

How can the lack of impactful change in the electrification of the German automotive industry be explained?

Bachelor Thesis – Public Governance Across Borders

03.07.2019

17.672 Words

Junes Koohestanian

S2027569

supervised by Dr. Ringo Ossewaarde

Co-corrected by Dr. Minna Van Gerven-Haanpaa

University of Twente, Enschede

TABLE OF CONTENTS

1. Introduction	5
<i>Research Question.....</i>	<i>8</i>
<i>How can the lack of impactful change in the electrification and decarbonization of the German automotive industry be explained?</i>	<i>8</i>
2. Theoretical framework.....	11
2.1 <i>Introduction of the Framework.....</i>	<i>11</i>
2.2 <i>Interest Groups: classical functions and strategies.....</i>	<i>11</i>
2.3 <i>Conceptualization of Strategies.....</i>	<i>13</i>
2.4 <i>General Challenges and Strategies of the German Automotive Industry.....</i>	<i>14</i>
2.5 <i>Historical Development of the German Automotive Sector.....</i>	<i>16</i>
2.5 <i>Concluding the Framework.....</i>	<i>18</i>
3. Methods.....	20
3.1 <i>Research Design.....</i>	<i>20</i>
3.2 <i>Case Selection and Sampling.....</i>	<i>21</i>
3.3 <i>Methods of Data Collection.....</i>	<i>22</i>
3.4 <i>Methods of Data Analysis</i>	<i>24</i>
3.5 <i>Conclusion of Methods.....</i>	<i>26</i>
4. Data Analysis.....	27
4.1 <i>Wait and See - The German Automotive Industry before the Dieselgate.....</i>	<i>27</i>
4.2 <i>Image campaign – or genuine interest</i>	<i>31</i>
4.3 <i>EU Policy Targeting Traffic and Transport.....</i>	<i>32</i>
4.4 <i>EU Traffic Policy after the Dieselgate.....</i>	<i>35</i>
4.5 <i>The Failure of Germany and its Industry</i>	<i>37</i>

4.6 Conclusion of the Analysis	43
5. Conclusion	44
5.1 the General Answer to the Research Question.....	44
5.2 Limitations of the Research	45
5.3 Implications for Policy and Governance.....	47
6. Literature.....	49

TABLE OF FIGURES

<i>Figure 1 CO2 target values for new cars (Acea.be, 2018).....</i>	<i>29</i>
<i>Figure 2 Historical average CO2 emission values, standards, and proposed targets for European passenger cars. Rates in g/km and per cent refer to annual rates („EU CO2 EMISSION STANDARDS FOR PASSENGER CARS AND LIGHT-COMMERCIAL VEHICLES", 2014).....</i>	<i>33</i>
<i>Figure 3 Historical super credit levels in EU passenger car CO2 standards (Wolfram, P., 2016: 1-18).....</i>	<i>34</i>
<i>Figure 4 Verband der Automobilindustrie – (VDA-Elektrobericht international, 2019).....</i>	<i>37</i>
<i>Figure 5 Volkswagen - Active Cylinder technology ("CO2 EMISSIONS FROM CARS: the facts", 2019).....</i>	<i>41</i>
<i>Figure 6 Share of the automotive industry in national Gross Value Added ("CO2 EMISSIONS FROM CARS: the facts", 2019)</i>	<i>42</i>

ABSTRACT

The electrification process poses a challenge to the German automotive industry as well as the state. During this thesis, the process of electrification of traffic, as well as the challenges, which this transition brings for the involved stakeholders, are presented. By qualitatively analysing the behaviour of the involved parties, the different strategies pursued during this technological transition are shown. The strategy of the German automotive industry is elaborated by thoroughly analysing secondary data in forms of position papers of the automotive industry. In order to parse the strategy of the EU and German policymakers, primary data in forms of policy papers is analysed. Those analyses show the state as well as the automotive sector being in a complicated situation regarding the electrification of traffic. The analysis shows that European policymakers had little innovative policy input as well as a non-cooperating automotive industry, concerning climate protection. Contrasted to Norway, little innovative policy approaches were made, which leads to the current low rates of electrification.

“Ich glaube an das Pferd. Das Automobil ist nur eine vorübergehende Erscheinung.” - I believe in the horse. The automobile is only a temporary phenomenon.

(Wilhelm II, last German emperor, 1859-1941)

1. INTRODUCTION

As the automotive industry - especially the German automotive industry - has been under heavy pressure regarding the call for innovation, many new challenges and questions start to arise for the sector. The emission scandal in Germany, starting 2013 with multiple companies deliberately spreading false information about the environmental impact they make, lead to a general distrust towards the whole sector. Resulting from this scandal, a call for 'cleaner' cars with fewer emissions and the request for transparent processes in the automotive sector went through society and politics; on national as well as international EU-level. The process of change in mobility is deeply interconnected with a need for change in multiple other sectors. Working for the automotive industry's policy department in Brussels, I personally realised, that especially the adjustment of environmental policy is vital in order to make the shift towards mobility with fewer emissions possible. Emissions can only be reduced if electric cars (with reduced emissions compared to the combustion engine) do not rely on coal-fired power station energy, as this would lead to a zero-balance in the outcome of emissions that ought to be reduced. This interconnection shows the importance of adequate policy throughout all sectors which have a relevant environmental impact.

In Germany, about 50.000 all-electric cars and plug-in hybrids were sold in the first three quarters of 2018. This amount of sales is 36% more than the sales for the same period of the previous year. However, growth in Germany is below average compared to the core countries of electrification, with Norway leading even in terms of sales volume (Bratzel, CAM, 2019). After Bratzel, core countries of the electrification of traffic around the globe, are for example, Germany, but above all, China as the main producer of battery cells. In the first three quarters of 2018, about 700.000 e-cars were sold in China, which is a growth from 2 to 3.5 percent in market share. On first glance, this seems to be a remarkable increase, but looking at Norway, with a total 46.7 % share of E-cars on the market it becomes apparent that there is a lot of room for improvement in Germany and the EU. So, what is it that Norway does differently or maybe even better? Electrification is only possible if the given framework allows a transition of a sector in a way which is not risking the competitiveness and therefore the existence of one of the most significant German industry sectors. Especially the clash of interests between policymakers throughout Europe and the industry is a focal point of this thesis. How can the

transition of a sector happen in a way that thousands of jobs, which are provided by the automotive sector in Germany, are not in danger? Lots of research has been done on the issue of electrification in Germany. This research mainly focuses on technical details as in adaption of engines or for example, keeping the supply chain sustainable throughout this process of transition. Is there a strategy which the automotive sector follows, that can be identified (Fournier et al., 2012)? Electrification is only possible if the given framework allows a transition of a sector in a way which is not risking the competitiveness and therefore the existence of one of the most significant German industry sectors. Especially the clash of interests between policymakers throughout Europe and the industry is a focal point of this thesis. How can the transition of a sector happen in a way that thousands of jobs, which are offered by the automotive sector in Germany, are not in question?

Since resources like oil are finite, and climate change moves into the focus of the public eye, it seems to be inevitable for German car manufacturers to switch to electric powered vehicles. This process of transition will be in the scope of this thesis. It is specifically vital to examine this process from the position of different actors. On the one hand, the strategies of the automotive industry, but also the goals and strategies of policymakers in this process will be portrayed and analysed. As the automotive sector is a traditional German industry sector, it has a unique position in German politics and is said to be favoured by specific political parties and actors. This position of a poster industry is to be questioned after the recent 'diesel scandal' which strained the sector's reputation just a few years ago. Under these circumstances, the debate on electrification gained whole new momentum. Throughout previous analysis of the electrification, the factors of the state-industry relationship remained steady. (Woyczehowski, 2014). As the state-industry relation is after the 'Diesel scandal' an agitated field of politics, this research is put into a new light, making it necessary and unparalleled compelling

Norway, a state that was able to electrify the mobility sector and therefore significantly lower emissions has emerged as the poster child of electrification. It will therefore serve as a benchmark for Germany, a state with seemingly little innovation regarding the electrification. This comparison will point out measures that have already been taken as well as show missed chances and remaining opportunities for Germany.

The current focus of research on electrification lays on exploring new technologies and methods to make the production and usage of lithium-ion batteries more efficient and sustainable. Besides that, the German automotive sector especially pursues further research on alternative fuels such as Methanol, Ethanol, Methane and Ammonia. Alternative fuels or E-fuels would keep existing production structures and methods in use. As the production of batteries is mainly taking place in Asia, using resources from mainly African countries, European automotive companies would have fewer financial gains of the expansion of electric automotive technology. This hints to the conflict between politics and economy regarding the electrification of traffic. This research will show to what extent a clash of interests exists between the stakeholders and compare this possible discord with a country with a seemingly none existing discord, Norway (Matthies et al., 2017).

Previous research which is related to this thesis mainly dealt with the influence of different interest groups on the environmental policy of the EU. Lelieveldt and Princen (2011) have done this by outlining methods and strategies of interest or lobby groups on the policy-making process of the EU. More fundamental research has been done earlier by Mazey and Richardson (1993) who analysed the interest groups in the polity EU in an early stage without putting specific focus on their influence on the policy-making process in the European Union. Later on, similar studies to this work, published by Coen and Richardson (2009) analysed more recent forms of lobbying and interest representation. Many studies analyse the scope and range of lobby groups throughout the EU, such as Berkhout and Lowery (2008). Putting the lobby groups into a comparative perspective, they analyse the diversity of lobby groups in order to compare those. Scholars who analyse the strategies of lobby groups, which is of particular relevance to this thesis are Coen (1997, 1998), Eising (2004) as well as Bernhagen and Mitchell (2009). A more recent scholar by Hix and Hoyland (2011) is of relevance to this thesis as it pinpoints the clash of public and private interest throughout EU-lobbying (Straßner, 2006).

As only “few attempts at evaluating interest group influence or power in the EU have been undertaken” (Beyers, Eising & Maloney 2010: p. 110) until now, this thesis seems to fill an unresearched gap. There is no comparable study which analyses the issue at hand under the focus on the strategies of the stakeholders involved. This thesis is similar to a study by Klüver from 2009, who contrasted the different lobby influences and positions throughout the policy-

making process of the EU while contrasting environmental and non-environmental objectives in a quantitative approach. Even though this thesis deals with a similar issue, the research approach, as well as the design, will be treated differently. This paper will analyse the strategies and positions of stakeholders qualitatively inside of one polity and contrast them to strategies outside of the European Union. As Norway is not involved in environmental policies made by the European Union, this gives a new point of view on the topic.

In order to prove the previously examined clash of interest, this thesis will analyse the topic after *specific sub-questions* which are listed and explained in the following section. This section will then be followed by the *description of relevant theories* which are applied in order to answer the research question. Those theories are mainly conceptualizing strategies as a theory in order to lead to the *analysis*, which is in later parts of this thesis. The theories are then followed to the explanation why this topic is outstanding and of specific public interest and therefore of *societal relevance*.

RESEARCH QUESTION

HOW CAN THE LACK OF IMPACTFUL CHANGE IN THE ELECTRIFICATION AND DECARBONIZATION OF THE GERMAN AUTOMOTIVE INDUSTRY BE EXPLAINED?

How is the automotive Industry adapting to the upheaval towards fully electric mobility?

Which strategies does the EU follow in order to keep the industry competitive in transnational competition but at the same time to act environmentally friendly?

Contrasting Germany to Norway as a pioneer of electrification, what could Germany do in order to reach a similar market share of electric vehicles similar to Norway?

At this point of the thesis, an in-depth analysis of the research to this point has been given. The following part will now further describe and explain the research questions. In order to define the object of research further, this thesis will show how the industry tries to deal with the challenging transformation by answering the question: *“How can the lack of impactful change in the electrification and decarbonization of the German automotive industry be explained.”*

This will put the focus of this research on the objectives and strategies the automotive industry follows, in order to work against the previously explained possible lack of electrification. To then focus further on the strategies which are followed by the policymakers in the EU, in the electrification process, the sub question *“Which strategies does the EU follow in order to keep the industry competitive in transnational competition but at the same time to act environmentally friendly?”* will put specific focus on laws and policies passed which target the electrification of traffic. The other central stakeholder besides the policymakers, in the process of electrification of traffic is the automotive industry. Thus, this thesis will analyse the strategies of the automotive industry in Germany during this process by answering the question: *“How is the automotive industry adapting to the upheaval towards fully electric mobility?”*. Finally, the answer of the sub question: *“Contrasting Germany to Norway as a pioneer of electrification, what could Germany do in order to reach a similar market share of electric vehicles similar to Norway?”* will then broaden the analysis on a different polity outside of the EU to enable a better comparison of strategies and their effectiveness.

The analysis of these research questions will be done by analysing strategies and goals, proposed by legislative bodies in order to reduce Co2 emissions. The state seems to be in an intricate situation which results from the conflict between EU environment policies and the attempt to keep the sector competitive. The questions target a specific scientific gap, as they aim at the qualitative analysis of stakeholders from different political assets and with different goals. The automotive industry has economic and market-driven strategies whereas the policymakers in Germany and the EU, responsible for environmental policy outcome in Germany, have balanced targets between economic strength of the state as well as ecological responsibilities. The last sub-question, which asks for a distinction and contrast of to a case which has different assets and therefore different outcomes will point out those differences and open up space to highlight the mistakes which have been made in German and EU environmental and traffic policy. Norway seems to have found a successful way of electrifying traffic throughout its country. In order to understand supposed mistakes that are made in Germany, dealing with electrification, a part of this research will compare the German approach to this challenge with the Norwegian approach. Therefore, these questions open up the response filling a definite scientific gap (Lamprecht, 2018).

These questions will initiate qualitative research, as they are asking for specific strategies and settings of a defined group of stakeholders. They are especially trying to give reasons for the development of the electrification in Germany. These questions also initiate an open research approach, which does not require a too sizeable theoretical basis in order to follow the structure of the research. The knowledge is gained in the Analysis section and will then be theoretically substantiated in order to be able to provide plausible explanations to the question at hand (Bratzel, 2018).

Research on this topic is especially now of high societal relevance. The people are polarized by the topic as they feel personally affected by the outcome of the challenge of electrification. A lot of rather traditional minded people demonstrate against traffic bans on one hand, whereas many people support measures taken by cities throughout Germany in order to reduce traffic in city centres. As the industry tries to keep sales of combustion engine powered-cars high due to higher margins, they support research that invalidates the claims of dangerous diesel vehicle emissions.

On the other hand, policymakers keep ruling further restrictive measures against combustion engines and towards electrification as they try to reduce health-risking levels of Co₂ and NO_x in German cities. Besides that, the German automotive industry is specifically invested in the production of combustion engines. How will the big firms like Mahle or ZF survive this change, without having to dismiss thousands of workers?

2. THEORETICAL FRAMEWORK

2.1 INTRODUCTION OF THE FRAMEWORK

In order to answer the research questions, this section of the thesis will present theoretical findings which are relevant in order to answer the research question later on. Those theories try to give a detailed understanding of the topic and the background to it. In order to being able to understand the issue, it is necessary to understand the history and development of the German automotive industry. By theorizing the developments of the sector as well as its relation to policy-making organs, the intricacy of the issue becomes more distinct. Furthermore, interest groups and lobbying organisations will be analysed. In order to do so, classical strategies and functions will be delineated in this section. As the main focus of this thesis lays on the strategies which are created and possibly followed by the stakeholders at hand, this section will also theorize and conceptualize strategies as a concept, at first in general but in further explanations in politics and economy as well.

2.2 INTEREST GROUPS: CLASSICAL FUNCTIONS AND STRATEGIES

In order to give a better understanding for the work of interest groups, the following section will present and explain how interest groups act and why they act the way they are acting. This will help to understand the analysis of the strategies of the German automotive industry better. Therefore, different scholars are used which deal with the behaviour of interest groups, especially in lobby and other policy-influencing activities.

Interest groups are known as the central parts of a democratic decision-making process. Their task is the formulation, processing and articulation of issues and interests in democratic systems (Mai, 2006: 268 – 274). They are broadly seen as a significant part of the legitimisation of democratic systems (Langer, 2008: 87ff). These Interest Groups, on the other hand, achieve their legitimisation through their members. As different experts of a field gather in an organisation, they are often supplying politics with broader and expert knowledge, giving policymakers the input needed in order to govern and implement laws in a reasonable way.

Therefore, interest groups can be seen as institutions acting and mediating between society, economy and policymakers (Lösche, 2007: 14f.).

Those functions of interest groups can generally be executed in two ways. They can either approach policymakers directly or use their members as a tool to voice their interests in order to access and possibly influence policy makers (Schmedes, 2008: 34). As this can take place on all levels of the multi-level systems of the EU, it seems to be very hard to track any of those activities (Schmedes, 2008: 37). Literature dealing with strategies of lobby groups and interest representations comes up with three different approaches of lobbying which are responsible for shaping the group's strategy. As the organisation acts in their specific political interest, they follow this logic of influence in order to achieve the aspired policy outcome (Beyers, 2008, p: 1192; Michalowitz, 2007; Schmitter & Streeck, 1999, p. 19). Besides attempting to achieve specific policy outcomes, lobby groups follow the strategy of surviving. This strategy consists of the generation and management of resources and staff in order to keep the organisation going. Therefore, strategies of lobby groups are always future-oriented regarding their work (Berkhout, 2013, p.220-250). Lastly, the behaviour and strategy of lobby groups are formed and modified by the setting and the context. This behaviour means that different polities are leading to different policy outcomes (Baumgartner, Berry, Hojnacki, Leech, & Kimball, 2009, p.7-42). Especially interest groups which are closely connected to economic sectors seem to influence policymaking processes to a more considerable extent. More interest groups lead to more access to specialist knowledge to policymakers. In turn, this does also lead to more groups influencing policymakers. This higher competition of interest groups then leads to more information going to policymakers. A problem in the democratic legitimisation of policymakers is to be recognised whenever interest groups do not have equal access to policymakers (Michalowitz, 2007).

In the early 1960s, interest groups were becoming relevant in western democratic systems for the first time, when associations started to rise (Leif, 2003: 24–36). The role of groups, representing specific interests started to be seen controversially in the later 1970s, when their work started to be more complex and less transparent (Willems & Winter, 2007: 13–50). This distrust seemed to settle over the years, leading to a multi-level and multifunctional landscape of interest representations which have settled into an essential role of advising and informing

policymakers. Interest groups are essential in order to guarantee pluralism in democratic systems (Berkhout, 2013), as they bundle interests of the society while giving citizens the possibility of engaging in political processes and therefore form the society, differently than, e.g. parties do. Straßner provides a pluralism theory which sees in a diverse scope of interest groups a sign of a sovereign society: "Finally, for a deliberative and associative theory of democracy, the associations advanced to areas of the purification of interests, the formation of democratic value attitudes, and places of democratic self-government" (Straßner, 2006: 345-368). Like all kind of groups, parties but also political organs have to make decisions in the decision-making process of democracies. They are all following strategies in order to reach their aspired goals. In order to be able to analyse the strategies of the automotive industry but also of European policymakers regarding the electrification of traffic and therefore the decarbonization of the environment, one has to analyse the concept of strategies (Langer, 2008).

2.3 CONCEPTUALIZATION OF STRATEGIES

In contemplation of what the strategies of the Stakeholders involved in the topic are, it is crucial to gain an understanding of what strategies are, where the concept was first used and how it is applied nowadays. This initiates the later application of the analysis of the stakeholder's strategies.

'Strategy' is a concept which is often used within political bodies but also economical organisations. After Seufert et al. (2006: 59), strategies are necessary and are becoming more and more critical in order for political and economic organisations to compete. Strategies are often used as a tool in order to understand and manage complex problems (Langer 2008: 230-239). A strategy is the contextual orientation of a person or a group regarding a specific topic. This orientation does often also include the strategy which is supposed to lead to the solution of the topic. In order to come up with a strategy, there has to be sufficient knowledge of the topic and of the aspired result as well as a methodological policy in order to reach this goal. Historically, the word strategy originates from the ancient Greek, describing the military action of leading a troop (Wahrig, 1985: 421). It was used for the first time in the year 357 BC by the ancient Trojan hero Aeneas, as the word "strategos ". The word did soon after that develop to

an expression used in terms of strategic thinking, such as in military but also politics (Wiesendahl, 2010: 21-44).

Summing up, strategies are and have ever been used in order to simplify and rationalise complex processes, leading to the control and giving the future path of the organisation in order to master whichever challenge is at hand.

2.4 GENERAL CHALLENGES AND STRATEGIES OF THE GERMAN AUTOMOTIVE INDUSTRY

After the general conceptualization of the concept of strategy has taken place, it is possible to already work out general strategical behaviour of the German automotive industry. This section is needed in order to give a basic conception of the behaviour of the automotive industry and its general approach to dealing with challenges and what challenges are at stake.

The German automotive industry had to apply different strategies for some decades in order to survive in the competition of automotive industries but also in order to follow and influence regulations of any kind given by policymakers. Especially the process of electrification of the automotive sector seems to lead to significant changes in industrial supply chain procedures. Those changes are done after specific strategies which will be analysed and interpreted in further parts of this thesis. Following the research of Fournier et al. (2012: 405-423) on the development of the automotive industry in Germany, the sector is exceptionally well known for the close connection of production sites and research centres. Regarding the many technological shifts ahead, Fournier et al. hint to a challenging decade ahead for the automotive sector. The literature describes the shift that comes through electrification as the core challenge of the sector. This challenge consists partly of a significant change in the value and production chain. As globalisation makes further progress, the global market for the automotive industry will grow. Though, after Fournier et al., it is not the same profit seekers as it used to be for decades: European states, USA and Japan. A significant shift in the global market share has been made to lots of different countries, above all China. China is right now leading in the production of battery cells worldwide, forging electrification forward. This development will force the European and German Automotive industry also to start building

up new polycentric production networks. The theory shows especially that there is nowadays a difference between "Automobile production in Germany" and the "German automotive industry" as the usage of the terminology starts to differentiate more and more. One of the focal challenges within this shift within the sector is, after Fournier et al., trying to stay competitive with China, being the driving force in exporting Electric vehicles and battery cells. This challenge is especially relevant for smaller and middle classed cars, as the production of the high class seems to be untouched by international automotive industries.

Besides the high-class cars, especially in smaller production companies, many segments for the German industry diminish drastically during the process of electrification. As mainly the industry producing parts for cars is under high pressure of the Outsourcing of industrial services, it remains a challenge within industrial policy making in Germany and Europe, likewise (Fournier et al., 2012: 405-423). In conjunction to the technical challenges which Fournier et al. focused on, there are plenty of challenging factors that go hand in hand with the need for innovation regarding electrification. Proff et al. examined the extent of pressure that comes through policymakers, putting forward new directives which the industry must fulfil. This pressuring can occur on different levels, national or trans/international.

After Woyczehowski (2014: 49-57), traffic in Germany is responsible for about 15% of CO2 emissions. Therefore, it is one of the first sectors to be approached when producing fewer emissions. German policymakers set the goal of one Million EV in Germany until next year. This objective is still far from being reached. The focus in the German automotive industry has in the past years been set on research and innovation. Many projects that research on better and more efficient EVs have been founded throughout the last decades and are still running. The amount of EV and plug-in hybrids has risen, though it still seems to be too little. In the first place, policymakers who are tackling this issue have to make sure that the demand for Electric vehicles will rise. Blöcker (2015) stated in his research on the challenges for the automotive industry that there are still too little incentives in order to make the ownership of an electric vehicle less unattractive and inconvenient. Incentives can be bonuses given by the state but notably better conditions of usage. Blöcker examines the infrastructure for EVs still not being sufficiently widespread in order to make the electric vehicle convenient for many citizens in Germany (Blöcker, 2015: 534-541). The German Automotive industry, being within the most

significant and most important industry sectors, is said to have a significant influence on the decision-making process in Germany and the EU which revolve around the sector. Lamprecht (2018: 7-21) describes in his recent work how the history of the sector in Germany influences current decision-making processes in Germany but also throughout Europe. The German automotive industry produced about 6 Million Cars in 2015 alone. This amount leads Lamprecht to the assumption that the German BPI is highly influenced by the automotive industry, which leads to a partly dependent state of the sector. Not only does the sector cause a rise in income for the state, but it also provides about 800.000 jobs, which makes it the largest employing sector in Germany (Hüttenrauch, 2007: 17-25). As the economy is also highly dependent on the states' regulation, this does inevitably lead to a two-sided dependency between the states and the economic sector.

In conclusion, this chapter enlightens on current challenges of the automotive industry and how different research which has been conducted is aware of these challenges. Also, it gave a slight overview on how the automotive industry aims to deal with these challenges.

2.5 HISTORICAL DEVELOPMENT OF THE GERMAN AUTOMOTIVE SECTOR

In order to understand why the German automotive industry has a special position in German economy-politics connections, it is necessary to understand the development of the sector throughout the past centuries. As it is obvious that the sector has a special affiliation with politics in Germany, this affiliation needs explanation. This thesis theorizes this unique connection, as it pertains the two central stakeholders which this paper deals with. In order to be able to analyse the strategies and their affiliation, a basic understanding of the automotive sector and its development is required.

The automotive industry had had a good reputation since its early years, back in the 19th century, when Carl Benz produced the first vehicle with an internal combustion engine. Centuries after this technological revolution has taken place, the industry seemed to have its beginning as the first big car companies were founded: Volkswagen (VW), Bayerische Motorenwerke (BMW) and Daimler. Soon after that, other suppliers and manufacturer companies were founded and helped the German state to create a boom within the whole

economic sector. Since then, German cars and parts were known as high-tech and high-quality products, which also reflected on the sales the industry made in the following centuries worldwide. This history leads to a close exchange of the sector with the state and politics. As decarbonization has not been a significant topic just until a few years ago, most of the German political parties were highly supportive, regarding policies striking the sector. Lamprecht (2018:19-25) examines that the industry always has high interests in high sales, high export rates, leading to high productivity, which forcefully leads to a higher employment rate in Germany. This way, Lamprecht explains his theory of why the automotive industry always kept a reasonable relationship to German conservative and socialist parties. Wallentowitz et al. (2009: 29-38) theorise the automotive industry and its attempts to enhance the trust and the relationship inside the economic sector but also towards political institutions and policymakers. In order to intensify this relation of the sector to the state, in 1901, the association of the German automotive industry (Verband der Automobilindustrie – VDA) was founded. The goal of the association was and still is the representation of the manufacturers of automotive parts, for example, Bosch, as well as the representation of the producers. At the same time, the VDA is organising and running the IAA, the international automobile fair in order to give the companies the possibility to represent and promote the innovations of the industry. The VDA is currently lobbying for over 600-member corporations, mainly on Germany politics in Berlin as well as EU policies that are decided in Brussels (Wallentowitz et al., 2009: 29-38).

In September 2018, Volkswagen confirmed a manipulation in their diesel combustion engines towards the US-American environmental agency. This manipulation did soon after September broaden to a scandal which involved large parts of the industry and did soon after the revealing lead to a nationwide discussion, which gave the German automotive industry a large image-issue throughout society as well as in politics. Bratzel broached the issue of lost trust and relations that were built up over the years by the industry towards the society, as well as the politics, was lost within few weeks, in his research on the topic, examined for the German consumer advice centre. The scandal was at its core about test data differing massively from real life emissions, as specific measures have purposely been taken in order to make the cars seem to be "greener" (Bratzel, 2019). Conrad et al. (2018) theorised this scandal and its effect on the sector in 2018. Their research shows the clarification of these falsifications being slow and very intransparent, with new parts of the scandal being revealed only after some time,

making the industry lose nearly all of its standing. As stated by Kalbfell (2004), the German automotive industry is reliant of the trust they receive by customers, the state but also other firms within the sector. Trust always to play a significant role in the success of the automotive industry (Lamprecht, 2018).

Looking back at the history of the industry, this high level of trust is undoubtedly based on the reputation which the industry withheld. Merging this theory with Conrad et al. (2018) describes why the scandal is a primary incision in the successful history of the automotive sector in Germany. According to Conrad et al., this loss of trust throughout the sector does and will lead to stricter policies, beginning with more strict emission-measurement techniques that are enforced by the EU-parliament. As more and more Lobbyists of the sector have lost its influence on the decision-making process of automotive related topics, lots of policies urging towards electrification and decarbonization are discussed at the moment, putting the industry under pressure (Conrad, 2018: Quelle). This recent scandal makes this thesis especially interesting, as it created a new scientific gap that has hardly been researched on.

Following this development of the automotive industry gives a better understanding of why the current electrification challenge is of particular relevance. It seems like the electrification process as well as the manipulation scandal have ushered in a new era for the German automotive industry.

2.5 CONCLUDING THE FRAMEWORK

The German automotive industry is a very ambivalent field to research on. As an industry that was always used in order to showcase the success of German mechanics and technique, it started to develop an image of polluters and abusers of the environment. What used to be described as a state-economy collaboration is now one of the most controversially discussed economic sectors in Germany. The state, trying to fulfil its duties regarding environmental directives working in a large amount towards electrification, while the automotive sector tries to stay competitive against more affordable cars being imported from Asia. This analysis will be a vital part of the forthcoming bachelor thesis. Most notably a comparison to Norway will show, in which ways German policymakers could have worked more efficiently towards

electrification. After putting together relevant theory which will in further parts of the analysis be of use, the following section will examine and explain how this analysis is built up and designed and what is to be represented by it. The selection of cases as well as the design of the research has been chosen to be in a specific way in order to carry out the analysis as precisely but at the same time agilely as possible. Formally concluding, this thesis is expected to give insight on the behaviour of the central stakeholders in the process of electrification in Europe. (Wiesendahl, 2010) It is expected to have both stakeholders work towards a further electrification, though driven by different motives. As the automotive industry is acting rather market and profit driven, the strategy is expected to be aiming on high monetary output while proceeding with electrification of traffic. As policymakers are rather environmentally driven, they are expected to act rather out of political progress and climate action. Though it is not to forget how influential the automotive sector is, regarding GDP and the donated jobs which are linked to the automotive industries success. Following the previous parts of the thesis, at this point the variables are clear to be labelled. The independent variable is therefore the strategies, as in goals, measures taken but also framework conditions. Therefore, dependent on those strategies is the level of electrification, which is measurable from the electrification rate (Kronforst, 2019).

3. METHODS

As this thesis requires many different qualitative data, specific methods of data collection will be used to achieve a comprehensive understanding of the strategies of the stakeholders involved in the electrification of traffic in Germany. This qualitative research will give a better understanding of the networks and interdependencies. Therefore, this part of the research presents the data, as well as the methods used in order to analyse the data. This will lead to a better understanding of the analysis and therefore generate a precise understanding of the topic.

3.1 RESEARCH DESIGN

In order to answer the research question and the sub-questions, this thesis will not follow a classical single case approach, but rather explicit qualitative research of the strategies and facets that constitute the electrification and decarbonization process in Germany. The analysis will take part in a mixed methods approach, combining secondary sources, in order to analyse the automotive industries strategies as well as primary sources in order to then work out the strategy which the state follows and followed during the past decade. Secondly, a comparative case study will be made with the example of electrification in Norway. In order to do so, further secondary data will be used, compared and contrasted to the previous findings. This design is appropriate in the quest of answering the research question since it investigates the situation in Germany, more specifically the German automotive industry, at first via a classical qualitative approach. After, in order to contrast the development of Germany with the development of Norway, the previously won knowledge will be used in order to then contrast it to the development that has taken place in Norway. The research questions do initiate research of qualitative kind well. To control the observations made and to put them into perspective, the contrastive approach offers further details on the strategies employed in a country where a lack of electrification is not discernible.

Nevertheless, in order to explain the lack of impactful change in the electrification of the German automotive industry, a deductive-diagnostic research design is used. Based on Geels (2002) dealing with multi-level perspectives, like the thesis requires many different data

sources of qualitative kind in order to being able to work out strategies of the different stakeholders. Theory that proves to apply to the German automotive industry, the conflict between the automotive industry and policymakers is analysed. In light of the theory, a qualitative comparison of a dataset on values of the highly electrified country Norway and the data of Germany is made. The data will be used to initiate the analysis; therefore, the analysis will be based on the data of the dataset while analysing the strategies that lead to those electrification rates (CAM, 2019).

During the analysis of the strategies in the electrification-process of the state, as well as of the industry, the research will be explanatory, as this thesis is researching relationships between the lack of electrification and the strategies of the actors. The research question of the thesis does also suggest exploratory components, as this paper is not only relating to reasons of lacking electrification which is already given in the literature and existing research, but this thesis will also research any other reasons that might lead to a lack of innovative process in the electrification of German traffic.

3.2 CASE SELECTION AND SAMPLING

The German automotive industry is one of the most controversially discussed sectors of industry in Germany at the moment. As a highly influential sector, with a long history, it seemed to be interesting to research on. After getting in-depth insights into the industry, working for the European policy department in Brussels, I got even more interested in researching the sector. Electrification is one of the many hot topics that the automotive industry has to deal with, as it leads to a significant transition in the sector, forcing many big enterprises like Mahle or ZF to move away from the production of pistons, as electric engines are not using pistons anymore. This means that some of the biggest German Companies need to invest in innovative technology in order to stay competitive in the future. With the background of the diesel scandal, the automotive industry was even more exciting to research, as this led to a whole new setup of the industry. Investigating reasons for the lack of innovation led this thesis to the necessity of including policies that are trying to drive towards innovation into this research. Therefore, I concluded to research the different strategical approaches on electrification from the economical (VDA) point of view as well as the political point of view.

As this seemed to be a well comparable selection of cases, one needed a broader frame to then compare the two strategies, making up one national trend, to a trend that seems to be different to the one in Germany. Hence, this thesis researched European states that are more developed in terms of electrification in traffic. Norway, a country which is on a comparable level of innovation as Germany but has at the same time a much higher rate of electrified traffic, was, therefore, the selected case. The trend in Germany is among other things highly determined by the strategies of the sector and the German policymakers. Comparing this trend with the trend in Norway will lead to even more profound insight and a more detailed analysis of the electrification in Germany. This comparison will be of outstanding significance as no other scholar deals with national strategies or at least strategies from one system to then contrast them to a case outside of this polity. This contrasting will make sure to work out the policies that are and were compelling enough in order to raise the level of electrification. Already now, one can see that the Norwegian trend seems to be composed of different aspects. On the one hand, the electrification of traffic seems to be highly influenced by the progressivity of transport policy, which is the focal part of the comparison between the two cases at hand. Differing approaches to transport policy seems to be the most significant difference between the two cases.

3.3 METHODS OF DATA COLLECTION

The data necessary for this research will be conducted by different methods as well. Firstly, and mainly, this paper will rely on previous research that has been done on the issue. By thoroughly investigating publications and documents of the automotive sector, as well as public documents describing the strategy of the state, one can obtain a significant part of the data. The analysed data will therefore be mainly primary sources as well as secondary sources which will be analysed in an in-depth document analysis. Based on the theory delineated earlier, this thesis tries to fill a scientific gap and therefore create new theory. Data used for the analysis of the stakeholder's strategies will be obtained by the timeline approach in order to give a chronological strategy development analysis. For the comparative part of this research, datasets from the VDA will be used, which are presented in a monthly report on electrification. This data is obtained in every European state by the statistics department of the association. Furthermore, in order to analyse the policymaker's strategies

in the European Union, international agreements and conference protocols will be analysed as well as the EU commission's proposals which are targeting traffic and environmental issues relevant for the automotive electrification process and therefore relevant in order to answer the research questions. This thesis followed the case-wise sampling approach, as presented by Flick (2007). Therefore, the analysis as well as the collection of data have taken place at the same time. The benefit of collecting data while analysing at the same time, is that the data collection is driven by previous findings and therefore one is able to collect and analyse more profound and targeted. When critical or interesting analysis have been made, further research in the same area has been performed in order to be as precise as possible.

By using data from different sources, the data is expected to be of high validity as they are the latest and most precise data on the topic existing. A threat to this study can be the many influencing parties, promoting on the issue. As it is an issue of high interest for lobby groups of all kinds, it is necessary to validate data before using it. The risk of covering the issue rather from one side than from another is mitigated as the references used throughout the research are too many and too precise in order to give space for false claims or results. Hence, it is possible that different studies on the topic find different results, which might be due to different methods, data or theory.

This analysis seems to be an appropriate measure of comparing levels of electrification throughout multiple nations, as the sources of data used in the research is from the VDA or the Center of Automotive Management, a highly recognised, independent scientific institute for empirical automotive and mobility research. By only using data from reliable sources, one can ensure appropriate and validity of the data. The data fits very well with the research question as the question and sub-questions ask for a broad scope of reasons for the lack of electrification. In order to give these reasons, primary data is used in forms of EU commission proposal in order to state the legislative aspirations of the EU as well as secondary data in forms of position paper and research done by automotive-related lobby groups. This secondary data will be used in order to analyse the strategy of the economic side of the issue. Thus, the data used does fit well in order to answer the research questions of this thesis.

3.4 METHODS OF DATA ANALYSIS

As explained previously, it is necessary for the purpose of more in-depth results to collect data while analysing it at the same time. This will lead to more flexibility in the research process and therefore to more specific answers to the sub-questions of the research. The analysis takes part in a storyline scheme, which will lead to exact answers of the research questions. As the questions are posed in order to be answered that way, this is self-evident that the analysis takes place in the same style. The sub questions lead from one to another. The first type of data analysed is policy documents and other legal papers. Those will give deep insights in the strategy and actions of the EU regarding electrification of traffic over a period of time. The second type of data, secondary sources is giving insights into the position and strategy of the automotive industry. Those position papers are already a firm description of strategies. By analysing multiple position papers of different actors who are part of the automotive industry, a rather specific picture of the automotive industries strategy can be templated. The categorization of data is therefore followed by the connection of data. As there are a broad span of documents available which are related to the topic, a prioritization of documents has taken place. This was done by crosschecking the data with each other in order to have arguments and events covering one another. This connection of data was done, until a comprehensive understanding of the strategy was existing. Hence the strategies of different actors within the automotive industry was often differing, this thesis focuses on the strategies of the automotive industry as one, depicted by their associations and representative organs.

Contentual, the research focuses on the German automotive industry as a central unit of analysis. To obtain insights on how the previously mentioned lack of impactful change in the electrification and decarbonization can be explained, the strategy of the automotive industry, as well as the strategy of state actors, deserves further investigation. In a comparative approach, equally promising to be a counterexample for the electrification process, Norway as a sub-case shall be analysed. In order to operationalise the strategies and electrification processes in the two countries, existing datasets and tables of the German automotive industry provide for multiple indicators of cross-national data on the development and current situation regarding decarbonization and electrification. The central concept of this research deals with the subject of electrification. Electrification as a concept of traffic describes processes which

were previously powered by non-electric engines, for example, combustion engines, and are throughout the process powered by electricity (Tschöke, H., 2015).

This process of electrification is not measurable, as there is no such thing as a high electrification score. Though there are specific indicators which make the level of electrification comparable, for example in order to compare states with one another. As it is very hard to operationalize the results finally, variables were set in order to still make the results comparable. The independent variable is therefore the strategies of the stakeholders involved in the issue. Hence, the dependent variable is the rate of electrification, which results in the end from the independent variable. Thus, to some extent of the analysis, the findings for the independent variable were explained with the level of the dependent variable.

One of these indicators can, for example, be the percentage of electrically powered vehicles that are within a country. For the use of this research, this thesis will operationalise this concept by comparing the different market shares of electric vehicles in the countries at hand. This operationalisation will be done by analysing statistics of the market shares of electric vehicles throughout Europe. By relying on this data, one can compare the levels of electrification with one another. As fully electrified traffic is nearly unthinkable at the moment, a ranking must be made in order to make the states comparable to each other (Tschöke, 2015: 38-58).

Throughout the analysis, the strategies of the different stakeholders will be analysed. As explained in the theoretical section of this thesis, strategies are oft, not tangible. Therefore, the result of this research will not leave this research with the comparison, but with the interpretation of findings in forms of strategies. Besides that, the theoretical part deals with strategies and logic of lobby and policy groups specifically. Those three different logics will, later on, be recognised in the strategies of the automotive lobby groups and give a more in-depth insight into their different approaches of lobbying. Those insights will help with analysing the outcome, which is the main topic of this thesis, the lack of impactful change in the electrification process.

3.5 CONCLUSION OF METHODS

This section showed how the theoretical part of this thesis is a fundament of the research. Even though the conceptualisation is limited to concepts which need much interpretation, this section explains to what extent the theories are necessary. Also, it shows how the theory will be used as a tool in order to analyse the data at hand. During this thesis, different types and forms of key research activities have been performed. Different concepts have been used, and previously defined, like the conceptualization of strategies as well as incrementalism in the EU. In order to achieve an in-depth analysis, different methods of data collection as well as data analysis have been used, such as the parallel collection and analysis of data. Those were used in order to create better understandings of the topic. Previous research of different kinds has been analysed and synthesised in order to create new insights to the topic.

4. DATA ANALYSIS

In order to make the data, analysed throughout this analysis comparable, the selection of data is especially careful executed. The data for strategies of the industry as well as of policymakers cannot be analysed in the same approach as the comparative research that will be done in the second part of the analysis, comparing statistics of Norway and Germany. In this case, two critical cases will be compared with each other in a comparative case study design. For the analysis of the actors of the electrification process in Germany, a precise analysis of research and literature is needed as strategies are hardly ever formulated in comparable units. Therefore, the analysis will be of specific relevance.

4.1 WAIT AND SEE - THE GERMAN AUTOMOTIVE INDUSTRY BEFORE THE DIESELGATE

The following section deals with the strategic behaviour of the German automotive industry. A specific focus is put on the period before 2018, when the reputation of the automotive sector in Germany was not encumbered with being seen as dishonest. It is of special significance to point out the strategy during this period, as the strategy of the sector was a lot different than it was later on. Though it seems like especially this period was jointly among other responsible for the slow electrification process of traffic in Germany.

The sector of the German automotive industry seems to have a particular view on environmental topics which are related to the sector. As further directives of the EU seem to limit the sector more and more regarding specifications of fuel consumption and emissions, the sector seems to relativise facts. This relativation, by environmental groups also called 'fact mongering' is primarily used when new EU-policies are in the policy pipeline of the European Union. It is primarily the lobby groups of the sector who put facts in a specific light in order to influence policymakers, especially those of the European Parliament. Members of the European Parliament are deciding about policies that are voted on but can also pose amendments in order to change the commissions policy-proposal. Especially the CO2 regulation for passenger cars has been a topic which was of high interest for both sides, the economic as well as the policymakers (EU-COM) and the decisionmakers (Council of the EU,

EU-Parliament). Therefore, this file seems like a representative file in order to analyse different strategies of all involved parties. The file seems to be of high relevance as all parties have an equally high interest in the topic. The industry fears harsh limitations regarding CO2 limits and therefore, high cuts in profit. For decision makers of the European Parliament, a topic like CO2 reduction is of particular interest, as it has a high external impact. In order to get possibly re-elected, voting behaviour and statements made regarding the possible limitations of automobiles are under the scrutiny of citizens.

The arguments of the industry seem to be counterproductive regarding a transition in the automotive sector towards a higher rate of electrification and therefore, fewer emissions. The main arguments of the sector are that the current rate of CO2 emissions is already low, compared to the rest of the world and is decreasing more and more. This decrease seems to be mainly due to power generation getting a cleaner (Grimm et al., 2016: 465-498). Besides that, the proposal for post-2020 CO2 targets for cars and vans of the European Commission suggest the industry is becoming more efficient, and emissions trading is beginning to take effect. Only transport is so far not doing a lot better in terms of climate policy. In the Paris Agreement on Climate Protection, the EU-states declared to reach, by around 2050, CO2 emissions from power plants, industry and cars practically being zero (United Nations, 2015). While those numbers seem to alert, the industry's strategies focus mainly on the process that has already been made, often comparing EU standards to the much worse developments Asian countries are going through, regarding emissions (Odyssey Database, 2015).

While China grew its emissions by 262 per cent between 1990 and 2012, the EU reduced its emissions by 14 per cent. A further development, disregarding ecological agreements, will lead to an even more significant difference between the two industrial production locations. A big part of the strategy of the automotive industry in Europe is the observation of the Chinese industry. As the European automotive sector has ever been the most influential producer in the branch, a loss of this pole position seems like a dramatic cut in the history of the sector (Quadrelli & Peterson, 2007: 5938-5952). Therefore, a big focus of the different lobbyists of the sector is the comparison with the Chinese industry. In 2014 the Institute of the German economy published a study in which facts and claims towards policymakers regarding CO2 directives, were presented. The study focusses on precisely this comparison of the European

industry and the Chinese producers. After the IdW (Institut der Deutschen Wirtschaft), in 2014, total European car traffic emitted just under 480 million tons of CO₂. The trend is downward.

On the other hand, the institute compared this positive trend with China, where it takes three weeks until 480 million tons of CO₂ are emitted through the use of fossil fuels. This tendency is sharply rising. As individual mobility in forms of automobiles is becoming more and more relevant in Asia, emissions from Chinese road traffic have increased by 818 per cent to 569 million tons of CO₂ between the years 1990 and 2014. One of the strategies that can be worked out through a comparison like this is the relativisation of own mistakes by pointing out even worse developments of competitive markets. This strategy is also recognisable in the discussion of emission values for passenger vehicles but also heavy-duty vehicles. The VDA published a statement in 2017, showing how much lower EU values already are, compared to the US or Asia. The EU emission limit for 2021 is the strictest in the world. The now decided values for 2025 are more than 50% below the thresholds in the United States (ACEA, 2018).

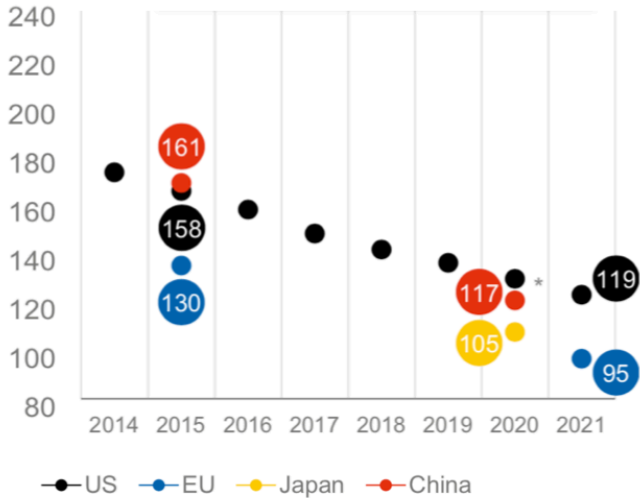


FIGURE 1 CO₂ TARGET VALUES FOR NEW CARS (ACEA.BE, 2018)

Throughout the discussion of CO₂ reduction within the automotive sector in the EU, representatives of European Automotive industries persist on the process which they have already gone through compared to China or the US. European emission limits are and have been for some years the strictest of all CO₂ limits worldwide (McKinsey, 2018).

In order to reach the targets described, technological advancement is chosen by the industry in order to reach given thresholds of CO₂ reduction, mainly given by the European Union's policymakers. At the same time, the automotive industry seems to hold on to the diesel combustion engine as long as possible, as significant parts of the industry are not ready for a complete transition towards electrification. Even though the industry tries to commit towards electrification and CO₂ reduction by producing more efficient vehicles, a prediction of electrification rates throughout Europe cannot be made precisely. This inability is due to changing strategies of the sector, also influenced by significant events like the "Diesel gate" described earlier in this thesis. Besides that, electrification rates remain hard to predict as oil prices and battery prices are not remaining stable (Borgeest, 2017: 7-12).

The German automotive industry started into the electrification process slowly and struggling. As the strategy was never to act fully ecological motivated but to make as much profit as possible, for a long time the automotive industry struggled and to some parts still struggle with the "chicken-egg-dilemma". The dilemma is about the industry waiting for the state to build in place the extensive infrastructure necessary for electrification throughout the continent, whereas infrastructure providers such as the EU or the member states do not want to risk too much by spending too much on infrastructure at the moment if the demand is not there yet. This dilemma leads to uncertainty, especially throughout the consumers, which does, therefore, lead to inhibited purchasing behaviour. Other reasons for the automotive industry not fully concentrate on the production of electric vehicles, for now, is the high price of the battery production and therefore the higher price of the vehicles, leading again to hampered buying behaviour. The service life of the batteries is also still a problem due to frequent short charging cycles or rapid charging processes.

The findings made in this sector are giving a comprehensive understanding of the methods and strategies of the German automotive industry regarding the adaption towards fully electric mobility. Comparing it with hypothetical expectations from chapter two, one realized that there are more efforts being made, towards further electrification, than expected. Still the reasons for not acting faster and more efficient were unclear. This section gives insights about how the automotive sector in Germany acts and why they are acting in that way.

As more and more manufacturers from overseas, such as Tesla succeed by selling electric vehicles on the European market, the "wait-and-see" strategy of European manufacturers started to drop. When Tesla started to sell Electric Roadsters in Europe in Mid-2006, a shift went throughout the European manufacturing industry as it was the first time that electric vehicles were sold in bulk throughout Europe. Still, throughout established manufacturers, there was considerable scepticism which made, e.g. the boss of Opel, Karl-Thomas Neumann state in 2015 that "we can achieve the CO2 targets without electrification. Every type of electrification is always the most expensive way, which is why we at Opel are trying to go the extra mile with highly efficient engines and transmissions" (Danisch, 2011: 526).

It is still the case that throughout the German automotive industry, there is a high restraint towards electric vehicles. After the "diesel gate", many involved producers, first and foremost Volkswagen started to invest in battery technologies or other forms of electrification and reformation of traffic. It remains questionable if VW went through a change of strategies after the scandal or if the effort had to be made in order to give VW a new image of a sustainable, modern and responsible manufacturer and company. It becomes apparent that throughout this process of strategy making towards electrification, manufacturers focus on not going over the statutory limits given by the EU, in order to avoid fines. The creation of sustainable mobility seems to have little relevance, which was ultimately also reflected in the manufacturers' strategies (Kronforst, 2019: 405-420).

Concluding, it seems like the manufacturer's strategy is not focusing on a fast transition towards electric-mobility. They have mainly entered research on electrification in a more substantial amount, after the public criticized the sector in a large amount, due to the diesel scandal. A reactive strategy can be observed, as changes are only driven by demands of the market, without own attempts of shaping mobility in Germany to new extents. The development happens rather incremental with little revolutionary attempts coming from the German automotive industry. The strategy of the sector focusses on the combustion engine whereas electric Vehicles are often compared to conventional motorized vehicles in terms of the range of the vehicle as well as the purchase price of the car. However, it is often overlooked that an

average consumer requires significant lower range as conventional cars offer. The comparison of conventional cars to electric vehicles remains the central argument used by the industry, hampering innovative mobility models. Electric vehicles are a new form of mobility and should not be seen as replacements for combustion powered vehicles only (Fournier et al., 2012).

As the previous analysis shows, the process of electrification of traffic is not urged to large extents by the manufacturers. Though, climate change is still a phenomenon which is currently taking place, putting politics in Europe in need to act. Different political organs from different organs have passed legislation which regulates the CO₂ reduction in Europe and Germany. Some of those legislatures do also target specifically the future of mobility regarding electrification, whereas a lot aim at reducing CO₂ in general, which implies the reduction of CO₂ emissions in traffic. This section showed, especially in contrast to the previous section, that a big change in the strategy of the German automotive industry has taken place after the Diesel-scandal. It is in question if the automotive industry developed genuine interest in ecological issues, though this chapter proves many of the hypothetical assumption from chapter two, such as market driven behaviour and image campaigning. Therefore, the following section will deal with the attempts made by the EU in order to reduce CO₂.

4.3 EU POLICY TARGETING TRAFFIC AND TRANSPORT

In 1992, the United Nations and its members agreed on the reduction of greenhouse gas emissions for the first time. Especially the European Union tried to be a pioneer in modern climate policy, which made them agree on a "120-gram CO₂ emissions per kilometre" target for new vehicles. This agreement was a reaction to the Kyoto meeting in 1997 as climate action was a significant part of the EU strategy since then. Germany, being pioneering especially in climate action, obligated itself as part of the "burden sharing" program to be responsible for 21 per cent CO₂ until 2012. The deal was made in order to make every state of the EU responsible for its actions (Goerne, 2007, 1-3).

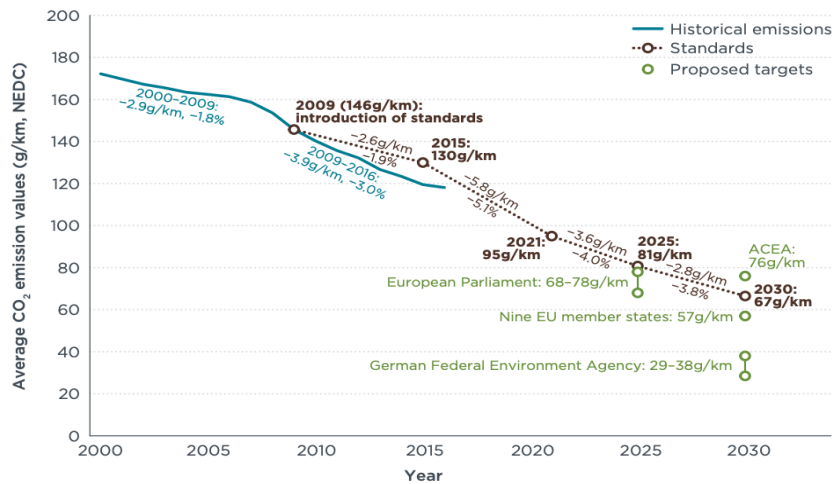


FIGURE 2 HISTORICAL AVERAGE CO₂ EMISSION VALUES, STANDARDS, AND PROPOSED TARGETS FOR EUROPEAN PASSENGER CARS. RATES IN G/KM AND PER CENT REFER TO ANNUAL RATES („EU CO₂ EMISSION STANDARDS FOR PASSENGER CARS AND LIGHT-COMMERCIAL VEHICLES", 2014).

Part of the agreement was also the target “20-20-20” which aimed at a 20% CO₂ emission reduction until 2020, compared to the value of 1990. Besides the 2020 targets which the European Commission decided on, this agreement included an 80-95% per cent reduction target until 2050 which went under the name ‘Roadmap for moving to a competitive low carbon economy in 2050’. It included all sectors which the central ejectors of CO₂ are; Agriculture, Energy, industry, buildings and transport. As the agreements made in the Kyoto-agreement ran out in 2012, in the followed years, there was little internationally binding agreement over new global CO₂ reduction goals. In order to still being able to reach the agreements made in the European Union, a target of averagely 130 gram per kilometre has been set until 2015. This target was set in order to put pressure on the European automotive industry. It was the German representation who campaigned for a “proportionate staggering from 65 percent of the new car fleet in 2012 to 100 percent in 2015” (“ETC/ATNI reports”, 2019) as well as a consideration of the weight of the vehicle which was especially crucial for the German automotive industry, considering the high rate of SUV sales by German manufactures. Those demands were made by the automotive industry and were nearly all covered in the proposal.

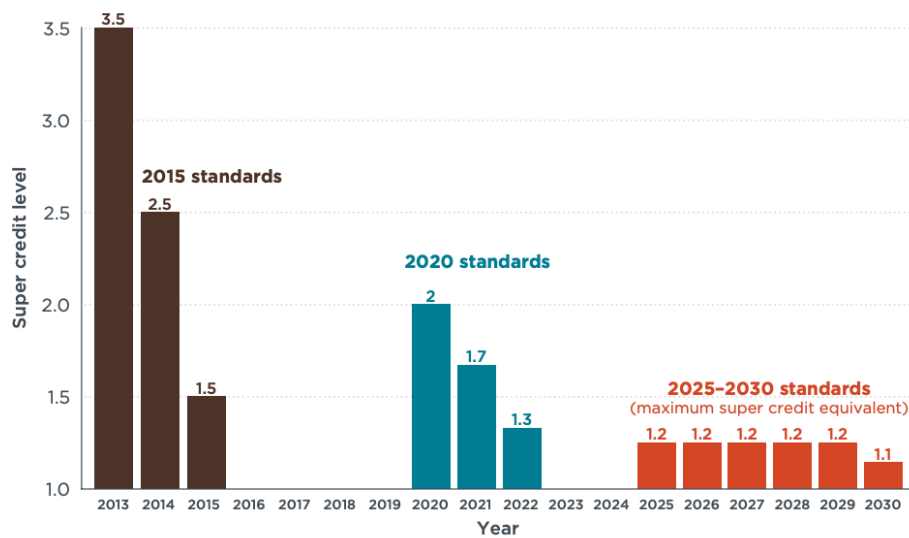


FIGURE 3 HISTORICAL SUPER CREDIT LEVELS IN EU PASSENGER CAR CO2 STANDARDS (WOLFRAM, P., 2016: 1-18).

Especially the 'super credit' system was essential to the sector, as they lead to multiple scoring in the calculation of fleet consumption for vehicles which emitted less than 50 grams per kilometre. Multiple scoring is also staggered from 3.5 times in 2012 and 2013 to 1.5 times in 2015. Starting from 2016 these vehicles count as one.

It becomes evident that the German government had a particular interest in protecting the automotive industry as far as possible while at the same time work towards the reduction of CO2 emissions. The super credit system was running until 2016 (COM, 2014). Throughout this time, different EU-states demanded to broaden the limit of emissions to a smaller number which Germany voted against, in order to give the industry more time to work on further technologies without the fear of losing profit. Aside from the mentioned regulations towards CO2 reduction in Europe, the union decided on regulations which target pollutants such as nitrogen oxides fine dust particles emitted from combustion engine vehicles. As there was no EU-wide bonus system, rewarding customers for purchases of low-emission vehicles, some Member states introduced national reward systems. Germany did not use bonus systems but raised taxes on gas between 1999 and 2003 by 15 cents. This bonus system was supposed to lead to more sales of vehicles with low CO2 emissions (Quadrelli, 2007).

In 2009, the German government broadened the tax to a CO2 regulation targeting the vehicle tax. This taxation leads to two euros extra, added on the existing tax, per gram of emitted CO2 per kilometre. After proposals of the automotive industry, the German government limited the tax, so it applies only to cars emitting more than 120-gram CO2 per kilometre. The Climate Conference of the United Nations in 2015 broadened the regulations of CO2 emissions once again. The significance of the meeting is the fact that all UN members agreed on emission reduction targets which are supposed to limit the climate warming to 1.5° Celsius with regular checks on the strategy in order to keep the negotiated schedule. As a response to this agreement, Germany agreed on a city-toll as well as further limitations towards more substantial vehicles. Even though those policies were agreed on in first place, they never became active in significant parts of Germany (Barthel et al., 2010: 19-36). The government of Germany appeared environmentally friendly throughout the conference, though hesitated in the implementation of the agreements in order to not put the automotive industry under high pressure. As competing manufacturers were mainly focusing on smaller vehicles, the German automotive industry does especially profit through high-class vehicles which are less environmentally friendly (Woyczehowski, 2014).

This section of the analysis gives deep insights on the strategy of the German automotive behaviour, by analysing the policy behaviour over the last decade. There were some attempts indeed, though the assumptions from chapter two were, that more and more drastic policy towards further electrification would have been implemented by the EU. Instead, many international agreements have been signed, the EU has taken over an avant-gardist role in environmental topics worldwide, still the result is not as avant-gardist as assumed.

4.4 EU TRAFFIC POLICY AFTER THE DIESELGATE

Following the 2015 climate conference, EU's policymakers decided on the next agreement with high significance for the automotive sector in July 2016. The European Strategy for low-emission Mobility (COM, 2016) was of especially interesting as it was the first large policy-package regarding mobility and traffic after the 'Diesel scandal' mentioned earlier in this thesis. It aimed at the targets formulated already in 2011 by the European Commission. "By mid-century, greenhouse gas emissions from transport need to be at least 60% lower than in 1990

and be firmly on the path towards zero. Emissions of air pollutants from transport that harm our health need to be drastically reduced without delay” (COM 2016) The Strategy included an action plan is based on three aspects:

1. Increasing the efficiency of mobility systems of all kind
2. support low emission substitutes for conventional transport
3. support low and zero emission vehicles through legislative and non-legislative action.

The package was separated into three mobility packages, which became effective in the period from May 2017 to May 2018. They included proposals on electrification infrastructure, especially for heavy-duty vehicles. The second package had its focus on the reduction of CO2 emissions as well as the support of alternative motorised, low-fuelled vehicles. Mobility Package three enhanced a smooth and safe transition of a possible reform of the traffic sector. It covered new security issues that arise with new vehicles spreading on the market. The third mobility package was the latest policy package that was particularly relevant for the transition towards further electrification of European traffic.

As the previous two sections showed, a strategy of the industry but also of policymakers regarding electrification of traffic in Europe and more specifically in Germany was possible to work out. Though, neither of the actors show specific strategies working towards a goal of electrification. The German automotive industry keeps its focus on market behaviour and therefore, possible profit, even if this means a slower process in the electrification of traffic. As analysed, they have taken measures to adapt towards further electrification, though it seems like they are acting in order to avoid possible penalties by the European Union for not adapting to CO2 reduction regulations.

On the other hand, Germany in the European Union kept acting rather protective towards the automotive industry in Germany. The policy that was passed was a restrictive policy but always limited to a bearable limitation for the industry. An avant-gardist strategy is recognisable comparing Europe to other markets, though it seems like their strategies are often designed to protect the European industry from transnational competitors. The strategy of the political

actors throughout Europe seems to have changed slightly, especially after 2015, when significant betrayals in the automotive industry unveiled. Since then, more dedicated politics throughout the EU member states can be observed, especially regarding the latest CO2 reduction goals and mobility package one to three (Regulation 2019/631, 2019). As the strategies of both parties are quite hesitant towards the full electrification of traffic in Europe and Germany, the question arises, how a change of the above stated and analysed strategies of both actors can lead to further electrification. Regarding the assumptions from chapter two, after the diesel-scandal, policy maker in the EU held their promises and showed more commitment towards further electrification. A lot of policy in order to regulate CO2 emissions has been implemented. Though, little incentivising policy has been implemented, which was also unexpected. The previous two chapters did well answer the second sub-question, regarding different aspects, which asked for strategies of the EU in the electrification process.

4.5 THE FAILURE OF GERMANY AND ITS INDUSTRY

The following section of this thesis will use the previously won enlightenment and answer the question at hand.

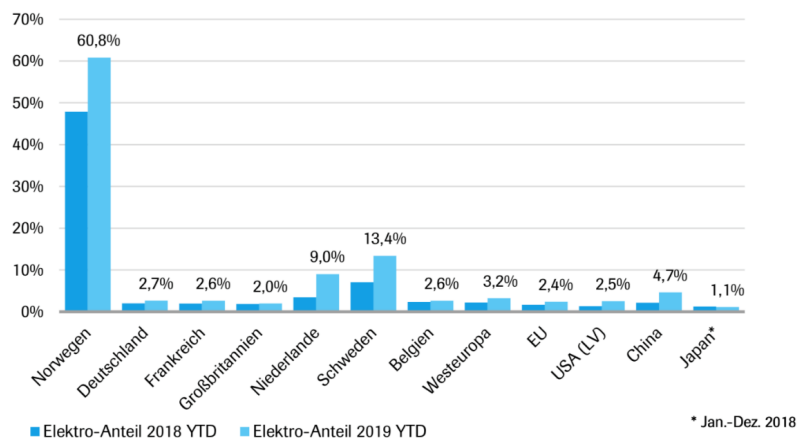


FIGURE 4 VERBAND DER AUTOMOBILINDUSTRIE – (VDA-ELEKTROBERICHT INTERNATIONAL, 2019)

In order to introduce this part of the analysis, this statistic shows the big difference between Norway (Norwegen) and Germany (Deutschland). It proves the significant gap between different states in their level of electrification. The light blue column shows the electric vehicle share in the first quarter of 2019, whereas the darker blue stands for the share in 2018. Norway

is already on a high level of electrification and has even improved this rate by over 10% in 2019, whereas Germany is still far below the 10% electrification rate. Norway, not being part of the European Union, seems to have found a better policy approach in terms of electrifying traffic, compared to the EU states which are all under the 15% share margin. The example of Norway shows that electric vehicles are already on the technological level to be used by the average consumer. The driving behaviour of Norwegian people is similar to the way German people use their car, averagely 15.000 kilometres per year. The majority of Norwegian people (81%) use their car every day while the study by Haugneland shows that 91% of the Norwegian people driving electric vehicles are pleased with them (Haugneland, 2014). Norway proves there is no issue with driving electric vehicles. The question, why the German and EU-electrification rate is as low as shown above, remains.

Besides that, it is of particular significance that a more substantial part (74%) of Norwegian vehicle users see the range of electric vehicles as a genuine inconvenience of electric cars, however just around one fifth of real electric vehicle clients (21%) share this appraisal (Feigenbaum et al., 2014). The same study showed that more than half of the Norwegian owners of electric vehicles feel like the range of the car is enough. Those results show that there is no issue with electric vehicles technological progress. It even proves the opposite: consumers from Norway who have had experience with electric vehicles are thinking better of those cars than uninformed consumers (Feigenbaum et al., 2014).

Therefore, this cannot be the reason why electrification in Germany is significantly lower than in Norway. As Norway has engaged electric mobility on an early stage, there is a higher chance of so-called diffusion. Diffusion research shows that every innovation is highly linked to the people adopting those innovations on an early stage. Those adapters are most likely not driven by monetary reasons but curiosity and adventurousness. This behaviour does add up to the fact that especially in Germany, customers of the automotive sector do not have monetary purchase reasons as their primary reasons to decide for a vehicle. The high rate of high-class vehicles and SUV's proves this behaviour in Germany (Bobeth & Matthies, 2016). Norway does have a higher rate of adoption of those innovations in general, as innovations are communicated and promoted to a high amount throughout Norway, which adds up to the list of reasons for high electrification of traffic in the country. Required for such a behaviour is the

previous positive experience with the product. Norway shows as a role model that diffusion of electric vehicles into traffic is possible by using specific measures. The state gives especially the financial incentive through significant vehicle tax reductions on electric vehicles is a measure which is also a psychological tool in order to fasten the diffusion of electric vehicles. Giving impulses in early stages of electrification seems to be an impactful tool in order to give costumers more experience with electric vehicles and therefore lead to a quicker process of diffusion of electric vehicles. Another example of accelerated diffusion is the subsidy for electric business vehicles, which is currently discussed in Germany. It is an idea which was first implemented in Norway, successfully. As nearly two-thirds of all new vehicles are business vehicles, incentivizing the selection of an electric vehicle will lead to a broader mass of electric cars on the streets which will also enhance the bespoken effect of diffusion (Wietschel et al., 2013).

In order to make the diffusion effect possible at first, sufficient information flow is needed. Another fact, speaking for the early and successful electrification in Norway is the large-scaled information campaign on electrification which happened in early phases of the electrification process. This information campaign enabled an equal discussion on the topic without economic driven propaganda. When deciding on the purchase of an electric vehicle, average customers will not consider the little number of times when they are possibly exceeding the maximum range of an electric vehicle. Sufficient information will take irrational fears of possible customers (Matthies et al., 2017).

Summing up, Norway did everything right in order to electrify traffic in the state. With over 70% electrification rate, they are currently leading in the electrification chart throughout Europe. This high electrification rate is due to supportive taxation towards electric vehicles as well as enough information. The Norwegian mentality is known for its support of innovations which is well reflected in the electrification of Norway.

After showing what Norway is and has been doing right during the last decade, it is necessary for the purpose of this thesis to compare it to the mistakes that have been done in EU as well as national politics regarding a successful electrification rate. The European Union is far from reaching the bespoken Paris Climate targets from 2005 (United Nations, 2015).

Transport and Environment, a Lobby group which is researching and campaigning the impacts of traffic on the environment have released their annual report at the end of 2018. This report criticizes the impact of traffic policies of the EU on the slow process of CO₂ reduction giving three main reasons for the slow electrification process and therefore the slow reduction of CO₂ throughout Europe ("CO₂ EMISSIONS FROM CARS: the facts", 2019). In this report, T&E states that this process is closely coherent with the high demand for individual mobility throughout European society. This individual mobility, focusing on car ownership, is not banned or curtailed by EU policies, such as tolls or higher Car taxations. A specific toll, dependent on the CO₂ emissions of a vehicle would lead to fewer incentives of using individual mobility, but to choose public transports instead. Also, other forms of mobility, such as car sharing or new models of individual mobility, would be more accepted throughout society. Innovation would, therefore, be supported to a more considerable amount, conditioned by higher tolls. Besides the development and application of new types of mobility, classical individual transport would be forced to become more sustainable and environmental-friendly.

As the EU is hardly passing any laws, which support mobility of modern kind, there is much room for development and improvement. New forms of mobility are broadly hampered by local regulations, for example, the ban on electric pedal scooters throughout Germany which existed until June 2019. Especially in cities, the EU but also Germany did not provide any space for innovation of transport, which results in the current situation of jammed cities with high CO₂ emission values (COM(2017)275/887835, 2017). This progress of smart mobility is also decelerated by the active deceleration of electrification by the automotive sector. Even though the past years have been the years with the most profit for the German automotive industry, the sector is not especially supportive towards a fast transition of traffic. The last years have been full of scandals, which consist of severe manipulation. This manipulation has occurred in testing procedures but also in sold vehicles, which lead to a large-scale product recall. Transport and Environment explain that especially the Start-Stop technology is an excellent example of slight manipulation. The adoption of this technology "has had a large impact on NEDC test results because the car is stationary for nearly a quarter of the test" (T&E, 2016). Testing circles are for this reason being reformatted, to the 'Worldwide Harmonised Light Vehicle Test' (WLTP). Still, it is under discussion if this testing cycle is as realistic regarding the representation of emissions as the final product is in real-world driving. Even with the renovated system, there

are specific measures used by automotive producers in order to manipulate testing results without cheating. This manipulation means that methods are developed which will lead to fewer emissions throughout the test, though it is very likely that those emission results will not be comparable to what the car will be emitting in real-world driving.

A method which is currently widely used is the deactivation of cylinders during testing. This deactivation of cylinders means that cars are programmed to use fewer cylinders and therefore, less fuel when they are driven in a specific way.

Model	Version - Model year	Engine - Transmission	Cylinder deactivation	Engine power - torque	0-100 km/h	CO2 emissions
Ford Fiesta VI	ST200 (2017)	L4 1.6-litre turbo petrol - Manual 6	No	200hp - 290Nm	6.7s	140g/km
Ford Fiesta VII	ST (2018)	L3 1.5-litre turbo petrol - Manual 6	Yes	200hp - 290Nm	6.5s	114g/km
Volkswagen Golf VII	1.4 TSI BlueMotion Technology (2017, FL)	L4 turbo petrol - Manual 6	No	125hp - 200Nm	9.1s	120g/km
Volkswagen Golf VII	1.5 TSI EVO BlueMotion (2017, FL)	L4 turbo petrol - Manual 6	Yes	130hp - 200Nm	9.1s	113g/km

FIGURE 5 VOLKSWAGEN - ACTIVE CYLINDER TECHNOLOGY ("CO2 EMISSIONS FROM CARS: THE FACTS", 2019)

Though it cannot be expected that customers will drive their car in the way professionals drove it throughout the testing period. Therefore, the emissions can be expected to be as high as they would be without Cylinder deactivation. This example shows well which methods are used in order to present sustainable and low-emission vehicles without really changing engines to a large extent. Neither the European Union nor Germany has managed to find regulations which will take away this method of manipulation throughout testing circles and decide on a testing system which leads to representable and correct emission results. A failure of the automotive industry as well as of the responsible policy-making organs, the European Union, as well as the Member states, is the origin of this issue.

This issue goes hand in hand with a much bigger issue, having an impact in all of the policies which are economy related. As I can speak from my own experiences, working in the core of the German automotive industries Brussels office, the influence of lobbyists on policymakers is still tremendous. The automotive industry, as one of the largest Job donators throughout the EU still after all scandals, has good relations to policymakers in the member states as well as

the EU. As explained earlier, the relations have been good ever since, which leads to the danger of influencing policy inputs and outcomes. Especially the eastern European states are highly dependent on the jobs which are offered by the automotive industry. This economic relevance often leads to very significant political influence.

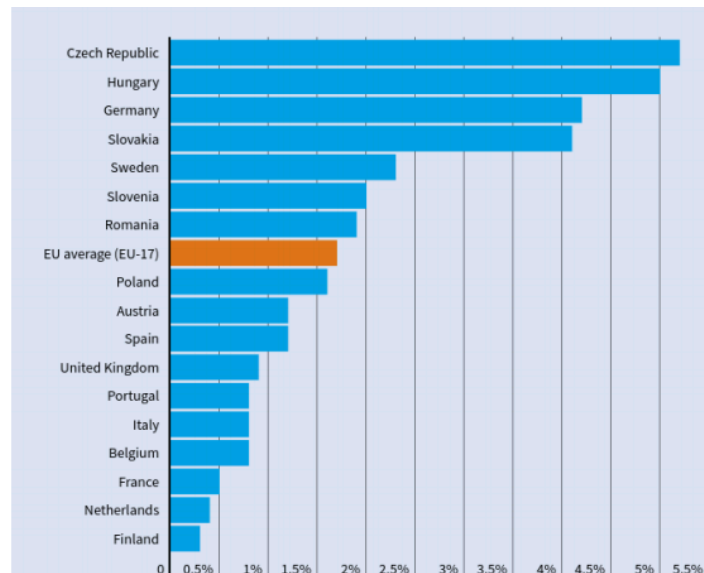


FIGURE 6 SHARE OF THE AUTOMOTIVE INDUSTRY IN NATIONAL GROSS VALUE ADDED ("CO2 EMISSIONS FROM CARS: THE FACTS", 2019)

The graphics designed by T&E displays the tax income of different states received by the Automotive sector in relation to the national Gross Value Added. The graphic displays the significance of the automotive industry to the states wealth well. As seen, the economic importance is very high, which explains the still existing strong political influence. Germany as a country with different sectors of all kinds and a high GDP compared to the eastern European countries is still on the third-place which templates well the influence of the German automotive industry to the German state (T&E, 2016).

With the high level of economic influence, it is also apparent that the automotive sector has high rates of employment throughout the European Union. Though, significantly, not only jobs in the origin countries of the manufacturers are highly dependent on the automotive sector, also notably the eastern European countries show high job dependency of the German automotive industry, as production sites have been outsourced to those states in order to

produce cheaper. Eastern European countries are mainly producing parts which are then later compounded in the originating country of the company.

This section showed specifically where and when the mistakes have been made on either side, political and economic. The distinction from Norway underlines the slow-thinking policymaking of the EU regarding environmental issues. Incrementalism is one of the strengths of the EU as it leads to steady politics but issues like climate action need quick and efficient policy, like Norway implemented. The assumptions from chapter two were proven to be right. Also, the last sub-question was answered in this chapter as deep insights into the more effective policy-making of Norway was achieved, compared to the EU-policies.

4.6 CONCLUSION OF THE ANALYSIS

In conclusion, Germany and the EU have been acting erroneously regarding a fast and effective transition towards electrification. The high level of economic dependency leads to a high level of political influence, which does, on the other hand, lead to events like the disregard of manipulative behaviour on the side of the industry.

The big failure of EU politics lays in inconsistent policy-making towards the electrification of traffic, whereas the industry is not acting innovative enough in order to ensure a transition on its account. Norway seems to have found an easy way to initiate electrifications efficiently. By having a broad span of incentivising measures and policy, such as electricity for a very low price, as well as a high developed infrastructure throughout the country, electrification seems to happen faster. As it is no longer a luxury to own an electric vehicle, but convenient, the market tends to drive electrification further. On the other side, EU policy is restrictive, with little innovative character. While clashing with the automotive sector, little progress towards electrification of traffic is to be recognized. The European restricting policy regarding CO2 limitations seems to have less effectivity than the Norwegian innovative approaches.

5. CONCLUSION

5.1 THE GENERAL ANSWER TO THE RESEARCH QUESTION

Concluding, one can say there are attempts of the automotive industry in order to keep up with the process of electrification. Though, throughout this thesis, one was able to work out that those attempts are more of economic interest than of ecological interest, which leads to an incremental process of electrification with little innovative initiatives made by the sector. After the Diesel scandal, the German automotive industry has made some advancements towards the production of more electric powered vehicles. Still, the economic focus remains, and an image campaign is recognisable in this electrification movement of the sector. Little adaption towards fully electrified traffic can, therefore, be observed.

Policy makers in the environment of the European Union have made quite a lot of attempts in order to reduce CO₂ emissions throughout the last decades. Still, there is no revolutionary policy which has been implemented throughout the last decades in order to drive the electrification process significantly further. The strategies of the EU focus on the reduction of CO₂. Until this point, this does not yet include full electrification. Even though the EU has taken many measures regarding the limitation of emissions in European traffic, these have not focused on fully electrified European traffic yet. Until today, nothing was effective enough in to achieve environmentally friendly transport in the EU. As portrayed in the analysis chapter, the policies which were made by the EU in order to lessen the impact of the industry on the environment are - regarded as a whole and compared to Norway- always made with the protection of the automotive industry and the jobs tied to them in mind.

In contrast to Norway, Germany and the EU have different assets, Germany is in the EU and mostly economically dependent on the performance of the automotive sector on the one hand, whereas Norway is making independent, innovative policies with a high chance of diffusion to the society. The logic of context after Baumgartner et al. (2009, p.7-42) does gain special significance in this issue. This logic is recognised in little limiting policies but many incentivising policies which were used to reach the current high electrification rate in Norway. In contrast to that, Germany shows little innovative policies with incremental market-driven strategies in

order to reach further electrification. The independent variable, the strategies of the different stakeholders, are therefore well chosen in order to explain the dependent variable, the level of electrification.

The lack of impactful change in the electrification of the German automotive industry is therefore well explained by answering the above-stated sub-questions. It is composed by market-driven policy-making in an incremental moving system with the long-term objective of reaching higher electrification.

The insights explained previously are to some extent eye-opening, as none of the stakeholders mentioned in this thesis seems to follow a strict strategy, especially after the 'diesel-scandal'. Other scholars are mostly discussing the issue at hand on one single level. This thesis is of significant relevance as there is no research, yet which explains and differentiates the state and progress of electrification of traffic to an extent as this thesis does.

5.2 LIMITATIONS OF THE RESEARCH

As the topic is of high controversy, many scholars enlighten the topic from one side mainly. After working for the association of the German automotive industry, I was able to research driven by the experiences I have made. For further research, it would be fascinating to apply the research approach at hand on different levels, as this thesis compares EU-policy to non-EU policy. A case like Sweden shows, there are also differences in the electrification process in the same polity. As those differences are not of the same significance as the differences between Germany and Norway, it would take more time and work to work out and explain the reasons for the different levels of electrification. Thus, a study dealing with fundamental EU differences in electrification level would be interesting for further research.

This research templates and analyses the reasons for different levels of electrification based on different policies. Though, there could have been more independent variables besides the different policies in the two polities at hand in order to explain the dependent variable, the process of electrification. This thesis deals with other reasons for high or low levels of electrification, although the focus is put on policies of the state. For the analysis of the automotive industry, this thesis focused mainly on the reaction and justification of its actions

in order to explain their market-driven strategy. As they are profoundly influencing the policy-making process of the EU as well as of Germany, analysing the actual influence on these decision-making processes would be compelling.

Throughout this research, there is always new input from new research, which is published. As stated earlier, this research is often influenced either by ecological or economic driven research. By using primary data given by the European Union and secondary sources from ecological as well as automotive lobby groups in order to analyse their strategies, this thesis enlightens both principal stakeholder strategies. A very recent study, published by ACEA, the European Automobile Manufacturers' Association states that there is a correlation between the uptake of electric cars and GDP in the EU. It does not test any causalities, though it would be profoundly interesting to explain a high level of electrification only with a higher GDP. Therefore, the ACEA explains Norway and its far-developed electrification process are based on the GDP of Norway, which is more than twice of the EU average GDP. Therefore, they try to relativise the process as an exceptional outlier in Europe. Indeed, higher GDP gives more options for action for the state. Also, the chance of diffusion is higher in a wealthy society, as poor societies do not have the capabilities to adapt to some innovations. Though, the previous research has shown that much more than just a high GDP has led to outstanding development. The GDP of Germany is not far lower than the Norwegian, though the rate of electrification is a lot lower. Considering the GDP as a variable in further research would still be an exciting research approach, which would give further insight into possible causal relations between electrification and the wealth of a state.

5.3 IMPLICATIONS FOR POLICY AND GOVERNANCE

In order to round this thesis up, this section of the thesis will try to give specific policy recommendation to what Germany and the EU could do in order to reach a higher level of electrification. It is tough to find adequate policy recommendations as EU policymakers have tried to implement policies which will eventually lead to more electrification by reducing CO2 emissions over the last decades. As analysed in previous chapters, the solution of the issue is highly political with many economic influences on the issue. Therefore, economic and financial but also other strategical measures have to be taken in order to reach a level of electrification, which is comparable to Norway. A first measure which would lead to convincing the early adopters is giving more financial incentives. Therefore, subsidisation of the first 10 per cent of EVs in Germany or Europe, for example in terms of cutting the VAT on those vehicles, would lead to more purchases of electric vehicles. Especially the big fear of losing money through a purchase of an electric vehicle (as purchase prices are until today higher than of conventionally motorised vehicles), would be smaller. The effect could even be used the other way around as people would be afraid of missing out a bargain and therefore might buy an electric vehicle even faster.

Following those short-term monetary incentives, a long-term model is needed, which is adequate for traffic in cities in the 21st Century. Those long-term promotion models have to consider new forms of mobility and integrate those in their strategy. An incentive could, for example, be the reduction of VAT on carsharing with electric vehicles. This incentivisation would lead to more presence of electric vehicles on the road but might also lead to fewer cars in general.

All those campaigns have to be based on an extensive and intensive information campaign which gives possible costumers facts about electric vehicles and takes away irrational fears which are possibly fomented by the automotive industry. Information campaigns could target the specific important group of early adopters which could be households with multiple cars, for example. The last obvious action option is the drastic expansion of infrastructure. Those have to be more visual and stable in order to build a network of infrastructure needed for electric vehicles. More visibility of infrastructure for charging will lead to less fear of electric

vehicles and will practically enhance the user experience of electric vehicle drivers. Charging points have to be explicitly built at places where cars are stationed for a more extended period, such as outside of companies or homes. Spreading charging stations in public parking areas will lead to more visibility and to less fear of not having enough battery reach. Another essential location for charging stations would be next to highways. Fast charging poles are already charging vehicles within 30 minutes. Spreading those fast-charging stations to highways will make it possible to reach further destinations with electric vehicles. The last policy recommendation is to make electric vehicles more attractive than conventional vehicles. This incentivisation can take place, for example, by letting them use the bus lanes or by letting them park and charge for free in public parking.

Throughout economy and politics, the future of electric cars is convincing to everyone. It is time for Germany and the EU to start acting in favour of the environment, not the economy.

6. LITERATURE

- 2030 Energy Strategy - Energy - European Commission. (2019). Retrieved from <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy>
- A European Strategy for Low-Emission Mobility. (2019). Retrieved from <https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-501-EN-F1-1-ANNEX-1.PDF>
- Barthel, K. (2010). Zukunft der deutschen Automobilindustrie (pp: 19-36). Bonn: Friedrich-Ebert-Stiftung, Abt. Wirtschafts- und Sozialpolitik.
- Barton, A., & Lazarsfeld, P. (1955). *Some functions of qualitative analysis in social research*. Indianapolis, Ind.: Bobbs-Merrill, College Division.
- Baumgartner, F. (2009). Lobbying and Policy Change: Who Wins, Who Loses, and Why. (122-141) University of Chicago Press.
- Berkhout, J. (2013). Why interest organizations do what they do: Assessing the explanatory potential of 'exchange' approaches. *Interest groups & Advocacy*, 2(2), 220-250.
- Bernhagen, P., & Mitchell, N. J. (2009). The determinants of direct corporate lobbying in the European Union. *European Union Politics*, 10(2), 155-176
- Beyers, J., Eising, R., & Maloney, W. (2013). Interest Group Politics in Europe (pp:1188-1211). Hoboken: Taylor and Francis.
- Blöcker, A. (2015). Industrielle Wertschöpfungsketten: Herausforderungen für das deutsche Industriemodell am Beispiel der Automobilindustrie. *WSI-Mitteilungen*, 68(7), 534-541. doi: 10.5771/0342-300x-2015-7-534
- Borgeest, K. (2017). Manipulation von Abgaswerten: Technische, gesundheitliche, rechtliche und politische Hintergründe des Abgasskandals. pp: 7-12 Springer-Verlag.

- Bratzel, D. (2018). *Der Abgasskandal und die Vertrauenskrise im Automobilmarkt – Ursachen, Lösungen und Auswirkungen auf den Verbraucher* [Ebook]. Bergisch Gladbach: CAM. Retrieved from https://www.vzbv.de/sites/default/files/downloads/2018/09/13/cam_gutachten_vertrauenskrise_im_automobilmarkt_v1.1.pdf
- CAM. (2019). *E-Mobilität im internationalen Vergleich..* Retrieved from https://autoinstitut.de/index_htm_files/Pressemitteilung_Elektro_2018_2019.pdf
- Coen, D. (1997). The European business lobby. *Business strategy review*, 8(4), 17-25.
- Coen, D. (1998). The European business interest and the nation state: large-firm lobbying in the European Union and member states. *Journal of Public Policy*, 18(1), 75-100.
- Coen, D., & Richardson, J. (2009). Learning to lobby the European Union: 20 years of change. *Lobbying the European Union: Institutions, Actors and Issues*, 3-18.
- Conrad, M., & Oberhauser, M. (2018). Volkswagen und der Dieselskandal. *Wist - Wirtschaftswissenschaftliches Studium*, 47(7-8), 42-44. doi: 10.15358/0340-1650-2018-7-8-42
- CO2 EMISSIONS FROM CARS: the facts. (2019). Retrieved from https://www.transportenvironment.org/sites/te/files/publications/2018_04_CO2_emissions_cars_The_facts_report_final_0_0.pdf
- Danisch, R. (2011). 32. Wiener Motorensymposium Symbiose im Antrieb. *MTZ-Motortechnische Zeitschrift*, 72(7-8), 526-527.
- Der Abgasskandal und die Vertrauenskrise im Automobilmarkt | Bundesverbandes eV, V., & Bratzel, S. (2019). Retrieved from <https://www.vzbv.de/dokument/der-abgasskandal-und-die-vertrauenskrise-im-automobilmarkt>
- EC Regulation (EU) 2019/631 No 443/2009 and (EU) No 510/2011 (Text with EEA relevance.). (2019). Retrieved from <https://eur-lex.europa.eu/eli/reg/2019/631/oj>

- Eising, R. (2004). Der Zugang von Interessengruppen zu den Organen der Europäischen Union: eine organisationstheoretische Analyse. *Politische Vierteljahresschrift*, 45(4), 494-518.
- Electric Vehicle Index | Deutschland. (2019). Retrieved from <https://www.mckinsey.de/elektromobilitaet>
- Elektrifizierungsbericht. (2019). Retrieved from: https://auto-institut.de/index_htm_files/Pressemitteilung_Elektro_2018_2019.pdf
- ETC/ATNI reports, Overview of Low-Carbon Development Strategies in European countries Information reported by Member States under the European Union Monitoring Mechanism Regulation. (2019). Retrieved from <https://acm.eionet.europa.eu/reports/#tp#>
- EU CO2 EMISSION STANDARDS FOR PASSENGER CARS AND LIGHT-COMMERCIAL VEHICLES. (2014). Retrieved from https://theicct.org/sites/default/files/publications/ICCTupdate_EU-95gram_jan2014.pdf
- Europe needs to slash its transport emissions by 94% by 2050 - Effort Sharing Regulation | Transport & Environment. (2019). Retrieved from <https://www.transportenvironment.org/publications/europe-needs-slash-its-transport-emissions-94-2050-effort-sharing-regulation>
- Figenbaum, E., Kolbenstvedt, M., & Elvebakk, B. (2014). Electric Vehicles—environmental, economic and practical aspects. As seen by current and potential users.
- Fontaras, G., Zacharof, N., & Ciuffo, B. (2019). Fuel consumption and CO 2 emissions from passenger cars in Europe – Laboratory versus real-world emissions.
- Fournier, G., Würzer, D., Seign, R., & Hinderer, H. (2012). Der Weg zur emissionsfreien Mobilität. (405-423) In P. Schönharting, J. Schramm & D. Ziegler, *Zukünftige Entwicklungen in der Mobilität*. Gabler Verlag.
- Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research policy*, 31(8-9), 1257-1274.

- Goerne, G. (2019). Chronologie: UN-Klimaverhandlungen. Retrieved from https://www.greenpeace.de/sites/www.greenpeace.de/files/Chronologie_Klimakonferenz_en_1.pdf
- Grimm, V., Rückel, B., Sölch, C., & Zöttl, G. (2016, August). Zur Reduktion des Netzausbaubedarfs durch Redispatch und effizientes Einspeisemanagement: Eine modellbasierte Abschätzung. In *List Forum für Wirtschafts-und Finanzpolitik*(Vol. 41, No. 4, pp:465-498). Springer Berlin Heidelberg.
- Haugneland, P. (2014). Norwegian electric car user experiences 2014. European Electric Vehicle Congress, Brüssel
- Hix, S. (2011). The political system of the European Union. Basingstoke: Palgrave Macmillan.
- Hüttenrauch, M., & Baum, M. (2013). (pp.17-25) *Effiziente Vielfalt*. Berlin: Springer.
- Kalbfell, K. H. (2004). Markenführung in der Automobilindustrie—am Beispiel der BMW Group. In *Handbuch Markenführung* (pp:1927-1952). Gabler Verlag, Wiesbaden.
- Klüver, H. (2009): Measuring Interest Group Influence Using Quantitative Text Analysis [Electronic version]. *European Union Politics*, 10 (4), 535-549.
- Kronforst, N. (2019). Digitalisierung als Gegengewicht zum Dieselgate—Betrachtung der externen Risikokommunikation der VW AG. In *Digitalisierung und Kommunikation* (pp:405-420). Springer VS, Wiesbaden.
- Lamprecht, T. (2018). Die Beziehungen zwischen der Automobilindustrie und der Politik-Wie wird Einfluss genommen und welche Regulierungsmöglichkeiten bestehen? (Doctoral dissertation).
- Langer, M. (2008). *Die Kooperations-Strategie*. Saarbrücken: VDM Verlag Dr. Müller.
- Leif, T., & Speth, R. (2003). Lobbyismus in Deutschland. *Forschungsjournal Soziale Bewegungen*, 16(3), 24-36. doi: 10.1515/fjsb-2003-0308

- Lelieveldt, H., & Princen, S. (2011): *The Politics of the European Union*. Cambridge: Cambridge University Press.
- Lowery, D., Poppelaars, C., & Berkhout, J. (2008). The European Union interest system in comparative perspective: a bridge too far?. *West European Politics*, 31(6), 1231-1252.
- Lösche, P. (2007). *Verbände und Lobbyismus in Deutschland*. Stuttgart: Kohlhammer.
- Mai, M. (2019). Verbände und Politikberatung. In S. Falk, D. Rehfeld, A. Römmele & M. Thunert, *Handbuch Politikberatung* (pp:268-274). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Matthies, E., Bobeth, S., Klöckner, C., & Schippl, J. (2017, January). Zur besseren Verbreitung von Elektroautos–Was können wir in Deutschland von Norwegen lernen?. In *Die Energiewende verstehen-orientieren-gestalten* (pp:531-546). Nomos Verlagsgesellschaft mbH & Co. KG.
- Mazey, S., & Richardson, J. J. (Eds.). (1993). *Lobbying in the European community*. Oxford University Press
- Michalowitz, I. (2007). What determines influence? Assessing conditions for decision-making influence of interest groups in the EU (14th ed., pp:132-151). 1. *Journal of European Public Policy*.
- Odyssee Database. (2015). IEA, in: Institut der deutschen Wirtschaft Köln, *Für eine bessere CO2-PKW-Regulierung in Europa – 14 Thesen*”. Tanmedia, Köln.
- PSA-Opel fusion shakes up European production footprint. (2019). Retrieved from <https://europe.autonews.com/article/20171101/ANE/171019654/psa-opel-fusion-shakes-up-european-production-footprint>
- Quadrelli, R., & Peterson, S. (2007). The energy–climate challenge: Recent trends in CO2 emissions from fuel combustion. *Energy policy*, 35(11), 5938-5952.

- Real Driving Emissions (RDE) Test | European Automobile Manufacturers' Association (ACEA). (2018). Retrieved from <https://www.acea.be/industry-topics/tag/category/real-driving-emissions-test>
- Reducing CO2 emissions from passenger cars - Climate Action - European Commission. (2019). Retrieved from https://ec.europa.eu/clima/policies/transport/vehicles/cars_en
- Revision of the Eurovignette Directive 1999/62 - COM(2017)275/887835. (2019). Retrieved from https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-275_en
- Schmedes, H. (2008). *Wirtschafts- und Verbraucherschutzverbände im Mehrebenensystem*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Schmitter, P., & Streeck, W. (1999). The organization of business interests (p. MPIfG discussion paper). Köln: Max-Planck-Institut für Gesellschaftsforschung.
- Straßner, A. (2006). Funktionen von Verbänden in der modernen Gesellschaft. Retrieved from <http://www.bpb.de/apuz/29798/funktionen-von-verbaenden-in-der-modernengesellschaft?p=all> .
- Tschöke, H. (2015). Die Elektrifizierung des Antriebsstrangs (pp:38-58). *Basiswissen Springer-Vieweg, Wiesbaden*.
- United Nations FCCC. COP.21 (2015). *Adoption of the Paris Agreement*. Retrieved from: <https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>.
- Wahrig, Gerhard (1985): Fremdwörterlexikon. München: Verlagsgruppe Bertelsmann GmbH/ Mosaik Verlag.
- Wallentowitz, H., Freialdenhoven, A., & Olschewski, I. (2009). Strategien in der Automobilindustrie (pp:29-38). Wiesbaden: Vieweg+Teubner Verlag / GWV Fachverlage GmbH, Wiesbaden.
- Wiesendahl, Elmar (2010): Rationalitätsgrenzen politischer Strategie. In: Raschke/Tils (Hrsg.), Strategie in der Politikwissenschaft. Konturen eines Forschungsfelds. Wiesbaden: VS Verlag, 21 – 44.

- Wietschel, M.; Plötz, P.; Kühn, A. & Gnann, T. (2013): Market start-up scenarios for electric vehicles. Abstract. Karlsruhe: Fraunhofer ISI.
- Willems, U., & Winter, T. (2019). Interessenverbände als intermediäre Organisationen. Zum Wandel ihrer Strukturen, Funktionen, Strategien und Effekte in einer veränderten Umwelt. In U. Willems & T. Winter, *Interessenverbände in Deutschland* (pp:13-50). Wiesbaden: VS Verlag.
- Wolfram, P., German, J., Mock, P., & Tietge, U. (2016). Deployment of passenger car technology in Europe and the United States. (pp:1-18) *The International Council on Clean Transportation*.
- Woyzechowski, N. (2014). Die Zukunft der Elektromobilität in Deutschland: Sind eine Million Elektrofahrzeuge bis 2020 ein realistisches Ziel der Bundesregierung?. Diplomica Verlag.