et al., 2010). Another example is a hostel that improved isolation to keep the building cooler in summer or the installation of solar panels to heat shower water which reduces the reliance on national grid under flood or storms (Tompkins et al., 2010).

However, following an adaption strategy can involve R&D to deepen the understanding of threatened or vulnerable ecosystems in order to prevent (further) damage (Haller, 2021) and partnerships to co-create solutions which address the water cycle or agriculture (Danone, 2020). According to (Gasbarro & Pinkse, 2016), adaption can be divided into four types: pre-emptive, reactive, continuous and deferred adaption. The identified adaption behaviours depend on a firm's perceived risk awareness and vulnerability to climate-induced physical changes (Gasbarro & Pinkse, 2016). Pre-emptive adaption refers to firms which are informed about the consequences of the physical changes and consider having a high level of vulnerability. They act on an anticipatory stance by having impacts identified in relation to their assets which are located in a geographical area underlying for instance ecological changes (Gasbarro & Pinkse, 2016). The reactive adaption deals with applying measures after experiencing a climate-induced physical change (like weather extremes) which ended with financial damages. Consequently, the firm became aware ex-post that they are highly vulnerable to climate change (Gasbarro & Pinkse, 2016). Continuous adaption is applied by firms which have a high-risk awareness but classify their vulnerability as low due to established routines dealing with harsh conditions as they usually operate in locations with extreme natural conditions (Gasbarro & Pinkse, 2016). The last type, deferred adaption, is about those firms that have a low awareness and asses a low

vulnerability. They wait on future events to decide whether to take action as climate-induced impacts do not seem apparent considering current state of the art (Gasbarro & Pinkse, 2016). Scholars found that firms which heavily depend on large-scale infrastructures or are operating in climate sensitive areas are more likely to implement adaption measures such as oil firms (Gasbarro & Pinkse, 2016).

It is only a recent phenomenon for businesses to follow adaption strategies as it seems that firms are becoming aware of the fact that assets to respond to extreme weather events are indeed needed (Linnenluecke et al., 2013). But regardless of the damage a company might suffer from, adaption processes are required in the locations where business takes place (Pinkse & Kolk, 2012). However, climate change continues regardless, and benefits of adaption will increase, and the necessity will become more aware to all parties. This can be observed because policy makers slowly shift towards adaption measures (Klein et al., 2005; Pinkse & Kolk, 2012). Unlike adaption, mitigation strategies are not in an early stage anymore, so one can expect that companies may implement both strategies simultaneously and maybe even create synergies between them (Klein et al., 2005; Pinkse & Kolk, 2012). The more regulators push firms to adapt mitigation and/or adaption strategies, it is more likely that firms implement them.

2.3 The role of climate change awareness in the implementation of climate strategies

Previous studies identified factors that influence mitigation and adaption strategies of firms which include climate change awareness and perception (Gasbarro & Pinkse, 2016; Glienke & Guenther, 2016). It deals with how firms or major decision makers in companies perceive climate change or climate change risks and whether they are aware of the impacts of climate-induced changes for the firm and to what extent (Daddi et al., 2020; Gasbarro & Pinkse, 2016). Even though climate change is recognized to be a serious problem for humankind and thus firms as well, the extend and the choice how to deal with climate change depends on the awareness of it. The awareness of climate change is build up through the knowledge firms have about it, including the vulnerability the business activities face correspondingly, and the perception a company has on climate change. The actions firms undertake to fight climate change

also depend on the fact whether they feel a responsibility towards the issue and perceive it as a threat to their business operations.

In order to develop a fitting strategy in regard to climate change, a firm has to identify both the role of its own activities on the climate system and the climate risks which could threaten business operations. Thus, the first step is to get an overview of the GHG emissions of the firm itself and throughout the value chain. This way, companies are able to control, reduce and stabilize emissions. Depending on the stand of knowledge and information available for the firm, the awareness or perception can underly a change (Daddi et al., 2020; Gasbarro & Pinkse, 2016). Only by knowing about a risk can one act upon it and therefore decide which strategy to implement accordingly. Previous research, for example, proved that awareness has a positive relation to adaption (Gasbarro & Pinkse, 2016). Over time climate change proceeds to happen in which the exact impacts or events are better understood or predictable (Gasbarro & Pinkse, 2016). This is already seen if comparing the Kyoto Protocol with the Paris Agreement where the call for adaption methods is added next to mitigation (UNFCCC, 1992, 2015).

Concludingly, climate change awareness of the MNC can mitigate the decision making on which climate strategy (e.g., mitigation or/and adaption) to implement in regard of regulative pressures.

Figure 1 illustrates the rough relations of the key concept to another. The regulative dimension which includes the Paris Agreement, and the consequent national regulations influence the firm's climate strategy. However, the awareness of climate change which includes the knowledge of related risks may affect or mitigate the decision of the MNC whether to implement mitigation and/or adaption strategies.

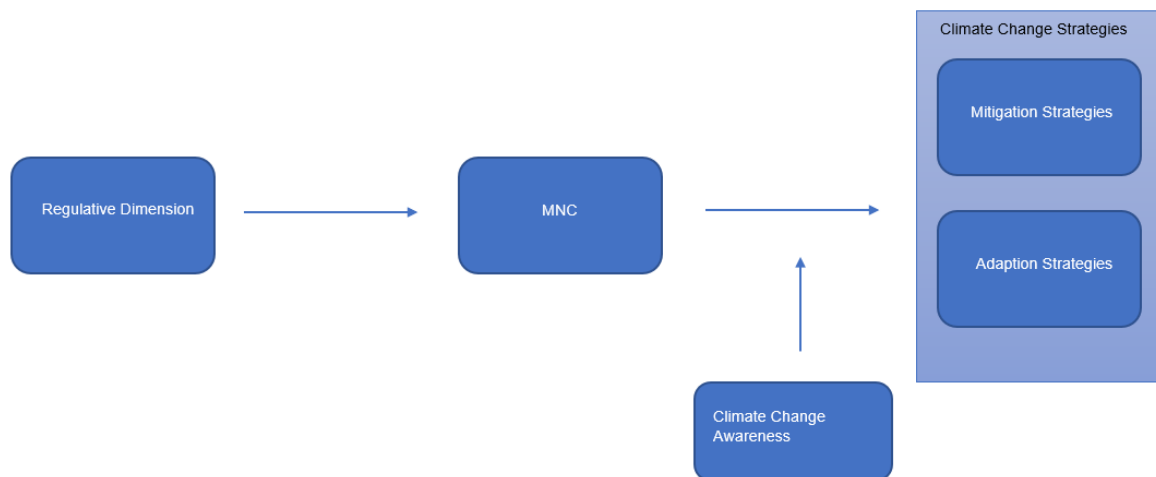


Figure 1 – Concept Model (Own Creation)

3. Methodology

3.1 Research Design

The research question aims to make sense of the relation between regulative pressures and the type of climate strategy a MNC follows and the underlying awareness of climate change. Therefore, the nature of the research question calls for a qualitative research method as an exploration of a phenomena is investigated. In order to understand the reasons of a firm to follow a certain climate change strategy.

Consequently, a longitudinal case study was conducted to get in-depth knowledge on the behaviour of a MNC in the automobile industry. This allows a deeper understanding to comprehend why certain decisions were made or strategies adopted in the context of climate change and the regulative environment of the MNC. The case study makes it possible to trace back measures undertaken by the firm, particularly the adaption of both mitigation and adaption strategies after the shift in the international policy from the Kyoto Protocol and Paris Agreement (UNFCCC, 1992, 2015) to investigate the relation between regulatory pressure and climate change strategies. Thus, the case study explores the measures of the firm undertaken before and after the Paris Agreement. Moreover, by focusing on one MNC, its perception on climate awareness can be analysed in-depth. This allows the investigation on how it affects the decision making on the actions undertaken to comply regulations.

A longitudinal case study of an MNC was conducted due several reasons which includes the dynamic legal frameworks regarding climate change (Regulation of 23 April 2009; Regulation of 17 April 2019; EU Commission, n.d.-a). Moreover, the automotive industry is particularly interesting as it belongs to the energy intensive sector due to production activities and the GHG emissions emitted along the supply chain (Damert & Baumgartner, 2018). Additionally, automobile firms have to make their products (e.g., vehicles) climate friendly by either lowering emitted emissions or selling zero-emission cars (e.g., electric vehicles). Thus, the pressure to implement mitigation strategies is especially salient in this sector. However, due to the global value chains and the established just-in-time production, vehicle manufactures are vulnerable to climate change induced events such as extreme weather conditions, which could delay or stop manufacturing activities at the production site (IPCC, 2012). Therefore, it is more likely that the firms in this industry are already or currently implementing adaption measures regarding climate change.

The choice to conduct a case study on this particular MNC is because of the institutional environment it is embedded in, but also because of their product range. Regulators such as the EU Commission or the German government aim to be leaders regarding climate action and have thus issued relatively strict regulations in comparison to Asian or American regulators (Doh & Guay, 2006).

Europe is known to have a strict course on climate change and regarded 'greener' in comparison to the USA (Doh & Guay, 2006). While the EU set fixed climate goals and ratified both the Kyoto Protocol (UNFCCC,1992) and Paris Agreement (UNFCCC, 2015). Moreover, to comply with agreements, the EU implemented the European Emissions Trading System (Directive of 13 October 2003) and the Eurpean Green Deal (EU Comission, n.d.-a). Even though Japan for example ratified the agreements, unlike the back and forth of the US, the implementation of Japan for example were lagging behind in adopting measures of the Kyoto Protocol in comparison to the EU (Kolk & Pinkse, 2007). Furthermore, the Climate Action Act of Germany which incorporates the goals of the Kyoto Protocol and Paris Agreement force companies located there to follow the regulations (Bundesregierung, n.d.).

Thus, by studying a MNC with a high regulative pressure in their home country, climate awareness and climate change strategies may be more pronounced and advanced to

maintain legitimacy. This provides a greater foundation to explore the linkage between regulatory pressures and climate change activities.

The study focuses on the period 2010 to now as the Paris Agreement in 2015 represents the shift of climate policy between mitigation to mitigation and adaption measures. This way the change in regulation and its effect on a firm's climate change strategy can be explored and better understood.

3.2 Case Context

I studied the German vehicle manufacturer Mercedes-Benz Group AG (formerly Daimler AG). It serves the premium and luxury segment of the market with its car division. Next to this, the firm is also selling vans, buses, trucks and mobility services. The firm with the Headquarters in Stuttgart, operates production plants and business subsidiaries worldwide with its products distributed to almost every country in the world (Mercedes-Benz, n.d.). Production facilities are in Europe, Latin- and North America, Asia and Africa (Mercedes-Benz, n.d.).

Being one of the biggest automotive companies worldwide, it has to face different regulations regarding to climate change. The MNC mainly followed a legitimization strategy as identified by a previous study which focused its research on the year 2006 (Shinkle & Spencer, 2012). The firm also acknowledged the issue regarding the GHG emissions and its responsibility to reduce the own emissions (Shinkle & Spencer, 2012). Moreover, it faced a significant challenge to reduce its vehicles CO₂ emissions as the MNC exhibited the highest CO₂ emission of Europe's top ten selling car brands (Reed & Schäfer, 2010). Furthermore, the MNC was rather late with its plan of launching electric vehicles on the markets in 2013 compared to other international competitors who introduced their models in 2010 (DPA, 2010). So far, the firm implemented different kind of climate strategies, especially regarding mitigation. Particularly interesting is the decision to go all electric where market conditions allow. This, however, only includes the cars and vans, not trucks and buses as this business unit was part of a spin-off in 2019 to become the Daimler Truck Holding AG (Daimler AG, 2019-a).

In the following the procedure of data collection and the methods to analyse the collected data are explained.

3.3 Data Collection

The research data underlies documents or text which includes sustainability reports (from 2011 to 2021), annual reports (from 2010 to 2021), TCFD questionnaires (from 2020 and 2021) and a published interview. However, as these documents are created and issued by the companies themselves and written for a specific audience, articles from media sources are included to gain credibility and for triangulation purposes (Yin, 1994). The media articles, totally 25, were collected from the Financial Times, New York Times, Reuters and the Deutsche Presse Agentur which range from 2010 until 2021. The articles were selected through Lexis Uni and it is important to mention that only those written in English were considered. Moreover, I had the opportunity to attend a podium discussion about climate change where a representative of the firm took part in. The generated notes were considered in the data analysis. The specific selection of the documents can underly a selection bias which can have an influence on the overall results (Yin, 1994).

3.4 Data Analysis

The first step in the data analysis was to read the text or transcript of the interviews to immerse and get an overview of the whole. Thus, relevant passages could be identified and text which does not relate to the research question neglected. The relevant passages were highlighted first before coding to enhance trustworthiness (Hsieh & Shannon, 2005). The analysis follows a directed content analysis, to draw on existing theory which was described earlier to create initial coding categories (Hsieh & Shannon, 2005). Therefore, a coding scheme was developed for operational reasons and to avoid conflicts during the coding process. The creation of the coding scheme underlies the findings of previous literature which are also part of the theoretical background chapter. The regulatory dimension proved to be a driver related to climate strategies according to Galbreath (2010), while Klein et al. (2005) identified the two types of climate strategies. The climate change awareness influencing the implementation of climate strategies were investigated in previous research of Daddi et al., (2020) and Gasbarro and Pinkse (2016). The coding scheme is displayed as Figure 2. During the analysis, about 700 codes under the category mitigation were created (Sub Categories: Cooperation (57), legitimation (14), Product development and innovation (480),

production and energy generation (49), supply chain (17)), about 13 codes under adaptation, 47 codes under awareness (Identification:14, Perception: 28, Vulnerability: 9) and 109 codes under regulatory (EU Vehicle Standards: 86, Paris Agreement: 6, EU Legislation for Climate Action: 17). Moreover, the paraphrasing of the selected passages allowed to emphasize the relevant information and for interpretation reasons when looking for a pattern. The next step is to code relevant passages according to the categories. During the coding process, comments were made in some cases to keep track of the specific context. An extract of the codebook can be found in the Appendix. Measures, where a distinction between climate change and environmental or sustainable actions could not be drawn were not coded due to the fact that the given information did not give away whether it included or were aimed at climate change. Additionally, actions aimed at improving air quality were not considered as the goal is to reduce harmful emissions for the human health, rather than the climate. New categories could emerge if any text cannot be sorted into the pre-defined one, but this was not the case. Furthermore, subcategories are identified during and after the coding process. This was done through the identification of returning patterns and repetitions which emerged during the coding process. The final sub-categories were defined after merging part of the initially identified sub-categories together. This step was undertaken due to the broad range of measures undertaken. Especially the sub-categories of mitigation had to be merged as they appeared to be too specific. Codes were only deleted when they could not specifically identified to relate to climate change. Additionally, the format is first temporarily ordered to get a chronological overview of specific events in regulation or policy making in order to get a better overview of the (historical) development.

Theory	Categories	Meanings/Operational Definitions
Climate Change Strategies		Strategies the firm undertakes that concerns climate change.
	Mitigation Strategy	A type of climate strategy that aims to identify and reduce GHG emissions. Its effects are observable in the long run and can be measured and compared against other mitigation measures.
	Adaptation Strategy	A type of strategy that aims to reduce physical climate impacts to business operations and builds climate resilience. Its effects are known immediately during or after the impact occurs. They are specific in location and context.
Climate Change awareness	Awareness	The knowledge about the firm's role in climate change and corresponding climate risks and perception of the firm in regard to climate change.
Institutional Theory	Regulatory	Policies which regulate or stimulate the climate actions of firms.

Figure 2 - Coding Scheme

3.5 Research Ethic

Moreover, one has to mention the researcher bias which may influence the coding process. As the automotive industry, including the analysed MNC, has had to recover from scandals regarding environmental issues and are not always described as doing sustainable business. Thus, the researcher's opinion might be biased due to media coverage in the matter. However, not being part of the customer base of the firms, no car owner, or having any mentionable relations with the firms may contribute to a rather objective perspective. Additionally, the selection of documents or secondary data may underly a selection bias (Yin, 1994), but the detailed documentation of the documents may mitigate this a bit.

Limitations in regard of this thesis include that the research underlies a case study which may not lead to the generalizability of the results to other MNCs. Furthermore, only the regulative dimension is accounted for and thus neglected other perspectives which are as equally important and should not be ignored.

4. Analysis

The case study aims at answering the research question on how regulatory pressures and the climate awareness effects an MNC's climate strategy. As presented in the theoretical framework chapter, the strategies were divided into mitigation and adaptation. Through a structured content analysis which involved the creation of a coding scheme, the documents were coded in respective to the pre-defined categories. The research design allowed for sub-categories to emerge after the coding process. These sub-categories made it easier to connect the relationships between each concept. Figure 2 displays the conceptual model after conducting the content analysis, highlighting the most prominent relationships between the categories. The initial climate strategies being divided into mitigation and adaptation were accounted for after the data analysis and a new category did not emerge.

Results show that in this case, regulators set the agenda for climate action, but leave the strategy on how to meet the regulations open to the firm giving them flexibility. Even though this allows the MNC to come up with an individual climate strategy in line

with the regulations, the priority of it is determined by regulators. Moreover, policies guided the company in its mission towards climate action through the establishment of standards and areas where additional attention is necessary.

The results suggest the categories regulatory, awareness, mitigation and adaptation. Mitigation measures includes the sub-categories product development and innovation, production and energy generation, cooperation, legitimation and supply chain. Adaptation measures only consist of risk management while the category awareness includes the identification, perception and vulnerability. Regulatory has the sub-category EU vehicle standards, EU legislation for climate action and Paris agreement. A more detailed overview the gives Table 4.

The chapter introduces the three time periods which present the mitigation strategy, specifically product development and innovation in relation to distinct regulations. This is followed by a detailed analysis of the other mitigation sub-categories, the category awareness and adaptation.

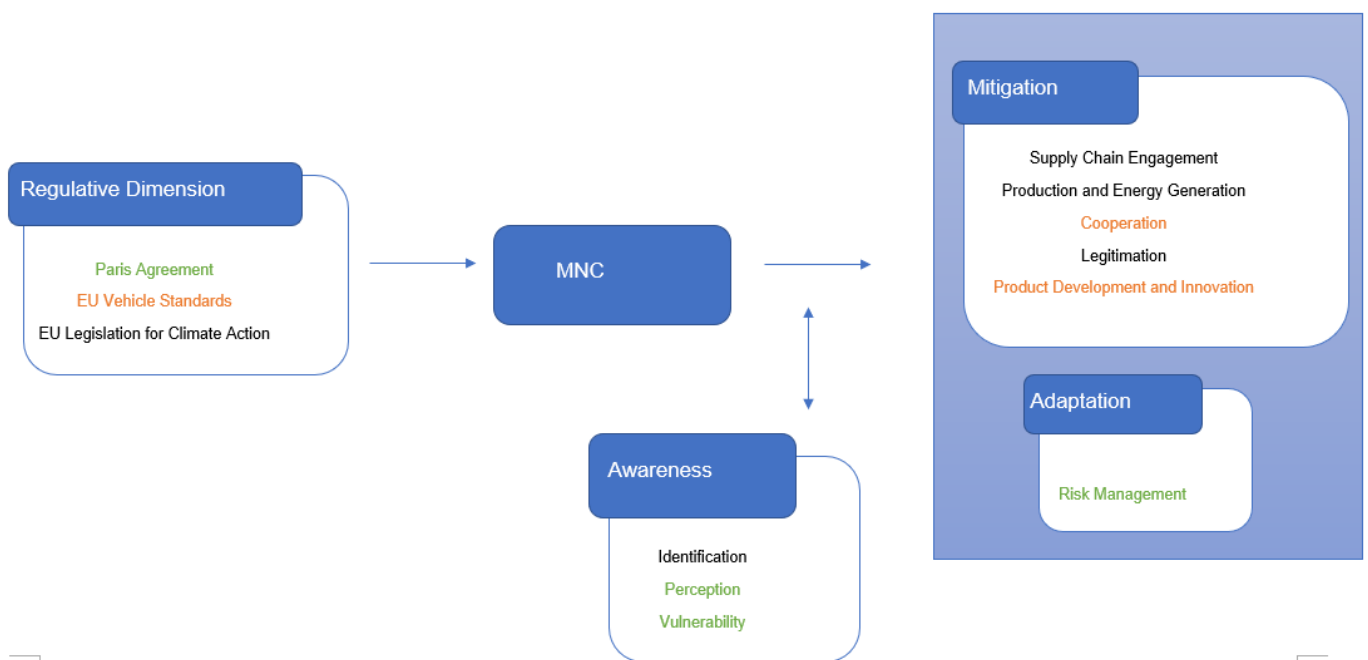


Figure 3 - Conceptual Model 2

Category	Sub-Category	Examples
Mitigation	Product Development and Innovation	Optimization of conventional drive systems, electric mobility, battery, resource conservation, car2go
	Production and Energy Generation	CO2 neutral production, construction of photovoltaic panels, limit energy consumption, purchase electricity of verified renewable resources
	Cooperation	Joint venture with Volvo to develop marketable hydrogen technology, strategic partnership with CATL to develop battery technologies, cooperation with Shell to expand charging network
	Legitimation	Scope 3 reporting, Climate reporting with Greenhouse Gas Protocol, participation in Carbon Disclosure project, verification of climate goals with Science Based Targets Initiative (SBTI)
	Supply Chain	Promoting climate protection with supplier awards, optimization of logistic network, supply of certificated CO2 neutral battery cells
Adaptation	Risk Management	Emergency plans and trainings
Awareness	Identification	Life cycle assessment, non-financial indicators,
	Perception	Responsibility to protect the climate, transition to CO2-neutral mobility is vital for climate change, climate protection is changing the business and company, mission to develop technologies for a CO2-neutral mobility
	Vulnerability	Water-related risks (flooding, scarcity etc.)
Regulatory	EU Vehicle Standards	Emission performance standards, CO2 fleet averages, average fuel economy
	EU Legislation for Climate Action	European Green Deal, Emissions Trading System (ETS)
	Paris Agreement	

Figure 4 - Overview of Categories and Sub-Categories

4.1 Regulations and corresponding mitigation strategy

4.1.1 2010 – 2015: Optimization of conventional drive systems

In the first period, the MNC implements a mitigation strategy which focuses on the CO₂ emission reduction of the produced vehicles during the use phase. This includes the optimization of combustion engines in regard to the emitted emissions and fuel efficiency, but also the development of hybrid drive systems and research in all-electric vehicles.

“We are optimizing the fuel efficiency of conventional vehicles. We are developing hybrid drive systems - particularly for large cars, buses and light-duty trucks for delivery service. And we are working on all-electric drive systems that use batteries and fuel cells.” (Daimler AG, 2010, p. 140).

“We will reduce fuel consumption and CO₂ emissions even more in the future with innovative technologies for locally emission-free mobility.” (Daimler AG, 2011-a, p. 94).

The emphasis of the climate change strategy on the reduction of the vehicles CO₂ emissions relate to the policies from the EU Commission in 2009 (Regulation of 23 April 2009). The regulations concern the CO₂ emissions and fuel consumption standards for cars and light commercial vehicles (2009). These were passed to align to the Kyoto Protocol. An overview of the exact timeline is displayed in Figure 5. The MNC was forced to comply by reducing the CO₂ emissions of their vehicles. This explains the implementation of the mitigation strategy on product development and innovation, especially because Mercedes-Benz had to reduce their emissions by 50% from 2010 until 2020 (Reed & Schäfer, 2010).

“In 2010, most of the new CO₂ legislation for light-duty commercial vehicles was passed in the European Union. The resulting targets constitute a long-term challenge in particular for Mercedes-Benz Vans.” (Daimler AG, 2010, p. 109).

“For example, the key elements of the European Union’s CO₂ Regulation, which came into force in mid-2009, call for a significant reduction in new cars’ CO₂ emissions already as of 2012, and for phased improvements whereby the average emissions of manufacturers’ entire fleets of new cars have to meet new limits by 2015.” (Daimler AG, 2011-a, p. 117).

In order to meet the regulations, conventional technology alone would not accomplish such a demand which creates the need to provide and further invest in alternative drive systems such as hybrid or electric vehicles.

"The increasingly ambitious targets require significant numbers of plug-in hybrids or cars with other types of electric drive." (Daimler AG, 2012, p. 129).

"We expect that we have to significantly increase our research and development spending in order to fulfill those requirements in the future." (Daimler AG, 2010, p. 109).

Even though the MNC considerate electric drive systems as part of their mitigation strategy, it is convinced that efficient conventional drive systems will still play an important role in the future.

"Clean and efficient internal-combustion engines will form the basis of mobility for a long time to come – also for vehicles with hybrid drive." (Daimler AG, 2010, p. 28).

"In spite of all of the efforts to develop alternative drive concepts, combustion engines will not disappear immediately. Although the number of new electric vehicle registrations is steadily increasing and the mix of automobiles on the road is becoming more diverse, most vehicles will continue to be equipped with combustion engines for many years to come." (Daimler AG, 2011-b, p. 66).

"Daimler is on the "road to emission-free driving." To this end, we have created an environmental roadmap that focuses on further efficiency enhancements to combustion engines, needs-based hybridization and locally emission-free electric vehicles with batteries or fuel cells." (Daimler AG, 2014, p. 3).

Despite the initiative "Road to emission-free driving", the MNC does not present any dates on which this is supposed to be achieved. Therefore, the need to switch to emission-free driving is acknowledged to mitigate climate change, but the urgency of the actual implementation is not.

4.1.2 2016 – 2018: Electric drive systems gain importance

The second period focuses on the mitigation strategy as well with the priority set for the reduction of CO₂ emissions of vehicles in the use phase. However, even though conventional drive systems still play a significant role, electric drive systems gain importance.

“We are increasingly focusing on the strategic areas for the future of connectivity, autonomous driving, flexible use and services, and electric drive, which we have given the acronym CASE (Connected, Autonomous, Shared & Services and Electric). We aim to occupy a leading position in these areas, both individually and by linking them up intelligently.” (Daimler AG, 2016-a, p. 178).

“We believe that combustion engines will continue to form the backbone of personal mobility until electric vehicles can achieve a breakthrough in the market. This is one of the main reasons why we continue to invest in the improvement of combustion engine technology, thus making a contribution to reducing the fuel consumption and emissions of each and every vehicle. At the same time, we have launched a broad-based electric-mobility offensive at all of our divisions.” (Daimler AG, 2017-a, p. 123).

Nevertheless, the firm announces its intention to offer all its commercial models with electric drive systems as delivery transport will probably be electric in future. This is one of the electric mobility offensives the MNC started.

“Mercedes-Benz Vans plans to offer all its commercial van model series with electric drive systems. The initial step was taken with the launch of the mid-size eVito in November 2018.” (Daimler AG, 2018-a, p. 110).

“Mercedes-Benz Vans believes the future of delivery transport will be increasingly electric, and it is making use of the modular system employed by Mercedes-Benz Cars for electric vehicles. Mercedes-Benz Vans plans the electrification of all its commercial model series.” (Daimler AG, 2017-a, p. 86).

A specific date on which the electrification of the commercial models is supposed to be complete is not given. Additionally, the company launched a new car brand which covers the all-electric vehicles, further emphasizing its goal towards an electric future.

“With its new product brand EQ, the company is launching an electric drive offensive in order to electrify vehicles in a variety of segments throughout the Group, from compacts to luxury class to vans, trucks, and buses.” (Daimler AG, 2016-b, p. 29).

“The electric offensive at Mercedes-Benz is accelerating. That’s demonstrated by the Concept EQA, the first all-electric EQ concept car of the Mercedes-Benz brand in the compact segment.” (Daimler AG, 2018-a, p. 17).

The strategic approach towards emission-free mobility, however, did not significantly differ from the previous period, even though it systematically electrifies its products. The MNC still counts on conventional drive systems in future.

“We are pursuing three different technological approaches as we move ahead on the road to emission-free driving: the further improvement of ultra-modern combustion engines, expanded hybridization, and locally emission-free vehicles with batteries and fuel cells.” (Daimler AG, 2018-a, p. 67).

New regulations regarding climate change, specifically aimed at the automobile industry, were not passed in this time period. But plans on regulations are announced to contribute to the Paris Agreement which significantly influences the strategy of the MNC. EU targets on CO₂ emissions of vehicles determine the internal goals which in turn influence the overall mitigation strategy.

“Very demanding Regulations for CO₂ emissions are also planned or have been approved for light commercial vehicles. This will present a challenge for Mercedes-Benz Vans, especially in the long term. (...). The proposals presented by the EU Commission in November 2017 for limiting the CO₂ emissions of light commercial vehicles, if confirmed by the EU Parliament and Council, are very ambitious.” (Daimler AG, 2017-a, p. 162).

“The new targets for the vehicle sector have not yet been finalized in-house because important conditions, in particular the details of the European CO₂ legislation for cars, have not yet been defined as binding Regulations.” (Daimler AG, 2017-b, p. 18).

“The new climate protection targets for our vehicles are currently in the internal coordination process. Details of new European CO₂ legislation for cars and light commercial vehicles were released in December 2018. A final decision will also soon be made about reduction targets for trucks and buses (..) and we will now focus on meeting the associated requirements.” (Daimler AG, 2018-b, p. 14).

This emphasizes the orientation of climate strategies on regulative pressure as it leads to the priority of specific climate measures, in this case the

Moreover, the announcement of further regulations of vehicles implies the need of alternative drive systems such as hybrids and electric vehicles in order to fulfil them.

“In the European Union, the EU Commission made an ambitious proposal in November 2017 on future Regulations concerning the CO₂ emissions of new vehicles (period of 2021 to 2030). (...) Daimler gives these targets due consideration in its product planning. The increasingly ambitious targets require significant proportions of plug-in hybrids or cars with other types of electric drive.” (Daimler AG, 2017-a, p. 161).

Regulations, therefore, not only drive mitigation measures of the MNC, but also speed up the whole process and lay a foundation to tackle the policies.

4.1.3 2019 – 2021: Only electric drive systems where markets allow

The mitigation strategy in this period underlies a change compared to the previous time periods. This relates to a change in the legal framework in the EU regarding climate change. It calls for climate neutrality during the whole product-lifecycle.

“For example, we have set ourselves an ambitious climate protection goal along the value chain: to make our entire new vehicle fleet CO₂-neutral by 2039. It encompasses climate neutrality at our suppliers, CO₂-neutral production in our production facilities worldwide and the CO₂-neutrality of our vehicles during the use phase.” (Daimler AG, 2021-a, p. 29).

In 2019 new regulations regarding the vehicle CO₂ emission standards for cars, light commercial and heavy-duty vehicles were passed to align the Paris Agreement (Regulation of 17 April 2019). This was regarded as a challenge from the automaker. The strategy shifted towards an electric future, prioritizing the launch and development of electric vehicles, instead of optimizing combustion engines.

“By means of our “Electric First” strategy at Mercedes-Benz Cars, we are systematically moving toward CO₂ neutrality.” (Daimler AG-b, 2020, p. 3).

“One of our most important concerns is the reduction of CO₂ emissions. With “Ambition 2039,” we have set ourselves challenging targets. For Mercedes-Benz, for example, this means that we aim to have a CO₂-neutral new passenger car fleet worldwide by 2039. With this, we are focusing on the entire lifecycle of our vehicles — from their development to the extraction of raw materials, to production and use, and to their disposal. To achieve this, we are prioritizing the electrification of our vehicles.” (Daimler AG, 2019-b, p. 3).

In 2021 Mercedes-Benz announced to leave combustion engines and hybrids behind, following an all-electric vehicle strategy.

“In order to achieve its long-term climate-protection goal of becoming CO₂-neutral by 2039, Mercedes-Benz is planning the complete electrification of its product range. By the end of this decade, Mercedes-Benz wants to be all-electric wherever market conditions allow.” (Daimler AG, 2021-b, p. 5).

“Mercedes-Benz is accelerating the transformation to an emission-free, software-driven future with this strategic step from “Electric first” to “Electric only”.” (Daimler AG, 2021-a, p. 98)

Even though it cannot be excluded that other institutional pressures had an influence on the strategic orientation of the MNC, coercive pressure however, played a significant role.

“Of course, one important driver of this transformation are the legal Regulations, including the discussions of driving restrictions for vehicles with combustion engines.” (Head of Strategy Development & Strategy Intelligence, Daimler AG, 2021-b, p. 32).

The fact that the MNC acknowledges the fact that the fulfilment of the regulations are only possible through alternative drive systems emphasize the high coercive pressure it faces.

“The transportation sector as well must significantly reduce its CO₂ footprint in the years ahead. For example, the climate protection plan of the German government requires the transportation sector to reduce its greenhouse gas emissions by 40 to 42 percent by 2030 compared to the levels of 1990. The legal requirements for Europe as a whole are similar. (...) We can only reach this target value if we put a large enough number of all-electric vehicles or plug-in hybrids on the road.” (Daimler AG-b, 2019, p. 94).

Especially the negative consequences of the regulations push the mitigation strategy of the MNC towards electric vehicles.

“Non-compliance with Regulations applicable in the various markets might result in significant penalties and reputational harm, and might even mean that vehicles with conventional drive systems could not or could no longer be registered in the relevant markets. The Mercedes-Benz Group counteracts these risks by with the transformation

towards electric mobility and the associated realignment of its products.” (Daimler AG, 2021-c, p. 6).

Moreover, the announcement of the European Green Deal to keep the progress of climate action in compliance with the Paris agreement, signals the MNC that it has to face even more drastic measures (EU Commission, n.d.-a). This plays a part in the strategic switch as well.

Even though the company was convinced in the future of combustion engines, the switch to offer only electric vehicles where market conditions allow it, represents a strategic change by considering regulations. The policies call for a significant reduction in CO₂ emissions which is only possible by gradually shifting the product portfolio towards electric vehicles. Even though the policies do not demand a complete transition to electric mobility, it certainly pushes into that direction. As Mercedes-Benz serves the premium segment vehicle market, customers are accustomed to higher prices, making it easier for them to switch to electric vehicles in their product range even if costs are higher due to the novelty of the technology.

4.2 Mitigation measures

4.2.1 Production and energy generation

Moreover, next to the reduction of CO₂ in vehicle emissions, the MNC implements mitigation measures in production and energy generation. This includes the generation of energy from renewable sources and efficient energy management.

“With the help of environmentally friendly production methods, we have succeeded in recent years in reducing our plants’ energy consumption, CO₂ emissions, production related solvent emissions and noise pollution.” (Daimler AG, 2012, p. 101).

“Daimler is also steadily expanding its in-house energy production activities with the aim of achieving more efficiency. To this end, the company has analyzed all of its facilities — for example, with regard to the use of efficient combined heat and power generation systems or the generation of energy from renewable sources.” (Daimler AG, 2013-b, p. 20).

Furthermore, it includes the goal to completely rely on CO₂-neutral energy at production plants in Europe and the consideration of the energy supply when constructing new facilities.

“Another important aspect is climate protection at our production plants. Mercedes-Benz Cars is setting the course for green production in Germany and Europe. Plans call for all manufacturing facilities in Germany to be supplied with CO₂-neutral energy by 2022. The preparations for the exclusive use of green electricity for a climate friendly production in Europe are already well advanced.” (Daimler AG, 2018-a, p. 112).

“When we plan new plants in Europe, we now make sure from the very beginning that they will have a CO₂-neutral energy supply.” (Daimler AG, 2018-b, p. 27).

“Factory 56 will serve as a blueprint for all future vehicle assembly operations at Mercedes-Benz Cars worldwide. It obtains its energy from CO₂-neutral sources that include a photovoltaic system installed on the roof.” (Daimler AG, 2018-a, p. 170).

“Moreover, all of the car and battery assembly locations operated by the Mercedes-Benz Group will have climate-neutral production processes from 2022.” (Daimler AG 2021-b, p. 148).

The fact that the focus is on getting the production plans in Europe CO₂ neutral first, emphasizes the higher regulatory pressure there. However, regulations directly aimed at reducing GHG emissions in production facilities or business activities do not really exist. The ETS may include the production plants of the company in the EU, but emission targets and limits like with vehicles are not the case (EU Commission, n.d.-b). The ETS may stimulate firms to reduce their carbon intensive operations, but the level of urgency compared to regulation on vehicle emissions is relatively low. Thus, climate-neutral production therefore seems to only be a secondary goal as the products were prioritized in the mitigation strategies.

4.2.2 Supply Chain

Mitigation measures regarding the supply chain in this period mainly include the optimization of transport networks through the connection of transport hubs, for example.

“In order to reduce the associated CO₂ emissions, we are working hard to optimize the logistics network. Our main target here is to optimally connect the transportation hubs with one another so that the distances can be reduced and capacity can be better utilized. Innovative transportation concepts and new transport systems also play a major role here.” (Daimler AG, 2015-b, p. 61).

Along with the mitigation measures of production facilities, the MNC aims to create a climate neutral value chain, beginning with the supply of CO₂ neutral materials and aid suppliers with CO₂ reduction.

“We are cooperating closely with our most CO₂-intensive suppliers to also identify effective CO₂ reduction measures in this area.” (Daimler AG, 2019-b, p. 39).

“The production of these battery cells is CO₂ neutral, which enables us to reduce the emissions for a cell by about 30 per cent. The inspection and certification organisations SGS and DEKRA have examined and confirmed that the cells are manufactured in a CO₂ neutral manner by the suppliers.” (Daimler AG, 2021-b, p. 146).

4.2.3 Cooperation

Additionally, the mitigation strategy also includes cooperation with other organizations. These cooperations in form of joint ventures or strategic partnerships, support the MNC on their measures regarding product development and innovation. The electric drive systems which either contain batteries or fuel cells require enhanced research before being series-produced. Through cooperations, the MNC is able to share research costs and accelerate the commercialization of electric vehicles.

“Together with Ford and our strategic cooperation partner, Nissan, we continue to move ahead with the commercialization of fuel-cell vehicles.” (Daimler AG, 2013-a, p. 30).

“Daimler and Robert Bosch GmbH sign agreements on the establishment of a 50:50 joint venture for electric motors. The company will operate under the name of EM-motive GmbH and will develop and produce innovative electric motors for electric vehicles.” (Daimler AG, 2011-a, p.8).

Furthermore, alternative drive systems require a complementary infrastructure which provide charging or hydrogen stations. The establishment of such an infrastructure requires the cooperation with other organizations.

“We are cooperating with leading industrial companies on the expansion of the hydrogen filling station network in Germany in order to set up the infrastructure needed for fuel cell vehicles.” (Daimler AG, 2014, p. 67).

“With the establishment of their joint venture, H2 MOBILITY Deutschland GmbH & Co. KG, the companies Air Liquide, Daimler, Linde, OMV, Shell and Total have set the

stage for a phased expansion of the hydrogen filling station network in Germany. Plans call for approximately 400 new stations to be built in Germany by 2023.” (Daimler AG 2015-a, p. 61).

“Daimler AG, the BMW Group, Ford Motor Company and the Volkswagen Group with Audi and Porsche plan to establish a joint venture to create the most effective charging network for electric vehicles in Europe.” (Daimler AG, 2016-a, p. 80).

4.2.4 Legitimation

Moreover, the firm follows the legitimation of its practices as well, through climate reporting and verification of its compliance towards the Paris Agreement. The disclosure of GHG emission data according to the Greenhouse Gas Protocol and the annual report in line with the Global Reporting Initiative (GRI) gives the MNC transparency and legitimacy of its operations.

“The report was drawn up in line with the Global Reporting Initiative (GRI) guidelines 4.0. In this context, Daimler specifically highlights all of the company’s key sustainability related issues. This applies in particular to focal topics such as further reductions in the fuel consumption of our vehicles through hybridization (...).” (Daimler AG, 2014, p. 102).

“Daimler is also one of the first industrial companies to publish CO₂ emission data in accordance with the standards of the Greenhouse Gas Protocol (GHG). Along with the emissions produced by our own energy and heat generation activities (Scope 1) and from the external procurement of electricity and district heat (Scope 2), we also take into account upstream and downstream emissions that result from our business activities (Scope 3).” (Daimler AG, 2015-b, p. 32).

Furthermore, the reporting according to internationally accepted standards additionally makes the data more reliable and comparable in comparison to other firms.

The MNC also emphasizes its commitment towards the Paris Agreement through the verification of its compliance towards the Paris Agreement.

“Mercedes-Benz AG has had its climate protection measures scientifically confirmed by the Science Based Targets Initiative (SBTI). By means of these targets, the

company would like to make a contribution to environmental protection in line with the Paris agreement on global climate change.” (Daimler AG, 2019-a, p. 100).

Therefore, the mitigation strategy is focused on the product development and innovation, especially the optimization of combustion engines and the development of alternative drive systems. Other measures, represented by the sub-categories, complement, or support the overall strategy to reduce vehicle emissions and towards climate-neutrality.

Even though it cannot be excluded that other institutional pressures had an influence on the strategic orientation on the firm, coercive pressure however, played a role by shaping it. The overall mitigation strategy is guided by regulators, making the company realize where action is needed to protect the climate. Through the strategic step to offer alternative drive systems in the product range, opportunities in new markets were made possible. Moreover, the cooperation with other firms to work together on optimizing combustion engines or sharing research costs to make innovative technologies marketable allowed the firm to explore new possibilities alongside their core products.

Therefore, the regulations pointed the firm on where actions have to be undertaken and how urgent the issue is, but the exact measures undertaken depend on the firm itself.

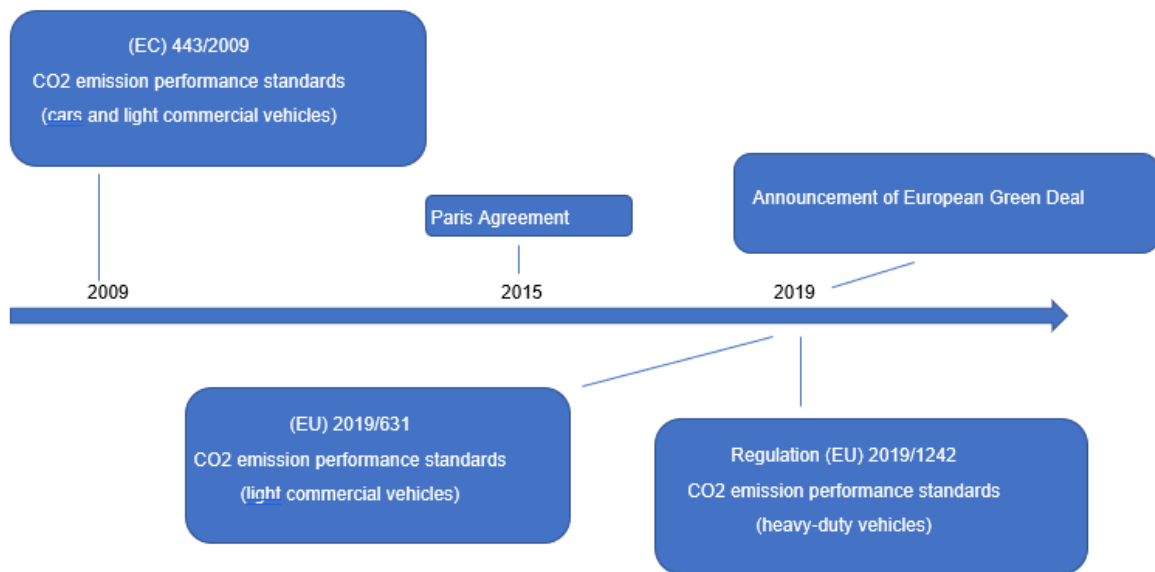


Figure 5 - Timeline of the most important policies

4.3 The awareness of climate change, the Paris agreement, and its relation to the adaptation strategy

4.3.1 Perception and Identification

The MNC recognizes that climate change is an environmental issue that needs to be addressed through climate actions. It also acknowledges the fact that the firm is responsible for its contribution towards climate change as well.

“Our goal is emission-free mobility. The automobile is entering a new era. Oil reserves are finite, and their use is contributing to climate change. At the same time, the need for mobility is growing worldwide, and individual transport is steadily increasing, with associated effects on the climate and the environment in general. Our aim is therefore to substantially reduce our vehicles’ fuel consumption and emissions here and now, and to completely eliminate them in the long term.” (Daimler AG, 2010, p. 140).

“Sustainability and, in particular, environmental and climate protection are among the most urgent issues of our time.” (Daimler AG, 2021-a, p. 27).

“The transition to CO₂-neutral mobility is vital if the impact of climate change is to be limited. We at Daimler are working hard to make this vision reality.” (Daimler AG, 2019-a, p. 100).

The responsibilities the MNC has on climate change shapes its climate strategy. The strategic step towards an all-electric future may have influenced this decision as the firm recognized that climate change is one of the most urgent issues currently.

The identification of CO₂ sources or the risk of a climate induced physical impact are needed to implement a corresponding climate change strategy. The MNC conducts a lifecycle assessment to get an overview of the products carbon footprint.

“To make a vehicle more environmentally friendly, its emissions and resource consumption must be reduced throughout its entire life cycle. The standardized tool for evaluating a vehicle’s environmental performance is the life cycle assessment, which examines all of the ways a vehicle impacts the environment, from raw material extraction and vehicle production to product use and recycling.” (Daimler AG, 2011-b, p. 71).

“Furthermore, within the context of our sustainability management, we use other non-financial indicators such as the CO₂ emissions of our vehicle fleet or the energy and water consumption of our production sites.” (Daimler AG, 2013-a, p. 80).

Moreover, climate-related risks are identified through the recommendations of the TCFD.

“Climate-related risks and opportunities in connection with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) are part of the environment area and are thus also identified and assessed as part of the risk management process.” (Daimler AG, 2021-a, p. 131).

4.3.2 Adaptation Strategy

The Paris Agreement in 2015 can be interpreted as a turning point where not only the goals to mitigate climate change were determined, but also the implementation of adaptive measures to become climate resistant. The MNC was aware of the fact that natural disasters are a risk factor for production and business processes, but a relation to climate change was not drawn.

“Production and business processes could also be disturbed by unforeseeable events, such as natural disasters (...).” (Daimler AG, 2010, p. 110).

However, the international treaty draws attention to the issue of climate change impacts in from of more frequent extreme weather events, signalling that even though

mitigation measures are necessary, the adaptation to climate change is as well. This probably caused the firm to become aware of adaptation. Therefore, the first step is to identify the level of vulnerability in order to implement corresponding measures in form of a strategy. An evaluation of business locations with water-related risks was made which is integrated into the existing environmental risks evaluation. The firm concludes that their own businesses were not highly valuable, setting down with general emergency and training plans.

“At the Mercedes-Benz locations, we also evaluate water-related risks as part of our environmental risk assessments that take place every five years. The focus is on water extraction, discharge, flooding, scarcity and contamination. If necessary, remedial measures are initiated and their implementation is monitored. This ensures that technical and organisational risks are reduced in a demonstrable manner. Based on the assessments made over the past five years, only a few locations that suffered from water stress were identified.” (Daimler AG, 2021-b, p. 177).

“In addition, climate-related risks and opportunities are integrated into the Group-wide risk management process at Daimler.” (Daimler AG, 2020-c, p. 2).

In this case, international climate policy made the company conscious of a problem which enhanced the awareness. However, how the firm deals with it is left open by regulators.

The strategy of the Mercedes-Benz Group to emission free driving through the optimization of conventional drive systems, plug-in hybrids and the development of marketable electric drive systems, advanced in a higher speed due pressing and ambitious coercive pressures. The broadly ranged mitigation measures implemented are also in line with Damert and Baumgartner (2018) who identified this phenomenon in European original equipment manufacturers in the automotive industry. This can be explained by the fact that the mitigation actions are aligned or connected with each other, making it possible to create synergies. As the reduction of the vehicle's emissions are unavoidable, the electrification of the products also requires the corresponding infrastructure. Moreover, to cut costs in the development of climate-friendly products and to build a charging infrastructure allows the cooperation with other organizations. Additionally, the actions to move towards a carbon-free production, not only require the documentation and the identification of carbon sources, but also

the investment in renewable energy. Moreover, coercive pressure can lead a firm to decide priorities. This was observed by focusing the mitigation strategy on the products, but also the fact that the European production is to become CO₂ neutral first.

5. Discussion and Conclusion

The results show that by analysing the influence of regulatory pressures on both types of climate change strategies, the respective firm prioritizes its climate change measures on the fulfilment of regulations and uses policies as a guide for orientation. This enhances the speed of the implementation of climate strategy on firm level. Moreover, as the awareness of climate change plays a role in shaping undertaken climate actions, regulations can help the firm to become aware of neglected climate issues that received less or no attention by the company before being picked up by policy makers. The fact that other measures undertaken are build up upon the mitigation strategy to emission free driving like the construction of a charging infrastructure or the engagement with suppliers which support the climate goals of the firm. Thus, the implementation of a climate strategy depends on the degree of coercive pressure it receives and the awareness of the existence of a climate issue.

5.1 Implications for the governance of climate adaptation

Results show that adaptation measures are implemented in the firm's risk management system. This may be due to the fact that the perceived risks in a risk assessment shows a lower vulnerability. Therefore, the company probably decided to not give it a special attention, but deal with it in a standardized manner by integrating it into the risk management system. Weinhofer and Busch (2013) observed similar behaviour, stating that firms after conducting a risk assessment which shows the small impact of such a risk occur, made little effort to address any risk response. However, this can also be due to the missing experience as a firm did not experience climate induced physical impacts yet (Pinkse & Gasbarro, 2019). Also, risk assessment relied on external tools which emphasizes the fact that businesses do not have substantial data to determine their level of vulnerability to climate events. This goes along with the findings of Weinhofer and Busch (2013) who stated that firms rely on the information available on climate change for their climate risk management. As reports like the IPCC may presents information about the effects of climate change, these are reported on a macro-level. Therefore, it is difficult for firms to translate these information on their own

business activities which not only creates uncertainty, but also influences the results of risk identification and assessment (Pinkse & Gasbarro, 2019). Further research in the field of climate research which can be used by firms is necessary. The fact that Mercedes-Benz adjusts its internal climate goals to the Paris Agreement implies that it orients its strategy on decisions of policy makers, rather than scientists.

But regulations influenced the awareness because only after adaptations were part of policies, did the firm undertake a first step towards climate adaptation. As an vehicle manufacturer, Mercedes-Benz does not fall into the industry which experience climate change as one of the first, unlike farmers who have to deal with the changing climate due to their crops (Linnenluecke et al., 2013). Therefore, it becomes aware of climate adaptation in a later period. Moreover, the fact that mitigation measures are more urgent due to the vehicle regulations, adaptation was less prioritized. This could serve as an explanation of the rather late actions towards climate adaptation.

Nevertheless, the rise in awareness of the necessity of climate adaptation strategies happened, at least in this case, with the help of the Paris Agreement and European Legislation followed by it.

5.2 Implications for managing mitigation measures

The active engagement in climate mitigation supports the evidence of previous research (Damert & Baumgartner, 2018). This is probably linked to the attention of regulators on the firm located at the end of a supply chain. These face more regulations than suppliers (Damert & Baumgartner, 2018). However, the broad range of measures could also be a result of different regulatory pressures due to the high level of internationalization which requires the MNC to comply to divergent regulatory frameworks (Damert & Baumgartner, 2018).

Furthermore, the subcategory legitimation which deals with climate reporting, emission trading (ETS) and standards verified by third parties gives transparency over the outcomes of the mitigation measures. The implementation of such a strategy is in line with other research (Cadez & Czerny, 2016; Damert & Baumgartner, 2018). However, the results in this case show that the firm does undertake measures to cut emissions and does not follow the simple mitigation strategy of legitimation, unlike the conclusions of Cadez and Czerny (2016). This contradiction may origin in the time period observed and the fact that this study underlies a single company.

The awareness of climate change leads the firm to acknowledge the need and their own role to mitigate climate change. The strategic step to prioritize electric mobility and to engage with supply chain members towards a carbon neutral product underscores the importance of the perception towards climate change as such measures go beyond current regulations. However, it is also possible that these actions were partly done out of competitive reasons as the ongoing transformation of the automotive industry determines the future of the company.

5.3 Praxis

For policy makers this case study gives some insights on how their decisions affect climate change strategies of firms. Even though the results should not be generalized as the study revolves around a specific company, conclusions can still be drawn. So, regulations can be aimed to speed up climate actions where a higher urgency is observed or where firms are still hesitant and rather unaware of an existing problem. Furthermore, policies can guide and aid firms towards the implementation of climate strategies (Gasbarro & Pinkse, 2016; Pinkse & Gasbarro, 2019). These can include the promotion of carbon neutral supply chains, but also to climate reporting and to take away the uncertainty firms face in climate adaptation through the provision of relevant data and other type of aid.

Research in future can provide further insight of the effectiveness of adaptation regulations by regulators as Tompkins et al. (2010) already suggested, but also of mitigation strategies. Furthermore, research of the interactions between policy makers and firms could provide further insight. Also, the relationship between the competitive advantages such as the availability of internal resources and climate strategies could perhaps give more insight of the implementation of climate strategies.

That climate change is an urgent issue is undeniable, but in order to succeed in the mitigation of climate change, policy makers play an important role. The fact that Europe has a rather stringent legal framework for climate action, emphasizes the fact that in some countries in the world, climate strategies of firms are less ambitious and pronounced. International policy makers should encourage climate regulations worldwide.

5.4 Limitations

As a case study was conducted, the results reflect the behavior of a specific company. Thus, a generalization of the results needs to be done in a cautious manner. Furthermore, the study does not include any interviews which could give further insight of the climate strategies and the decisions behind its implementations. Therefore, it is possible that information was not processed which could influence the results of the analysis conducted. Moreover, by only focusing on the regulative dimension, the effects normative or mimetic pressures have been left aside. The results observed could therefore represent the interplay by all pressures together. Additionally, the implemented strategies could also be influenced by the internal resources the firm has. Mercedes-Benz as the inventor of the automobile represents its strength in innovations, making it likely for them to comply regulations with the help of a heavy investment in research and developments. Thus, if the competitive advantages of companies differ, different strategies are implemented.

5.5 Conclusion

The thesis investigated how coercive pressures and climate awareness affect climate strategies of an MNC. The strategies can be divided in climate change mitigation which revolves around the reduction of GHG emissions and climate adaptation, to build climate resistance. By conducting a case study of a German vehicle manufacturer, the results show that regulative pressures shape climate strategies by prioritising the implementation of specific measures, giving guidance and orientation of climate goals and raising awareness of neglected climate issues. As policies change over time and new, more stringent regulations were recently passed, the development of this whole topic is still very dynamic.

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Appendix

B	C	D	E	F	G	H
Individual/Publisher	Year	Document	Meaning Unit	Para.	Category	Sub-Category
	2010	AR/10	Clean and efficient internal-combustion engines will form the basis of mobility for a long time to come – also for vehicles with hybrid drive.	Clean internal-combustion engines will form the basis of mobility in the future	Mitigation	Product development and innovation
	2013	AR/13	Furthermore, within the context of our sustainability management, we use other non-financial indicators such as the CO2 emissions of our vehicle fleet or the energy and water consumption of our production sites.	Sustainability management allows non-financial indicators like CO2 emissions, energy or water consumption of production sites.	Awareness	Identification
	2014	AR/14	Clean mobility. Daimler is on the “road to emission-free driving.” To this end, we have created an environmental roadmap that focuses on further efficiency enhancements to combustion engines, needs-based hybridization and locally emission-free electric vehicles with batteries or fuel cells.	Daimler is on its way to emission-free driving through more efficient engines, and locally emission-free electric vehicles with batteries or fuel cell.	Mitigation	Product development and innovation
	2016	AR/16	Our production related CO2 reporting follows the so-called Greenhouse Standard.	CO2 reporting with the use of the Greenhouse Standards.	Mitigation	legitimation

Figure 4 – Extract Codebook 1

B	C	D	E	F	G	H
Individual/Publisher	Year	Document	Meaning Unit	Para.	Category	Sub-Category
	2017	AR/17	As part of our Group-wide sustainability strategy, we set targets and define target indicators. Taken together, all of these targets form our comprehensive target program for the medium and long terms.	Sustainability strategy calls for targets and target indicators.	awareness	Identification
	2018	AR/18	Another important aspect is climate protection at our production plants. Mercedes-Benz Cars is setting the course for green production in Germany and Europe. Plans call for all manufacturing facilities in Germany to be supplied with CO2- neutral energy by 2022. The preparations for the exclusive use of green electricity for a climate friendly production in Europe are already well advanced.	Green production in Europe rather advanced through CO2 neutral energy by 2022.	Mitigation	production and energy generation
	2018	AR/18	Factory 56 will serve as a blueprint for all future vehicle assembly operations at Mercedes-Benz Cars worldwide. It obtains its energy from CO2-neutral sources that include a photovoltaic system installed on the roof.	Factory 56 represents the future of vehicle assembly operation worldwide with photovoltaic system installed for CO2 neutral energy source.	Mitigation	production and energy generation
	2020	AR/20	For us, the Paris Agreement represents more than just an obligation, as our commitment to its targets stems from our fundamental convictions. We therefore believe that it is our mission to develop technical innovations that will lead to CO2- neutral mobility around the world.	Paris Agreement is more than obligation, but from fundamental convictions which leads to the need to develop technical	Awareness	Perception

Figure 5 – Extract Codebook 2

B	C	D	E	F	G	H	I
Individual/P ublisher	Year	Document	Meaning Unit	Para.	Category	Sub-Category	Comment
Prof. Ernst Ulrich von Weizsäcker, researcher	2012	SR/12	An electric car is environmentally friendly only if the power comes from renewable sources		Awareness	Perception	Perception
	2017	SR/17	We are guided in all of our activities by our culture (...), and the climate accords reached in the Paris Agreement.	Activities are guided by the Paris Agreement.	Regulatory	Paris Agreement	Paris Agreement
	2017	SR/17	At the same time, strong customer demand for SUVs is leading to a shift of the structural mix towards mid-sized and large automobiles, which presents us with a significant challenge to meet the targets of the European Union in. We continue to work hard to meet all statutory CO2 requirements, including the very challenging EU limits for.	Stronger customer demand for SUVs makes it difficult to meet targets of the EU, undermining the fact that simply offering alternatives is not enough to meet targets, but also depend on customers' purchase decision	Regulatory	CO2 and fuel consumption standards	CO2 and fuel consumption standards
	2019	SR/19	This report also is about crucial changes. Its title "SpurWechsel", German for lane change, stands for kicking our transformation towards sustainable mobility into high gear. It is based on the conviction that "business as usual" is not an option in times of climate change.	Conviction that business as usual is not an option anymore in times of climate change.	Awareness	Perception	Responsibility

Figure 6 – Codebook

B	C	D	E	F	G	H	I	J
Individual/P ublisher	Year	Document	Meaning Unit	Para.	Category	Sub-Category	Comment	
	2021	SR/21	In order to achieve its long-term climate-protection goal of becoming CO2 neutral by 2039, Mercedes-Benz is planning the complete electrification of its product range.	The goal to become CO2 neutral by 2039 includes the plan to completely electrify ist product range.	Mitigation	Product development and innovation	electric mobility	
	2020	TCFD/20	In addition, climate-related risks and opportunities are integrated into the Group-wide risk management process at Daimler. Via the segments, information for reporting to the Board of Management and Supervisory Board is passed on to Group Risk Management.	Climate-related risks and opportunities are integrated into the Group wide risk management process.	Adaptation	risk management	risk management	
	2020	TCFD/20	Circumstances categorized as environmental issues include CO2 emissions, extreme weather events, waste prevention, and recycling.	Categorization of environmental issues in the risk management system include CO2 emissions and extreme weather events.	Awareness	Perception	Responsibility	
	2021	TCFD/21	Non-compliance with Regulations applicable in the various markets might result in significant penalties and reputational harm, and might even mean that vehicles with conventional drive systems could not or could no longer be registered in the relevant markets. The Mercedes-Benz Group counteracts these risks by with the transformation towards electric mobility and the associated realignment of its products.	Regulations contain a risk which can be counteracted by a transformation towards electric mobility and realignment of ist products.	Regulatory			

Figure 7- Codebok