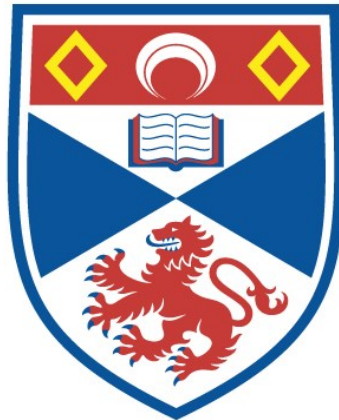


THE GERMAN AUTOMOTIVE INDUSTRY AT A
CROSSROADS: AN EXPLORATIVE CASE STUDY OF THE
COMMUNICATION OF ELECTRIFICATION

Tobias Manuel Hein

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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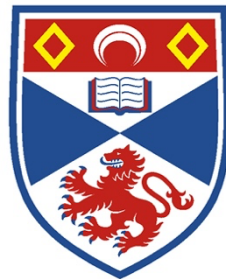
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The German automotive industry at a crossroads: An explorative case
study of the communication of electrification

Tobias Manuel Hein



University of
St Andrews

This thesis is submitted in partial fulfilment for the degree of

Doctor of Philosophy (PhD)

at the University of St Andrews

February 2022

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Abstract

The German automotive industry is facing the most challenging and demanding change in its 130-year history. It finds itself at a crossroads with an unknown future ahead. The renunciation of internal combustion engines and the pressure to replace them with emission-free electric engines poses an immense challenge to the entire industry. This thesis examines how electrification as a pro-environmental change is communicated and perceived, and how its communication differs from conventional change communication.

An explorative case study structure was applied. It focuses on three automotive companies from South-West Germany, of which two are supplier companies, and one is an original equipment manufacturer. In total, 41 participants took part in semi-structured interviews. Secondary data in the form of publications issued by the government and automotive companies were additionally analysed. Moreover, observations at the study locations were undertaken to gain an understanding of how electrification as a change impacts the work environment of this thesis' participants.

This thesis found that the perceptions of electrification differ between automotive companies and are linked to the extent to which corporate cultures, business models, and individual beliefs support and facilitate pro-environmental actions. Moreover, an understanding of how German automotive companies attempt to communicate electrification was established. This thesis shows that companies discontinue their established change communication processes and replace them with new communication methods. In response to electrification, the case study companies created communication methods that they have never used before to communicate changes, showing the uniqueness of this pro-environmental change. This research is the very first academic contribution that explores automotive companies' communicative responses to electrification and the perceptions towards electrification and its communication. Thus, this thesis aims to understand how automotive companies address electrification and how they utilise new communication methods in the pursuit of moving transportation into a new age.

Glossary of Acronyms and Abbreviations

BAFA - Federal Office for Economic Affairs and Export Control

BEV - Battery Electric Vehicle

BMF - Federal Ministry of Finance (GER)

BMUV - Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

BW- Baden-Wuerttemberg

CEO - Chief Executive Officer

CSR- Corporate Social Responsibility

EnBW- Energie Baden-Wuerttemberg (energy company from South-West Germany)

FCEV - Fuel Cell Electric Vehicle

HIO - High-Involvement Organisation

HR - Human Resources

ICE - Internal Combustion Engine

ICT - Information Communication Technology

IEA – International Energy Agency and Organisation for Economic Co-Operation and Development

MNC - Multinational Corporation

NCNUSA - National Commission on Neighborhoods (USA)

NDA - Non-Disclosure Agreement

OCC - Organisational Change Cynicism

OEM - Original Equipment Manufacturer

PEB - Pro-Environmental Behaviour

PHEV - Plug-in Hybrid Electric Vehicle

PR - Public Relations

PWC- PriceWaterhouseCooper

SSI - Semi Structured Interview

Definitions

Automotive company - The term 'automotive company' is used to refer to any company in the automotive sector.

Automotive supplier company - Automotive supplier companies are all companies that produce car or engine parts and sell them to automotive OEMs

Conventional change - Conventional changes are any internal changes that happened during or before electrification and were not connected to the current pro-environmental changes. This term was used by study participants to describe any structural or organisational changes that were taking place in their company. Conventional changes have a broad definition but were described by participants to be e.g., the merger of departments, the implementation of new computer systems or changes of company internal processes. While each of these conventional changes might also have significantly impacted the employees and managers, all (conventional) changes prior and during electrification followed pre-defined company change processes and communication processes. Thus, conventional changes can be differentiated from electrification through the presence of pre-defined change processes.

Electrification - Pro-environmental change which requires automotive companies to build emission-free electric engines and consequently requires them to reduce the construction of ICEs.

Employee - Any study participant that does not have a leading task or any management responsibility in the automotive companies and is a subordinate, consequently answering to managers above him.

Manager - Has leading tasks and management responsibilities. Consequently, has employees below them and is responsible for the strategic planning and communication of electrification.

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1. Chapter One: Introduction

1.1 Background: Electrification as an epochal turn of times

Automotive companies worldwide face an immense challenge because of the global rethinking on sustainability, forcing the automobile industry above all to reduce carbon emissions of their products sustainably. Automotive companies in South-West Germany, where the automobile was invented and still has an immense significance for the economy, face pro-environmental changes resulting from electrification. The automotive industry has built ICEs for over 130 years, a period in which the industry never had to rethink the very product that constitutes the driving force behind cars and the German economy, namely the ICE.

Throughout the history of the automotive industry many different approaches regarding drivetrains have been taken, and therefore many different drive systems have been developed. Contrary to popular belief, the electric engine is not a new drive system but was produced as early as the 1870s, making it almost as old as the ICE (Guarnieri, 2012). The electric engine saw a rise in popularity until the beginning of the 20th century; even Emperor Wilhelm II of Germany possessed a Mercedes ‘Electricque’, which was produced in 1906 for the commercial market (Media-Daimler, 2010). However, the development of drivetrains was ultimately required to meet customer demand for reliable technologies with longer ranges than electric engines, which only managed to travel 30-60 kilometres, making them impractical for customers at the time (Guarnieri, 2012). Facilitated by two world wars, the ICE ultimately became the indisputable champion of drivetrains during the 20th century.

During the second half of the 20th century, automotive companies allocated a significant amount of money to research projects to answer the question: what will the car of the future look like? Consequently, the wide range of drivetrain systems that are available today emerged through their research. In the 1970s, internal fuel cells vehicles (FCEVs) were at the centre of companies’ attention as a new, innovative drive system. This attention shifted in the 1990s towards battery-powered electric cars (BEVs). Synthetic fuels and biofuels were developed in the early 2000s, but both fuel types lost momentum, and since the early 2010s BEVs and plug-in hybrid electric vehicles (PHEV) have been reintroduced to the market and subsidised

accordingly to meet sustainability demands (Bakker & Farla, 2015; Bormann et al., 2018; Dijk et al., 2013; Sierzchula et al., 2014; Sperling & Gordon, 2010).

Putting this work into the context of change communication and change management in the German automotive sector is significant because, currently, there is no other industry in Germany that is required to change as drastically and as promptly as the automotive industry (Bormann et al., 2018; Bratzel & Thömmes, 2018; Gell & Thran, 2021; Mönnig et al., 2018; Sihm et al., 2012). New forms of mobility and drivetrains are required to meet the standards of emission-free and green mobility, forcing car manufacturers to move in the opposite direction of conventional ICEs. Considering how mobility systems will develop until 2030, when all cars in Germany will need to be emission-free, it becomes apparent that the automotive industry faces many changes and challenges that will impact internal company structures and especially production processes (Gell & Thran, 2021; Mönnig et al., 2018; Sihm et al., 2012). By 2030, the German automotive industry is predicted to produce 17 million PHEVs, 6 million BEVs and 110,000 fuel-cell vehicles (Mönnig et al., 2018; Sihm et al., 2012). If we compare these forecasting estimates to the green mobility production figures of the year 2015, when automotive manufacturers only produced 1 million BEVs, no fuel-cell vehicles and only 2 million PHEVs, it becomes apparent that electrification constitutes a significant challenge to the automotive industry.

The new pro-environmental changes which emerge in automotive companies require companies to adapt and change their products and working processes. Therefore, change management, and the adequate communication of new changes regarding electrification and pro-environmental products to the employees, presents itself as a new and substantial challenge for the whole automotive industry.

1.2 Why is electrification different to conventional changes?

Change and change communication are fundamental components of functioning corporations. Changes in all companies and all industry sectors happen daily and allow companies to adapt to new market requirements, new technological changes, and innovations, and thus satisfy new customer needs. Therefore, managers and employees are constantly required to adapt quickly

to new challenges and to change their way of working accordingly. Most conventional changes¹ are decided internally in companies since management boards and project teams try to adapt to new challenges and thus create change strategies for companies to meet new market conditions. However, in this regard, electrification is completely different to ordinary changes since the companies' necessities to meet new market demands is not necessarily a reaction to market developments or customer needs but rather a reaction to additional outside pressures. Politics, society and customers demand mobility to become greener and more sustainable and put a significant amount of pressure on automotive companies to adopt greener mobility solutions and to reduce carbon emissions (BAFA, 2020; Bakker & Farla, 2015; BMF, 2020; IEA, 2021; Khare & Bellmann, 2008; Wittmann, 2017).

Leinemann (2011) stated that the European Union aims to limit climate changes' impact on the world's temperature to below 2 degrees Celsius, which requires an 80% to 95% reduction of carbon emissions by 2050 compared to 1990. By using alternative drivetrains in the transportation sector, such as BEVs, PHEVs or fuel-cell vehicles, this goal can potentially be achieved if implemented swiftly. However, while politicians across the world have a similar vision, namely, to drastically reduce carbon emissions, their proposed approaches differ from each other, which leaves the industry without a clear direction since companies rely on outside investments and imports when addressing new innovations like carbon-free drivetrains (IEA, 2008; Leinemann, 2011; Mönnig et al., 2018).

Consequently, some drivetrains are more subsidised by the state than others. Especially plug-in electric and PHEVs are subsidised; synthetic fuels and internal FCEVs are less supported, even though companies and politicians acknowledge their effectiveness (BAFA, 2020; BMF, 2020). This means that although the overall goal of reducing carbon emissions through alternative drivetrains is clear, the way to achieve this goal is not sufficiently defined, and thus automotive companies cannot decide on which drivetrain to use to achieve the overall goal of carbon-free transport. In this context, Bakker and Farla (2015, p.1) have stated,

The recent history of innovation in the automotive industry has shown many 'cars of the future', but no apparent winner has emerged yet. Even more so, both car manufacturers

¹ See definition for conventional changes in definition section on page 13

and policy makers have often shifted their attention from the one alternative fuel to the other.

Thus, the main problem regarding electrification as a change is that many outside opinions and strategies influence car manufacturers and hinder them in adopting an appropriate change strategy, which also influences their internal communication regarding electrification. The main reason why outside pressures regarding electrification might hinder automotive companies in this way is that carbon-free drivetrains other than electric engines have been developed and are thus available. However, there seems to be a public consensus and concentration on the implementation of electric engines, which have some technological shortcomings compared to other carbon-free drive solutions².

Considering the characteristics of electrification as a change, it can be stated that electrification is different to conventional internal company changes. Firstly, as stated above, electrification is a change emerging from societal and political demands rather than as a strategic market response by automotive companies. Secondly, automotive companies are not shaping electrification as they could shape any other internal change because they are subject to market regulations and political subsidies for specific drivetrains, especially electric engines (Bratzel & Thömmes, 2018). Not only is the production of electric engines strongly subsidised by politics, but customers in Germany also receive substantial state-sponsored incentives to buy electric vehicles (Sierzchula et al., 2014).

This current situation would, in theory, be manageable for automobile manufacturers, but substantial uncertainties emerge from electrification. While uncertainties often emerge during internal changes in companies, electrification constitutes an immense uncertainty both for people working in the automotive sector and for customers. In this regard, Jarzabkowski et al. stated that a ‘Mandated change, imposed by a powerful external actor, extends understanding of the dynamics of radical change’ (2019, p.1). Moreover, electric vehicles have many technological flaws, and electricity production in Germany mostly relies on coal which hinders the environmental impact of automobiles relying on electricity. The technology of electric cars itself is still inferior to other established technologies, and thus electric cars’ ranges are insufficient and incomparable to those of cars with ICEs, FCEVs or engines powered by

² See Figure 1 in Appendix A of the Appendices for an overview of carbon-free drivetrains.

synthetic fuels. This leads many car manufacturers to the belief that, in the future, electric vehicles will be substituted by better technology, thus making them a temporary solution which is also dividing society and politics (Open-Access-Government, 2020; The-Guardian, 2021). Governments focus their monetary and political support on electric vehicles now, which means that electrification is the only viable solution for automotive companies and consumers. However, this support could shift towards new technologies soon if better technological solutions are established (Sierzchula et al., 2014).

When facing new mobility solutions, the German government does not invest in the required infrastructure to support electric engines, while still demanding that automotive companies apply the required changes to provide an electric fleet. According to projections, all countries in the EU would have to invest up to 1 trillion Euros by 2030 in carbon-free electric drivetrain solutions and the appropriate infrastructure to provide emission-free mobility (Leinemann, 2011). Currently, Germany only subsidizes up to approximately 7000€ per electric vehicle, which is lower compared to the subsidies offered by other states like Norway or Denmark that offer more than 15,000€ per electric vehicle plus tax exemptions (IEA, 2021; McKinsey&Company, 2014)³. Considering Germany's infrastructure, a low number of charging stations is available compared to other countries⁴, which means that full electrification cannot be supported (IEA, 2021; Sierzchula et al., 2014). Germany's electrification infrastructure also does not meet the European Union's Alternative Fuels Infrastructure Directive (AFID), offering a worse electrification infrastructure to its citizens than Thailand and Poland, for example (IEA, 2021, p.40). While top-performing countries like Norway and the Netherlands provide between 20 to 25 charging stations per 100,000 residents, Germany provides just five charging stations per 100,000 residents (Sierzchula et al., 2014) (see full state comparison in Appendix A).

Furthermore, while electrification constitutes an unconventional change because of its pro-environmental and industry-overarching nature, it also constitutes a great threat for many employees working for automotive companies in Germany (Gell & Thran, 2021); unlike other company internal changes, electrification is threatening thousands of jobs in most automotive companies in Germany. The reason why electrification constitutes a threat for so many jobs is

³ See Figure 5 in Appendix A of the Appendices for full comparison of country subsidies for BEVs

⁴ See Figure 6 in Appendix A of the Appendices for full comparison of available charging stations per country

the core component of this change, namely the electric engine. According to Erich and Witteveen (2017), an electric engine, compared to an ICE, has approximately 1200 fewer parts, which means that full electrification would negatively impact the workforce in the German automotive industry. According to estimates, full electrification would lead to an 86% decrease in companies' supply chain demand, which would negatively impact employees in automotive companies and in automotive supplier companies. Under these circumstances, automotive companies would have to react with layoffs to respond to the decrease in product complexity and to the fully automated production process of building electric engines (Casper & Sundin, 2020; Erich & Witteveen, 2017; Mönnig et al., 2018).

1.3 This thesis' purpose in considering electrification in the automotive sector

Since electrification constitutes the most demanding and unprecedented change for the automotive industry, an explorative focus is applied in this thesis using a case study structure in which two automotive supplier companies and one OEM are studied. This thesis seeks to understand how electrification as a pro-environmental change is perceived by people working in automotive companies and how this change is perceived differently compared to more conventional changes. The second focus of this thesis considers change communication regarding electrification, asking the question of how a substantial change like electrification can be communicated to employees working in automotive companies whilst maintaining their motivation and reducing their uncertainty and fear.

Electrification as a change is equally challenging for automotive companies' management and employees, but both groups are impacted differently by this change. The management group, for instance, is required to create a suitable strategy to manage and communicate electrification to their employees. At the same time, the employee group needs to express their requirements to their management in order to create an understanding of what they expect from this change and what they wish their future workplaces in automotive companies will look like. Thus, the employees in automotive companies need to use internal communication channels that can collect and concentrate their opinions and perceptions of electrification to consequently communicate them to their management. The respective work council officials can for instance bundle the opinions of their employees and subsequently communicate them to the management.

Since there is an asymmetry between employee and management perceptions, the applied explorative approach of this thesis uses two perspectives embedding the respective management and employee perceptions regarding electrification within each case study company. However, this thesis still aims to provide a holistic picture of electrification in the automotive sector, so the findings from both groups are cross-compared and triangulated between all companies in order to find similarities and differences in perceptions and applied strategies between companies, manager groups and employee groups.

1.4 Research questions

Having presented an overview of this thesis' purpose and research approach, the main questions and associated sub-questions that this thesis aims to address are as follows,

1. How is electrification as a pro-environmental change perceived by the study participants of the case study companies?
 - a. How and to what extent does the perception of electrification differ between the three case study companies?
 - b. How and to what extent do the employee group and the management group perceive electrification differently within the case study companies?
2. How are conventional changes communicated in German automotive companies?
 - a. How and to what extent does conventional change communication differ between the three case study companies?
 - b. How is conventional change communication perceived by the study participants?
3. How are specific pro-environmental changes related to electrification communicated in German automotive companies?
 - a. How and to what extent does the communication of pro-environmental changes related to electrification differ from conventional change communication?
 - b. How and to what extent does the communication of pro-environmental changes related to electrification differ between the three case study companies?

4. How is change communication regarding electrification and pro-environmental changes perceived among the participants in German automotive companies?
 - a. How and to what extent does the perception regarding the communication of electrification differ between the three case study companies?
 - b. How and to what extent do the employee group and the management group perceive the specific change communication of pro-environmental changes related to electrification differently?

1.5 Structure of this thesis

Following this current chapter, Chapter Two provides a literature review presenting an extensive discussion of academic sources focusing on change management and change communication, as well as reviewing sources regarding pro-environmental changes and pro-environmental behaviour. Moreover, Chapter Two reviews sources of change examples that show similarities to the severe impact electrification currently has on the automotive sector.

Chapter Three provides a full discussion of the underlying methodological standpoints and the applied research philosophy of this thesis. It further presents an overview of this thesis' research design and the methods used for the data collection. This study uses a case study methodology requiring the collection of both primary and secondary data. Lastly, Chapter Three presents a review and a reflection on the data collection process and the applied data analysis approach, as well as a discussion of the ethical considerations to protect study participants.

Chapter Four presents the findings that were made during the data collection process. It primarily focuses on the collected primary data from the interviews by presenting findings with the corresponding interview passages and the underlying data that generated them.

Chapter Five presents a discussion of the findings that were outlined in Chapter Four. The evidence and findings from the interviewing phase are contextualised with corresponding literature to ultimately provide an understanding of how this thesis' findings either support, contradict or complement the established understanding of previous literature.

Chapter Six concludes this thesis by summarising the findings and previous activities described in the individual chapters. Moreover, Chapter Six also provides a closing reflection on the research activities and presents a critical appraisal of the applied research methods and strategies. Lastly, Chapter Six concludes this thesis and presents final suggestions and recommendations for future research projects considering electrification in the German automotive industry.

2. Chapter Two: Literature review

Thus far, Chapter 1 of this thesis has introduced electrification and has shown that the German automotive industry is facing many changes connected to electrification. One question that is considered by this thesis is how German automotive companies will communicate these changes to their employees. Therefore, an understanding of the literature regarding change communication had to be acquired to establish which change communication methods can generally be applied by companies facing change. Consequently, Section 2.1 presents a detailed literature review of previous research regarding conventional change communication processes and communication channels, that can be specifically used when communicating change internally in organisations. While Section 2.1 presents a discussion regarding communication processes and channels, Section 2.2 considers the content of change communication which must be integrated with the change communication process and the applied channels. This section primarily focuses on previous literature regarding the communication of change-related information and sensemaking communication.

Sections 2.3 and 2.4 consider previous literature regarding electrification and its societal impact, as well as its potential opportunities for automotive companies. The consideration of literature regarding the nature and impact of electrification on companies is essential to obtain an understanding of what measures companies might take to communicate a change like electrification. The presented discussion of relevant literature in Sections 2.3 and 2.4 regarding electrification offer an understanding that electrification is a substantial change which means that the conventional change communication processes and methods presented in the literature discussion in Sections 2.1 and 2.2 are limited in their application in relation to the communication of electrification. Subsequently, Sections 2.5 and 2.6 present a detailed review of previous literature regarding the communicative responses to radical changes and

communication methods that are best suited to communicate pro-environmental changes such as electrification.

Since this thesis also considers how the communication of electrification is perceived by the study participants, a discussion of the literature regarding the perceptions of communication approaches that are applied during electrification is presented in Section 2.7. While newly applied changes and their communication can cause uncertainty and distrust, Section 2.8 presents a discussion of previous literature regarding change communication practices that can cause distrust and uncertainty. Section 2.8 also incorporates a literature review regarding managers' perceptions of their own communication practices and concludes the literature review.

Considering the variety and number of studies that were discussed in this chapter, it was essential to adopt a rigorous and consistent approach while collecting, reviewing, and presenting literature for this chapter. Thus, previous studies focusing on systematic and methodological approaches for writing literature reviews were reviewed (Alvesson & Sandberg, 2020; Paul & Criado, 2020; Post et al., 2020; Snyder, 2019). Snyder's (2019) guideline questions for planning and assessing a literature review were used to structure the reviewing process of identifying suitable sources for this work. A detailed outline of the guideline questions provided by Snyder is presented in Figure 7, 8 and Figure 9⁵.

Moreover, previous studies on sampling processes for collecting suitable sources were considered (Littell et al., 2008; Palmatier et al., 2018; Snyder, 2019). Ultimately, a mixture between a systematic and narrative literature review was chosen (Baumeister & Leary, 1997; Littell et al., 2008; Tranfield et al., 2003).

⁵ See Figure 7,8 and 9 in Appendix A of the appendices for the applied guideline questions by Snyder (2019)

2.1 Communication of conventional changes

2.1.1 Overview of internal change communication

Previous research has often considered the question of how changes have to be communicated and what companies and organisations have to do in order to successfully communicate ‘change’ to their employees (Balogun & Hope Hailey, 2008; Bratton & Gold, 2017; Cushman & King, 1995; Klein, 1996; Kotter, 1996). This literature often states that communicating changes requires the communicator to consider various circumstances to provide good change communication to all staff. Previous research states that change communication should, in the best case, happen in face-to-face scenarios and personal settings and should focus on specific communication characteristics. These specific communication characteristics contain the ideas necessary to communicate a shared company vision and the application of communication simplicity (eliminating all ‘jargon’, ‘technobabble’ and ‘MBA-Speak’), the aim of which is to prevent confusion, alienation, and suspicion among employees (Kotter, 1996).

Providing ‘good’ change communication is an important task for companies. Rehman (2011) for instance states that poor change communication will inevitably result in negative emotions for the recipients. Thus, previous research concluded that change communication should ideally happen in a face-to-face setting between managers and employees and should have a motivational character (Jensen et al., 2018; Kotter, 1996; Men et al., 2021). Previous research has thus stated that it is imperative to conduct change communication in a way that allows managers to include all employees in the change communication process and fully communicate all important information (Brown & Humphreys, 2003; Khan et al., 2016; Robbins et al., 2013). Bratton and Gold (2017) state that it is crucial that all messages appeal to employees or seem relevant, so targeting employees directly with personal, relevant information, good or bad, appears to be an appropriate strategy to avoid filtering or leaving out information that could be deemed important. By contrast Nixon (2014) found that participants not only require relevant messages but they also long for thorough change communication and the need to understand why discrepancies are present in the change processes.

This study will focus on the communication of electrification as a pro-environmental change; thus, the general principles of internal change communication in the automotive companies are

important to consider. Hence, an understanding of how the automotive companies' communication of electrification differs from conventional change communication can be obtained.

2.1.2 Process-driven change approaches for internal changes

According to the change communication literature many companies apply change processes that help them structure internal change. For instance, Kotter's (1996) perception of conventional change communication was formulated with an understanding of process-oriented change research and therefore tries to describe change communication that can be fitted into a strategy process. However, as the behavioural approach to change management has indicated (Chreim, 2006; Nixon, 2014; Okumus & Hemmington, 1998), employees have a variety of perceptions and responses, so it might be difficult for a company to plan a change venture as a structured process. Since there are many different forms of change, such as incremental or continuous change, it has been stated that every type of change requires a special form of communication. The presented change communication processes below were initially designed to be applicable in various change situations and settings. The literature suggests that the following processes are key,

1. Identify the company's need for change (Galpin, 1996; Kanter et al., 1992; Luecke, 2003)
2. Develop or create a shared vision and direction/strategy (Galpin, 1996; Kanter et al., 1992; Kotter, 1996; Luecke, 2003)
3. Create a sense of urgency among the employees (Galpin, 1996; Kanter et al., 1992; Kotter, 1996)
4. Identify leaders or support strong leadership (Kanter et al., 1992; Luecke, 2003)
5. Create a guiding coalition or political sponsorship (Kanter et al., 1992; Kotter, 1996)
6. Create enabling structures or a broad-based action (Kanter et al., 1992; Kotter, 1996)
7. Communicate the change vision and involve employees (Kanter et al., 1992; Kotter, 1996)
8. Reinforce, institutionalise, or anchor change in the company's structures (Galpin, 1996; Kanter et al., 1992; Kotter, 1996; Luecke, 2003)

The above presented change strategies were designed to be applied to any change and are thus standardised. Applying standardised strategies for change makes sense since it can be expected that companies are rationale entities composed of rational individuals, thus, a standardised procedure can create universal guidelines (Valeri, 2021). Consequently, much previous research has created standardised, process-bound change strategies as frameworks for companies that allow them to orientate their own change processes to the ones established in the literature. However, change processes as they are presented above in this chapter are only guidelines and need to be tailored to the individual situation of the change and the company, thus showing the disruptive character of change and the potential limitations of static models of change (Ifenthaler, 2020; Nelson, 2003).

This thesis focuses on internal change communication in automotive companies facing the transition towards electrification. Thus, the question is raised whether change communication in automotive companies is process-driven or whether organisations apply a more fluid approach to communicate changes internally. Following the understanding derived from prominent change examples, communication is mostly considered as a means to overcome fear and uncertainty by providing a narrative of a common company mission to the recipients (Morrison, 1993; Richardson & Denton, 1996). Two change examples that are often mentioned in the literature are the internal changes at Chrysler and Delta in the 1990s, which demonstrate that an internal process-driven communication approach has the potential to ease employees' uncertainty and fear regarding internal changes and how these changes might impact their way of working (Delta Air Lines, 1994; Richardson & Denton, 1996). Chrysler applied a process-driven communication approach that repeatedly reminded the employees of the company's mission (Richardson & Denton, 1996), Delta used precisely defined change communication steps that had the objective of systematically decreasing fear and uncertainty among their employees (Delta Air Lines, 1994).

In the first step, Delta held a kick-off event in Atlanta that was focused on announcing the internal change and the facts related to the internal restructuring that would be caused by the change. In this regard, Delta announced that many employees might lose their jobs. Following this announcement, Delta offered a telephone service that employees worldwide could use to find out whether their position would be affected (Delta Air Lines, 1994). Therefore, Delta is an early change example that shows that internal change communication can also be process-

driven, and thus different communication tools and channels can be applied at different points during a change.

Klein (1996) presented a detailed overview of how internal change communication processes can help organisations to better convey change messages to their employees. In his study, Klein also showed how change communication is ultimately bound to certain communication principles and communication channels, such as multimedia communication, excessive communication and communication that is personally relevant for recipients. These processes and approaches allow companies to gain an understanding of which communication process is most suitable for their internal change venture. Klein (1996) has outlined change communication processes, considering every communication step and the respective channels and communication approaches which can help companies to shape their change communication⁶.

Furthermore, previous research has presented evidence that internal communication processes enable organisations to gain control over their employees and the change process. Cram et al. (2016) found that applying internal communication or information systems which aim to establish control over the communication content enable companies to adapt more quickly to change. Communication processes in companies are also necessary because most companies must follow business processes in order to uphold rules and compliance. Internal changes can therefore be challenging for organisations, as their mostly process-driven daily business needs to continue, even when undergoing internal change. Ifenthaler (2020) states that internal processes during changes can be maintained, and challenges can be overcome when open and transparent communication structures are implemented in the designed processes. Business processes and predefined procedures like production or supply chain processes are necessary for companies to conduct their daily business (Valeri, 2021). In this regard, Fdhila et al. (2015) found that compliance with internal processes directly impacts how effective an organisation works and how employees can conduct their business. Therefore, it can be concluded that large modern organisations rarely have unstructured internal business conduct and communication procedures. This is in line with the literature postulating that change communication should also be included in business processes (Barrett, 2002; Kotter, 1996, 2008).

⁶ See Figure 3 in Appendix A of the Appendices for Klein's (1996) detailed change communication process

Even though organisations use internal change processes and therefore also change communication processes, previous research still discusses why over 50% of all change initiatives fail (Hughes, 2011; Kotter, 1996; Varney, 2017). This raises the question of whether a less process-driven approach to change should be applied by organisations which, in turn, implies that the behavioural aspect of change should be considered more often (Hagger et al., 2020), or that change leadership and actual change communication processes should be revisited (Jones & Harvey, 2017; Varney, 2017).

2.1.3 Applied communication channels during conventional change communication

Independent of the companies' processes, they have to convey messages to their employees, and therefore a medium or channel is required to realise the transmission of information. Many companies still apply a top-down communication approach during changes to transport information equally and swiftly through their organisation (Baker, 2007; Bel et al., 2018; DiFonzo & Bordia, 1998; Klein, 1999; Kotter, 2008). However, when considering the wide range of communication channels, the question arises, which communication channels are used to communicate changes most effectively?

(Klein, 1996) and Kotter (1996), for instance, strongly emphasise that face-to-face communication is the most viable form for conveying change messages during times of change. However, many communication channels have emerged since the 1990s and therefore more communication channels are available today. There are increased possibilities provided by social media, telecommunications, and other information communication technologies (ICTs). Men (2014) has examined communication channels used to inform employees about new decisions, policies, events, and changes, finding the most-used channels to be email (71.9%), employee meetings (58.7%) and print media⁷ (38.1%). White et al. (2010) has noted that other channels commonly used are face-to-face communication with immediate managers (33.6%), internal websites (32.6%), digital channels (6.7%) and internal social media (0.5%) (2010). By contrast, employees mostly preferred receiving information via email (73.4%), employee meetings (66.7%), interpersonal face-to-face communication (45%), print media (38.3%) and internal websites (31.8%) (Men, 2014). Furthermore, employees positively perceive

⁷ Print Media in this case was specified as: memoranda, brochures, newsletters, reports, policy manuals and posters.

symmetrical communication (top-down and bottom-up), because, contrary to asymmetrical communication (top-down), the symmetrical approach to internal communication allows employees to raise their concerns, which directly impacts their satisfaction with workplace communication (Men, 2014, 2015; White et al., 2010). Men (2015) has found that internal social media communication offers the recipients a feeling of dialogical communication as opposed to communication via email, for instance. Men (2015) further states, due to the dialogical characteristics of communication channels like social media and face-to-face communication, employees have a higher satisfaction with such communication content than with monological communication channels like presentations, for instance. The inclusion of the CEO as a public figure in the communication channels has been found to yield high trustworthiness among the recipients, even though CEOs often do not have the time to engage in dialogical communication with everyone in their companies (Men & Tsai, 2016). Using the CEO or other leaders as communication channels had been found to raise satisfaction and trust among recipients since leaders as communication channels are perceived as transformational leaders who are pulling on the same string as employees when it comes to change (Malik et al., 2017; Men & Tsai, 2016).

Schulz-Knappe et al. (2019) also emphasize that open and dialogic communication channels have the potential to persuade employees sceptical of the company's change venture and the respective advantages of the change. While some literature emphasises the advantages of dialogical communication it is often stated that the full range of internal company communication channels should be used to effectively communicate internal change (Tourish & Hargie, 2009). In this regard, companies should not only use a variety of communication channels to communicate changes, but also diversify the communication content when addressing different departments (Barrett, 2002; Husain, 2013; Johansson & Heide, 2008).

Based on the diversity of applied communication content and communication channels, the question arises, whether there is a 'textbook' approach or whether change communication is a reactive task that is dependent on inside and outside factors such as severity of the change, size of the company, percentage of manual workers etc. In this regard, previous research has concluded that using many different forums and communication channels, including big meetings, small meetings, memos and newspapers, emails and formal and informal interaction among employees and managers, can be effective (Kotter, 1996). Applying many different channels helps to clear up unanswered questions among employees since one channel can

answer some questions and another channel can answer other questions of a different employee group (Kotter, 1996). Kotter's conclusion is echoed by Klein, who states that 'Message redundancy is related to message retention' (Klein, 1996, p.34). Studies by Klein (1996) and Bratton and Gold (2017) stress that open communication must be practised using many different channels and media to communicate messages effectively to receivers. Furthermore, as mentioned above, the idea of change and the new measures have to be repeated over and over again in order to become successful (Bratton & Gold, 2017; Klein, 1996; Kotter, 1996; Young & Post, 1994)

In conclusion it can be stated that the above presented literature strongly distinguished monologic from dialogic change communication channels. Therefore, the following sections will further consult the literature on these distinct groups of communication channels.

2.1.4 Monologic and Dialogic change communication

Section 2.1.3 introduced the term 'dialogic change communication', which is a type of communication that uses communication channels that allow for dialogue or exchange between communicators and recipients. Moreover, the literature cited above regarding change communication showed that many studies recommend applying a mixture of channels. Thus, companies most likely use both monologic and dialogical channels during change communication.

Monologic communication channels are all communication channels that do not allow for an exchange between communicator and recipient, such as newsletters, no-reply information emails, posters and monologic speech in the style of an academic lecture (Zare & Tavakoli, 2017). While the nature of these monologic communication channels is easy to understand since they simply do not allow for an exchange, the nature of dialogic communication channels is more complicated. Companies often use dialogic communication channels to communicate to their employees and members of the public, such as customers or stakeholders, in order to represent an active presence or responsiveness (Capriotti et al., 2021). Previous research states explicitly that the application of dialogic communication during changes is imperative for the change venture to succeed (Fadzil et al., 2019; Simoes & Esposito, 2014). Furthermore, dialogic communication, especially in Corporate Social Responsibility (CSR) settings and during

change, can lead to desirable employee involvement, enhancing their understanding and satisfaction towards change (Glavas & Kelley, 2014; Song & Tao, 2022).

Research on dialogic communication often focuses on companies' communication practices in fostering public relations (PR) (Kent & Lane, 2017; Kent & Taylor, 2002). However, understanding how dialogic communication can involve recipients during times of change is not negligible since dialogic communication does not need face-to-face settings to work, as it can also be applied in online settings, thus saving time (Wu, 2018). Nonetheless, other research has shown that, in general, change communication recipients are missing dialogic communication for the most part during internal changes and emphasise that activity of dialogue would enhance their understanding of a change venture (Nixon, 2014).

Based on the literature presented in Sections 2.1.3 and 2.1.4, the question emerges whether the participating automotive companies use a mixture of monologic and dialogic communication channels when communicating changes and how electrification might change the internal application of communication channels.

2.2 Change communication content

This literature review has so far focused on the communication channels used when corporations communicate conventional changes and whether they use established communication processes or improvise their internal change communication. This current section focuses on communication content when communicating changes internally.

2.2.1 Information communication

One key element regarding the content of change communication that is found in the literature is the internal provision of information or information communication which specifically aims to overcome employee resistance and uncertainty (Allen et al., 2007; Armenakis & Harris, 2002; Daft & Lengel, 1986). Furthermore, internal information communication, when executed correctly, is related to employee wellbeing and satisfaction, so information communication paired with the right change communication channels constitutes a powerful tool to communicate changes internally (Jimmieson et al., 2004).

Previous research has found that changing organisations need to communicate information often and precisely in order for the change recipients to understand the reason why the organisation has to change. Pearson and Thomas (1997) for instance have established the understanding that internal information, although fundamental for corporations when communicating changes, has different characteristics. Therefore, a differentiation can be made between Must-Know (job- and change-specific information), Should-Know (desirable information about possible changes in higher management) and Could-Know information (information acquired unofficially from colleagues) (Pearson & Thomas, 1997). In the case of change management, Must-Know and Should-Know information are important to communicate, in order to facilitate the change most effectively and therefore reduce employees' uncertainty and fear. Based on the information characteristics, previous research has stated that managers and communicators need to know which type of information should be communicated first to employees, and therefore managers should create information communication priorities (Goodman & Truss, 2004; Kitchen & Daly, 2002).

Moreover, the quality of the information plays a role in some cases, affecting the change recipients' level of understanding of the internal change. The quality of change information has especially been found to be contained in the accuracy, timeliness, and usefulness of the information about the change (Allen et al., 2007). It has been stated above that the quality of the conveyed message sometimes plays a lesser role during change communication if the communication is clear. Allen et al. (2007), however, showed that the quality of the conveyed information has a direct impact on how the recipients perceive information communication. While previous research has often not directly specified what poor-quality content communication is, Allen et al. (2007) have provided an understanding of how poor information communication is specifically perceived by recipients. They concluded that information which is perceived to be of poor quality by employees is information that is not job-relevant and consequently leads to employee uncertainty regarding the change venture. While information communication can be an effective approach to overcome fear and uncertainty during times of change, Bel et al. (2018), for instance, state that the effectiveness of information communication is bound to company-specific characteristics, the main characteristics being the company's size, the attributes of its managers, and the number of actors involved in the planning and execution of the change process. By contrast, Nisar et al. (2019) for instance state that information communication using social media channels can increase the level of accessible knowledge in companies and is thus independent of the proposed characteristics from Bel et al. (2018).

However, when social media channels are not used, Allen et al. (2007) state that the provision of high-quality, job-relevant information affects and lowers the respective employee uncertainty towards change. Bel et al. (2018) find that a simple yet effective approach to communicate information lies in the concentration of resources in smaller teams who communicate information in order to provide highly effective communication structures that are especially found in start-ups, for example. The challenge for information communication is that big companies execute information communication within their large structures and might therefore be limited in conveying pressing messages compared to smaller corporations. This challenge can be overcome by big companies when using a face-to-face and more personal communication (Bel et al., 2018) or pre-defined processes to communicate information (Klein, 1996; Kotter, 1996; Men, 2015; Schulz-Knappe et al., 2019).

Information content and information channels go hand in hand and are therefore impossible to separate when communicating changes. Especially when communicating internal information during times of change, companies must be mindful that the perception of information can also be bound to the perception of the channel. In this regard, White et al. (2010) state that information provided by high-level leaders is perceived positively if employees have a direct relationship with these leaders. Based on this, they conclude that employees have a higher sense of responsibility to advocate information within the company if they have a bond with the leader. Under these circumstances, CEO information communication has been found to be especially effective, and White et al. (2010) acknowledge that information can be communicated very effectively using email. Their study nevertheless finds that employees usually prefer to receive information communication via face-to-face communication or other interpersonal interactions.

The literature further suggests that corporations can always apply a checking mechanism to assess whether their information communication is perceived positively or negatively. In this regard, DiFonzo and Bordia (1998) state that effective information communication is directly measurable by considering respective employee behaviour during change. If employees resist changes, have reduced levels of trust, high levels of anxiety and spread rumours, companies can be certain that their own communication is concealing information. DiFonzo and Bordia (1998) further explain that certain manager behaviour can be observed when employees perceive information communication negatively; in these circumstances managers have been found to say 'no-comment' when information is requested, maintain a closed change planning

process, and have discrepancies between their internal information communication and external information communication, for example, when communicating to the media.

The question that arises for this research is whether the three companies communicate information in face-to-face settings or through other channels that are also effective and thus satisfy and motivate employees? Moreover, this thesis aims to understand how information communication is used during times of change by the management and what employees require from change information communication to be satisfied.

2.2.2 Sensemaking communication

Section 2.2.1 above has shown that information communication aims to overcome uncertainty and fear by providing specific change-related information to recipients in order for them to understand why the internal change is happening. However, in some cases information communication was found not to be sufficient for the recipients to understand why their organisation had to change. Therefore, researchers like Weick (1979), who was a pioneer in the field of sensemaking, described sensemaking communication as an approach which aims to explain the sense behind major events in companies, like change initiatives, and why it is important for the company and all its staff to change. During times of change, companies were found to use sensemaking as a strategy to create a narrative and a discourse between management and employees to resolve uncertainty and resistance (Lüscher & Lewis, 2008; Van Vuuren & Elving, 2008; Weick, 1995).

Brown et al. (2015) explain that it is difficult to find a precise definition for sensemaking communication in companies. Sensemaking, which has different focuses and goals when applied internally, is often seen as an approach which '[...] refers generally to those processes by which people seek plausibly to understand ambiguous, equivocal, or confusing issues or events' (p.266). This definition is especially suitable for changes when considering the ambiguity of change which often provokes fear and uncertainty among change recipients. Building on the understanding that change often impacts an organisation, Ahmadi et al. (2018, p.101) offer an explanation claiming that corporations themselves highly rely on sensemaking, since they are described as sensemaking units in which managers and employees must interpret current events and transfer their past knowledge to present situations,

Sense-making is the process by which the organization gains, interprets, and acts on its own environment. An effective strategic plan needs to understand the forces shaping the situation, by engaging in collective effort and the ability to interpret events. Organizations are seen as sensemaking units within which the managers and employees interpret the events and their mental models, and their past experiences can influence the way the program is interpreted (sense-making) and transfer of their understanding to others (sense-giving).

Change recipients were often found to emphasise the importance of understanding why changes are proposed in their companies (Nixon, 2014). Therefore, when faced with changes, organisations must make sense of their external and internal environments and also need to swiftly learn about their current situation. Thus, sensemaking helps them to strategically respond to changing work environments (Asik-Dizdar & Esen, 2016). While sensemaking as a concept aims to offer an understanding of the organisation's internal and external environment, sensemaking communication can be understood as a learning approach which helps the recipients of sensemaking communication to reduce equivocality through a mixture of thinking and acting. Thus, the recipients will engage in a learning process which helps them to consequently make sense of the changing work environment (Colville et al., 2016). Kudesia for instance stressed the fact that sensemaking as a collective learning approach is a way that '[...] people come to think together, forming higher order patterns of interpretation and action that are fundamentally irreducible down to any one individual' (2017, p.4). This means that creating a change communication approach that conveys the message of 'why' the change is happening must ultimately be conveyed in a way where the collective and the individual share a similar interpretation of the change communication. The literature also suggests that during changes, employees need to be involved in the change communication process (Schulz-Knappe et al., 2019). Thus, sensemaking could provide an increased employee involvement through enhanced trust in the management and the change venture (Lüscher & Lewis, 2008).

When considering sensemaking in the context of organisational communication, Sandberg and Tsoukas (2015) present an overview of the circumstances in which sensemaking happens in organisations. In their understanding, sensemaking communication is mostly triggered by major or minor internal events that are either planned before or emerge sporadically. Internal organisational changes suit the characteristics of this description, which means that changes require further sensemaking facilitation during their communication. Sandberg and Tsoukas

(2015) presented the idea that sensemaking is a process which consists of the creation, interpretation, and enactment of events, which ultimately results in the (non-)restored sense or action of the recipients⁸.

Furthermore, sensemaking was found to be reliant on other factors that could influence its effectiveness such as context, language, emotion, politics etc. (Sandberg & Tsoukas, 2015, 2020). Like other communication methods, sensemaking is context-bound which means that outside factors, including change perception and perceptions of systemic and episodic power, directly influence the effectiveness of this communication approach (Sandberg & Tsoukas, 2020; Schildt et al., 2020). However, consideration of the literature does not clarify the questions of when companies apply sensemaking communication and how sensemaking communication differs from information communication. Therefore, this thesis shall consider the conventional change communication processes of the three case study sites, and whether companies use information communication and sensemaking communication as separate concepts in different situations or use the two concepts interchangeably during conventional change communication processes as well as for the communication of electrification.

2.2.3 Conclusion on the literature on conventional change communication

Sections 2.1 and 2.2 have presented previous research on company internal change communication. To conclude this section of the literature review, it can be stated that previous research has emphasised the creation of change communication processes and suitable communication channels to communicate changes in organisations.

The extant literature has especially outlined the importance of employee involvement during changes and the use of dialogic change communication channels, which can also facilitate an exchange with recipients of change messages. Moreover, it became apparent that previous research emphasised establishing a structured change process that defines essential managerial and communicative tasks for companies. Previous studies on change communication also stressed that sufficient communication of information and the underlying sense of changes are imperative for changes to succeed.

⁸ See Figure 4 in Appendix A of the Appendices considering major constituents of sensemaking (Sandberg & Tsoukas, 2015)

It was essential for this thesis to consider previous literature on change communication to understand how the communication of electrification might differ from the communication of conventional changes. Thus, this thesis will consider whether the automotive companies also apply process-driven change strategies, which include well-established communication channels that allow for information and sensemaking communication and the involvement of employees in the change process.

2.3 Societal aspects of electrification influencing automotive companies

Chapter One introduced electrification and has shown that electrification as a pro-environmental change differs strongly from conventional change initiatives. Sections 1.2 and 1.3 have offered an overview as to why electrification is perceived as an uncertainty and why this change can also be perceived negatively based on its technological flaws and the missing infrastructure which currently cannot accommodate many electric vehicles. However, as stated earlier, external pressure is exercised on automotive companies in order for them to act more pro-environmentally. Outside pressures on companies are no novelty and governing bodies have urged companies before to adopt responsible behaviour (Contrafatto et al., 2019). However, many societal movements in Germany and Europe have emerged that are fighting against rising CO₂ emissions and the ongoing pollution caused by companies.

The literature supports this phenomenon by stating that pro-active support of environmental issues like climate change is provoked through an emotional connection which consequently triggers reactions in people who care about the environment (Salama & Aboukoura, 2018). However, strong emotional connections are only present in people who are invested in environmental questions. Most people perceive environmental issues as abstract representations of consequences that lay in the distant future and, therefore, are emotionally detached from these issues (Weber, 2006). Based on these varying societal attitudes towards pro-environmental behaviour and pro-environmental actions, the following section reviews positive aspects of electrification and positive societal perceptions that might influence companies to change and adopt new products.

2.3.1 Positive impacts of electrification

Companies reflect society, and employees are a diverse group of people with different opinions and attitudes. While society and politics exercise pressure on automotive companies to become 'greener', it must be expected that certain employees share similar ideas and perceptions.

Not all automotive companies reject electrification and pro-environmental changes; some actively research possibilities to modernise drivetrain systems and make them more environmentally friendly (Bratzel & Thömmes, 2018). In this context, the question arises, whether automotive companies that intrinsically focus on green mobility attract more people from society who share pro-environmental thoughts and thus perceive electrification more positively. Furthermore, it has to be asked whether these companies also have 'green corporate cultures', or at least corporate cultures that can facilitate more radical transitions. Therefore, the following section shall outline the literature focusing on the relationship between green corporate cultures and consequent positive employee perceptions of electrification.

2.3.2 Positive societal perceptions of electrification and green corporate cultures

This section shall consider how green corporate cultures and positive societal perceptions of electrification engage in reciprocity that supports environmentally friendly changes like electrification. The literature shows a clear link between corporate cultures which facilitate technological innovation and new changes and the respective change acceptance of employees and other recipients (Alas & Vadi, 2006; Armenakis & Bedeian, 1999; Armenakis et al., 2007; Dillon & Fischer, 1992; Dyck et al., 2019; Islam et al., 2019; Kenny & Reedy, 2006; Liao, 2018; Twati & Gammack, 2006).

Pro-environmental actions taken by companies can enhance their public reputation, thereby increasing their attractiveness as employers. Modern and young employees place high demands on their employers when it comes to pro-environmental performance (Dögl & Holtbrügge, 2014; Heilmann et al., 2013; Jones et al., 2014; Mikołajczewska & Friedberg, 2018). Considering employees' demands regarding their employers' pro-environmental performance, it can be stated that electrification as a pro-environmental change can enhance automotive companies' reputations as environmentally friendly employers, if the change is incorporated in

the companies' cultures and internal structures and is then subsequently communicated externally (Welch, 2012; Welch & Jackson, 2007).

Therefore, incorporating electrification as a pro-environmental change in the companies' structures is inevitable for them to present themselves authentically as pro-environmental employers to the outside world. In this regard, Alas and Vadi (2006) have shown that organisational cultures have the potential to either block organisational learning and thus hinder change acceptance or facilitate change acceptance through openness to learning and embracing new challenges. However, Alas and Vadi (2006) have not considered the possibility of potential reciprocity between the current employees' pre-collected sets of attitudes and their impact on organisational culture or vice versa. Considering the findings of Kenny and Reedy (2006), it can be stated that around one-third of employees in companies do not know their respective companies' mission statements, and not all employees are familiar with the innovation strategies of their companies. This could lead to a reduced engagement between employees and their management and could cause reduced reciprocity and thus hinder organisational learning and the adoption of pro-environmental cultures (Alas & Vadi, 2006).

This thesis will explore whether the case study companies attempt to incorporate pro-environmental aspects of electrification in their corporate culture to be attractive employers and, thus, authentically communicate their change ventures to the outside world. In addition, this thesis explores how the current employees perceive electrification and whether they are willing to engage in internal pro-environmental culture changes.

2.3.3 Institutional pressure on automotive companies resulting from employees' positive perceptions of electrification

Since employees are members of society, it can be expected that employees who are invested in pro-environmental changes require their employer to support electrification and thus exercise pressure on management. This expectation is supported by Lämsiluoto and Järvenpää (2008), who have found that, over the years, green pressures on organisations have shifted from external to internal pressures, which shows the degree of investment in pro-environmental causes by some employees.

In change scenarios, usually, the management can willingly or unwillingly exercise institutional pressure, which is mainly directed at specific employee groups who might not be willing to change (Wang et al., 2018; Wang et al., 2019). However, considering electrification, Delmas and Toffel (2005) have found that when it comes to exercising pressure on companies to adapt to environmentally friendly practices, stakeholders and internal actors play a prominent role, thus impacting the company's strategic decisions. In their study, Delmas and Toffel (2005) have found that the above-mentioned stakeholders can exercise immense institutional pressure on an organisation, forcing its management to adopt environmentally friendly practices. Similar institutional pressure could potentially be expected to be present in automotive companies whose employees support pro-environmental ideas including electrification. This assumption can be supported by the understanding that company internal pressures regarding environmental actions can lead to managements' adoption of pro-environmental practices (Wang et al., 2018; Wang et al., 2019).

In the case of pro-environmental changes and institutional pressure, the section above shows that outside stakeholders and employees exercise pressure on organisations. This thesis goes further and aims to understand how the study participants perceive outside pressures regarding electrification and whether employees apply internal institutional pressure targeting electrification in automotive companies. Not all companies adopt pro-environmental practices only because of internal or external pressures. Many factors play a role when companies engage in pro-environmental management practices, such as economic opportunities, legislation and ethical motives (Bansal & Roth, 2000). Considering the driving factors presented in the literature that can influence companies to adopt pro-environmental changes, it becomes clear that, beyond external and internal pressures, economic and technological motivations also must be considered. Since this section has covered the ethical motives regarding pro-environmental changes, and the sections on electrification have covered outside pressures such as political demands, the last point, namely, economic, and technological opportunities, shall be discussed in the next section.

2.4 Chances and opportunities resulting from electrification

Changes often offer both threats and opportunities; this is also the case when considering electrification as a change in the automotive sector. As stated before, the automotive industry

has to change in order to reduce pollutants and meet political and societal demands. However, electrification as a new opportunity for the automotive sector offers the chance to enter new markets by taking advantage of new technologies which can have a motivational effect on employees.

2.4.1 Electrification and new technologies as a source of motivation

Yang et al. (2011) and Leinemann (2011) state that carbon emissions will have to be lowered by approximately 80% by the year 2050 compared to the year 1990 within the automotive industry if it is to comply with national and international requirements. As much as these numbers can be understood as an outside pressure or a threat, they could also be seen as an opportunity for automotive companies to invest in new technologies and enter new markets by offering emission-free drivetrains.

The literature states that there is a clear link between companies' technological innovation and enhancement of staff motivation (Akhmetshin et al., 2018; Block et al., 2013; Grosheva & Naumkin, 2013). However, motivation can never emerge from only one source but rather has to be understood as a mechanism that requires an innovative business environment (Akhmetshin et al., 2018). This means that innovative products alone will not suffice to foster motivation during electrification, and instead companies should also focus on adequate payment and a working climate that allows employees to motivate themselves. Using an innovation or innovative technology as a means to motivate all staff requires companies to understand that there is a reciprocity between innovation as motivation and the motivation to be innovative (Grosheva & Naumkin, 2013).

Motivating employees regarding innovation and technologies, as proposed by Akhmetshin et al. (2018), can be a difficult task, as it has been found to be closely linked to internal knowledge management regarding innovation (Block et al., 2013). Block et al. (2013) have found that technological innovation in companies can only function to motivate employees if the knowledge about these innovations 'spills over' to an aggregated stock of knowledge within the organisation. This is a task which is inevitably linked to internal communication containing information about innovation. However, in the case of electrification, this could prove to be difficult since managers and employees already have a broad knowledge about new innovative and emission-free drivetrains, drawn from information presented by the media. Furthermore,

electrified drivetrains are not considered innovative. In fact, effective electric engines were produced as early as the 1870s and saw a fast rise in popularity until the ICE overtook electric engines in the second half of the 20th century (Guarnieri, 2012).

While managers and employees might not consider the technological aspect of electrified drivetrains as a motivational factor for active participation in electrification, the pro-environmental aspect of new drivetrains could potentially allow managers and employees to be motivated by the change. The literature above suggests that innovation and technology can positively impact staff motivation and thus encourage participation. However, when considering the pro-environmental aspects of innovation and economic performance, studies suggest that both are closely linked to the implementation of efficient pro-environmental measures (Danso et al., 2019; Lisi, 2015; Passeti & Tenucci, 2016). This means that pro-environmental actions in companies can enhance motivation and economic performance when they are made transparent and understandable for all staff (Lisi, 2015; Passeti & Tenucci, 2016). These findings from the literature can be applied to electrification, where carbon-free drivetrains as pro-environmental measures are the main factor for companies' economic performance. If the relationship between ecological and economic performance is positive, it can be expected that all staff will be motivated for further ecological changes. Based on the literature presented above, the questions for this thesis arise, whether the technological innovation behind electrification constitutes a motivational factor for the participants, and whether the pro-environmental nature of the new electrified drivetrains has a motivational impact on the automotive companies' staff.

2.5 Communicative responses to radical changes

The first sections of this literature review have considered often-discussed change communication practices which are textbook examples of how changes should be communicated in companies. However, this thesis will differentiate between conventional change communication and the internal change communication of electrification. The literature has shown that electrification as a pro-environmental change has a disruptive character since it has emerged from outside of the companies through political and societal pressures and has thus caused an identity crisis in automotive companies. Moreover, electrification qualifies as a crisis for the automotive companies when considering the definition of Kovoov-Misra (2019),

which states that the main characteristics of crisis in corporations are threat, urgency, ambiguity, stress and emotions, and opportunity for gain. All aspects of this definition can be attributed to electrification. Therefore, this literature review will discuss previous research focusing on similar dynamics, where companies adapted their communication strategies to changes that had substantial impacts on them or showed similar aspects to a crisis.

2.5.1 Company external communication regarding electrification

Communication regarding electrification partly happens outside of companies' structures. This 'outside communication' is expected to happen over several media channels where the communicators are members of the government and societal interest groups, who might communicate new demands and expectations towards the automotive industry externally, as well as the companies themselves.

Previous research has found that outside communication, which is undertaken by companies themselves, is often developed as a crisis communication or PR communication. It has also been found that it is mostly undertaken via social media channels where companies apply less control mechanisms to their communication and thus do not always follow pre-defined communication processes (Lin et al., 2016; Macnamara & Zerfass, 2012). Often improvised, this outside communication via social media channels does allow companies to engage in information communication and discussions with their followers on company-owned social media platforms, which could result in positive exchanges with their stakeholders during crisis management. Previous research regarding external or outside communication has focused on the external communication practices regarding consumer satisfaction, company performance, Corporate Social Responsibility (CSR) and crisis communication (Deverell, 2021; Men & Stacks, 2014; Reilly & Larya, 2018; Tushman & Katz, 1980; Zeithaml et al., 1988).

However, when considering electrification and its possible outside communication, the impact of media communication and social media on companies' decision making has to be considered in order for this thesis to understand how outside communication regarding electrification might pressure or support internal change initiatives and staff perceptions (Deverell, 2021; Reilly & Larya, 2018). Desai (2014) for instance has found that external media coverage influences firms' decision making regarding their internal resource allocation. Moreover, external coverage about competing corporations can sometimes even be more influential regarding

decision making and resource allocation than the coverage of the firm (Desai, 2014). To further specify the impact that external media coverage has on internal decision making and resource allocation, Ocasio (1997) has distinguished between organisational issues (notable events) and organisational answers (choices and actions taken to cope with challenges). In the case of electrification, notable events are constituted by electrification as a change and organisational answers can be understood as the strategies applied to cope with electrification. Furthermore, the literature suggests that external communication of information directly impacts organisations' choices regarding their innovation management and the streamlining of their innovation activities (Schwab, 2007), as well as the fact that organisations are directly impacted by external communication regarding their choices when handling internal resources or acquisitions (Haunschild & Beckman, 1998).

When translating this understanding from the literature to electrification, the question for this thesis arises, whether external media communication regarding electrification has an impact on the companies' decision making during the electrification change process. Furthermore, this thesis will aim to understand how participants from the three companies perceive the influences of external media communication regarding electrification and to what extent the companies engage in external communication regarding electrification and how this specific communication can impact perceptions of this pro-environmental change.

2.5.2 Employee involvement in companies' electrification communication

Automotive companies may be experiencing external communication regarding electrification but are also required to internally communicate all changes regarding electrification. One aspect of internal change communication often discussed in the literature, when companies deal with difficult change scenarios like electrification, is the involvement of employees in internal change and its communication (Brown & Cregan, 2008; Hussain et al., 2018; Morgan & Zeffane, 2003; Schulz-Knappe et al., 2019; Sharif & Scandura, 2014; Sims & Sims, 2002; Stouten et al., 2018).

This literature review has shown so far that electrification has the potential to provoke negative perceptions among managers and employees in the automotive sector. There are several reasons for this. For example, it is evident that perceived outside pressure on companies through public and political influences can provoke negative perceptions among all staff, since outside

influences are often linked to perceived loss of control among organisational members. Furthermore, as shown in Chapter One scepticism towards electrification could emerge through obvious technological flaws in new drivetrain and infrastructure technology. Based on these circumstances, the questions arise, whether scepticism and uncertainty can emerge from electrification and how companies can deal with them.

Brown and Cregan (2008), for instance, have shown that organisational change cynicism (OCC) can emerge from feelings of uncertainty, unfairness, and a lack of information. These attributes could potentially be found in changing work environments affected by electrification and therefore need to be addressed by management to reduce OCC. Brown and Cregan (2008) as well as Nixon (2014) also propose that management, in order to be able to overcome their employees' OCC, should adopt a participatory management style which includes sharing relevant information (information communication) and involving employees in decision making. This is supported by Stouten et al. (2018) who add that employee involvement for changes can also be achieved by using social media channels for modern changes.

Previous studies have often stated that uncertainties can be overcome by giving a sense of control to employees who might resist changes. The literature also suggests that management and leaders must be as transparent as possible when engaging in similarly transparent discussions, involving employees in meetings where staff can state their concerns and opinions (Hussain et al., 2018; Morgan & Zeffane, 2003). Engaging in discourse between managers and employees during times of change can be beneficial and give employees a sense of control (Nixon, 2014). While this might resolve uncertainty, Sharif and Scandura (2014) for instance propose that organisations need to apply ethical leadership during times of change, which means that management should not only engage in discourse with employees and ask for opinions, but actively involve all employees by asking for their direct consultation to resolve change-related problems. When adopting this type of ethical leadership during times of change, employees' job satisfaction and performance will be increased (Sharif & Scandura, 2014). This approach can also be found in other research, where it is proposed that during times of change organisations have to become high involvement organisations (HIO), which means that the involvement of employees has to be increased to the degree that decision making regarding change is a shared task between management and employees (Sims & Sims, 2002).

For this research, it is important to understand how automotive companies deal with the challenges of electrification. Therefore, the question shall be asked whether automotive companies apply any kind of employee involvement that is similar to the recommendations presented in previous literature, or if automotive companies use different concepts and approaches to involve their employees in the change communication process.

2.5.3 Companies' communicative approaches to radical changes

Considering the discussion in Section 2.1.2 regarding process-driven change communication, it becomes clear that previous research has developed an understanding that companies often use process-driven change communication approaches. Previous research encourages companies instead to apply change processes with adequate communication steps (Barrett, 2002; Kotter, 1996, 2008).

Every change is challenging for an organisation, but some changes may be more challenging than others. In such cases, the literature talks about radical or extreme changes which have their own rules when it comes to internal communication (Heide & Simonsson, 2014; Jarzabkowski et al., 2019; Mazzei et al., 2012; Ozanne et al., 2020; Stoddard & Jarvenpaa, 1995; Strandberg & Vigsø, 2016; Todd, 1999). As stated before, electrification even qualifies as a crisis when considering previous definitions in the literature (Kovoor-Misra, 2019).

When considering an extreme or radical change, previous research has found that companies adjust their conventional communication practices and even apply new ways of communicating change. In this regard, Heide and Simonsson (2014) found that some organisations have crisis plans for radical change. However, they ultimately argued that during radical change, communication and crisis plans are obsolete since companies were found to call for help from communication professionals in their HR departments when crises occurred to apply ad-hoc change communication (Mazzei et al., 2012), leading to 'communication on demand' approaches which had an improvised character and thus limited the organisations in their general communicative orientation (Heide & Simonsson, 2014).

Within this study, it is further examined how communication approaches change when an organisation is faced with the challenges posed by radical change. Jarzabkowski et al. stated

that a '[...] mandated change, imposed by a powerful external actor, extends understanding of the dynamics of radical change' (2019, p.1). Ultimately, Jarzabkowski et al. (2019) found that organisations' communicative systems and strategies stopped working to a certain extent when faced with radical change. In these cases, managers were found to develop distinct reporting lines with separated information systems and work processes which had little or no resemblance to conventional company processes, which ultimately led to a restricted flow of information between departments (Jarzabkowski et al., 2019). In this regard, Ozanne et al. (2020) stated that a crisis communication plan is often not the key to success when organisations are faced with crises, hence an ad-hoc or improvised communication approach will ultimately allow any organisation in a radical change setting to be more dynamic and thus tailor any message specifically to the situation and the affected persons.

The literature discussed above concludes that during radical change or crisis communication an ad-hoc communication approach is often taken by organisations to adapt their communication more quickly to new challenges and difficulties. Ad-hoc and improvised communication are a response to radical changes and allows companies to respond more precisely and enables them to communicate to employees more directly. Furthermore, the literature suggests that during radical changes, organisations often have to apply sensemaking communication that directly addresses employees in order for them not to perceive the provided information as assumptions and rumours (Stoddard & Jarvenpaa, 1995; Strandberg & Vigsø, 2016; Todd, 1999). Therefore, this thesis explores how the three automotive companies react to electrification with their communication measures, and whether they will abandon their conventional change communication processes and communicate electrification-related changes in a more ad-hoc style.

2.6 Electrification-specific communication methods

While Section 2.5.3 has outlined communication methods that are suitable for conveying radical changes like electrification, this section shall consider suitable channels for communicating electrification by considering its possible effects on automotive companies. Since electrification will require the three automotive companies to change their current

business models, from building ICEs to building electrified engines, literature discussing appropriate communication channels that could facilitate a change of this magnitude shall be reviewed in this section.

2.6.1 Sensory communication using automotive products

As soon as electrification is fully implemented, fundamental engine components like pistons, bushings and bearings will be obsolete since electrified cars require different components like magnets, battery modules, power electronics and charging modules. Therefore, to communicate electrification to employees, it would be wise to present a conventional car together with an electric car, where employees can see and touch the different components and thus understand that an electric car requires far fewer components. This could ultimately create an understanding among employees that electrification constitutes a pressing change and that it has the potential to change the fundamental business model of the company.

Considering scientific insights into cognition and learning, it becomes evident that human learning and understanding, in addition to other factors, is based on observations within linguistic and physical systems (Brocklesby & Mingers, 2005; Horn & Wilburn, 2005; Maturana & Varela, 1987; Rosch et al., 1991). Following this logic, learning something new is based on observation of physical and linguistic channels that are offered by the environment. Therefore, sensory communication which offers a physical and linguistic component appeals to the learning process of recipients, supporting them in understanding the new changes that are provoked by electrification through an experience which leads to embodied learning.

Sensory communication has not been discussed as part of the change communication literature or in any context regarding the automotive industry. Therefore, this thesis aims to contribute an understanding how this communication can be used in the context of electrification. When considering the idea that physical components and cars could be at the centre of communication, it becomes clear that this communication channel is intended not as a learning event but rather as a communication event that aims to convey a striking message to employees regarding the effects of electrification.

When further considering sensory communication as a change communication method, it can be seen that this channel could be used to convey messages in an experience setting. In this

regard, the literature on experience economy, for instance, states that an experience could provide a meaningful learning component to the recipient, if the recipient perceives the communication as personally relevant and if the conveyed information is memorable and perceived as content that provokes feelings of sensation and experience (Pine & Gilmore, 1998a, 1998b; Poulsson & Kale, 2004; Yeoman & McMahon-Beattie, 2019). Therefore, sensory communication as a communication channel can be understood as an event or an experience with learning characteristics that appeal to its recipients on a personal level, in order for them to perceive the communicated content as striking and relevant and to support a learning process.

As the term ‘sensory communication’ indicates, this approach appeals to the senses of the recipients, making it easier for them to establish a connection between the products’ future and their own future. Appealing to the senses of the recipients is an approach that is not often found within the change literature, but this concept is discussed in anthropological and ethnological studies, where previous research has identified the power of sensory perceptions of one’s environment that can shape one’s understanding and feeling of reality (Lee et al., 2013; Pink, 2007, 2008, 2020; Vannini et al., 2013). Furthermore, sensory knowledge is obtained when experiencing new realities with senses additional to those stimulated senses used for conventional communication (hearing and seeing). This ultimately allows the recipient of sensory knowledge, which in the case of sensory communication can be understood as embodied imaginative knowledge, to obtain an understanding of the given surroundings with all senses (Vannini et al., 2013). This multi-sensory communication approach allows both the communicator and the recipient to experience the surroundings and communication object from different perspectives and therefore strengthens the bond between product, reality and recipient (Allen-Collinson & Leledaki, 2015; Howes & Classen, 2013; Orr et al., 2016; Vannini et al., 2013). Sensory communication in the context of electrification communication appeals to more senses than regular change communication, thus providing a multi-layered sensory communication approach to the recipients to support them in understanding how electrification will impact their future and their company’s future. It can also create a relatable reality that can be understood by everyone independent of educational background and position in the company and therefore is able to create a team identity based on the senses of the recipients, a dynamic that is also suggested by Lee et al. (2013). However, this understanding from Lee (2013) was not yet considered in automotive companies. Therefore, this thesis will contribute to the sensory

communication literature by examining this type of communication in automotive companies that are facing electrification.

The above-mentioned effect of the sensory communication approach can be increased by putting technological products at the centre of the communication channel, because it can be expected that most employees are interested in their companies' technology and innovation. Therefore, considering sensory communication as a channel that appeals to employees' affinity towards technology, a link between the communication content and the recipient can be established, and an enhanced understanding of electrification is likely to take place. Similar dynamics can be found in the literature where it is stated that the connection between employees and technology in professional environments are directly linked together and have the potential to shape a dynamic of power, knowledge, and motivation (Orlikowski, 2000). If sensory communication were to be adopted in the automotive sector, it can be argued that this communication approach would have the potential to connect recipients to the communication content and thus relate their own situation to the technology and the parts used for building the cars. This is especially important when considering the fact that innovative power comes from employees who shape innovation with their ideas and are thus connected to all products of their company (Kremer et al., 2019).

Although discussion of embodied and sensory learning is not found in the change literature or in research regarding change communication in automotive companies, this thesis will explore whether sensory learning is considered by the companies to possibly have a positive impact on recipients' learning and understanding of electrification.

2.6.2 Communication approaches facilitating pro-environmental behaviour

In addition to the technological changes caused by electrification, automotive companies are also required by governing bodies to decrease the CO₂ emissions from manufacturing processes and office work. These requirements from external governing bodies can be connected to companies' policy uncertainties, thus creating internal uncertainties, negative perceptions of a change and fears (Ahsan & Qureshi, 2021). Yet, the goal of many German companies is to become carbon-neutral or even emission-free in the future. CO₂ emissions that are not related to the product itself will have to be reduced or erased, which will require pro-environmental actions in all product- and non-product-related tasks by all staff.

Since all staff will have to act in an environmentally friendly way, pro-environmental behaviour in all departments will have to be encouraged and facilitated by management, since they developed the strategies and goals that have been set for their companies' environmental performance. In this regard, the literature shows that encouraging or facilitating pro-environmental behaviour through leadership and leaders' role model behaviour is a viable approach that has been proven to work in the past (Bamberg & Möser, 2007; Hargreaves, 2011; Robertson & Carleton, 2018).

Robertson and Carleton (2018) have shown in detail that leaders engaging in pro-environmental behaviour contribute to subsequent employee acceptance and support of, and engagement in, pro-environmental actions. While the authors have shown that leaders and managers can have a direct impact on employees' behaviour regarding pro-environmental actions, it should be added that intrinsic motivations such as moral ideas regarding the environment, even feelings of guilt, as well as self-selected environmental goals and emotional attachments can also positively influence employees to engage in pro-environmental behaviour (Bamberg & Möser, 2007; Osbaldiston & Sheldon, 2003; Salama & Aboukoura, 2018). In addition to intrinsic motivations, other personal and social factors such as religion, social class, urban vs. rural living and proximity to problematic environmental issues may influence the motivation for pro-environmental behaviour (Gifford & Nilsson, 2014). Nonetheless, it has been concluded that the encouragement or facilitation of pro-environmental behaviour in companies does work through managerial encouragement and subsequent programmes that demonstrate pro-environmental actions to all staff. However, this does not necessarily have to be a managerial task but could also be undertaken by an 'Employee Champions Team', which effectively is a taskforce responsible for the company's internal enhancement of pro-environmental actions (Hargreaves, 2011). Hargreaves' (2011) study has found that the 'Employee Champions Teams' only had a moderate impact on their colleagues and companies' overall environmental performance, although a positive shift towards reduction in waste and emissions was still observed.

Based on the literature presented above, the question for this research arises as to whether the three automotive companies also plan to become fully carbon-neutral or even emission-free and thus adopt further pro-environmental encouragement strategies in addition to electrification. This study also aims to identify whether policy uncertainties and resistances towards externally

imposed pro-environmental initiatives are present within the three automotive companies. Lastly, this thesis shall consider whether the three automotive companies apply strategies that ultimately have the goal of encouraging pro-environmental behaviour across all staff and to what degree they are similar or different to the presented concepts from the literature discussion in this chapter.

2.6.3 Pro-environmental goal setting and communication

In addition to introducing electrified and emission-free cars, German automotive companies also might want to become carbon-neutral. As discussed in Section 2.6.2, achieving carbon neutrality requires companies to reduce further CO₂ emissions linked to their product and other work-related tasks. The literature suggests that pro-environmental goal setting and the communication of pro-environmental goals has a positive effect on the motivation of employees and managers and thus could facilitate the companies change to become carbon neutral (Abrahamse et al., 2007; Gifford & Nilsson, 2014; Rabinovich et al., 2009; Staples et al., 2020; Steg et al., 2014).

While previous literature has often stated that pro-environmental goal setting has a positive effect on pro-environmental behaviour (Staples et al., 2017; Staples et al., 2020), the question arises as to what specific goals and communication measures were applied by communicators to enhance pro-environmental behaviour. Most pro-environmental goals consider a past and a future point in time which are used as orientation points in which the total CO₂ emissions of a company are compared. This approach has been discussed in the introduction in Section 1.2 which presented how governing bodies expect companies to lower their CO₂ emission by the year 2050 and compares those future emissions to the companies' emissions in 1990 (IEA, 2008; Leinemann, 2011; Mönnig et al., 2018).

To simplify pro-environmental initiatives and goal setting, Baard and Björnberg (2015) have found that it is possible to apply a short-term-based goal system which considers companies' emissions every business year. However, in this regard it has been suggested that companies need to know the overall reduction goals to react to emission changes in a timely manner with adequate investment in their companies. This could minimise the risk that companies could overshoot their plans for the near future. However, timely investments would be more economic if the governing bodies followed a long-term, pro-environmental goal strategy (Baard &

Björnberg, 2015). Another approach would be to set utopian goals for companies and their employees, such as the goal of achieving pre-industrial CO₂ levels in the atmosphere. Baard and Björnberg, however, propose setting ‘cautious utopias’ instead of applying utopian goal setting, which could be misleading for the recipients as it does ‘[...] not in any way explicitly refer to how the desired state of affairs can be achieved, and could be risky and inefficient in mitigating environmental risk’ (2015, p. 193). Abstract or utopian goals in professional settings can be hard to communicate to recipients. However, if utopian goals are applied regarding pro-environmental actions, the literature proposes that people perceive pro-environmental goals as a motivating factor when set with a specific plan, strategy, or mindset (Rabinovich et al., 2009). This means that utopian goals can only be fulfilled if management presents a clear and adequate breakdown of the plan to its employees, thus enabling them to understand how the pro-environmental goals will be achieved.

Considering the communication of pro-environmental goals, Staples et al. (2017, 2020) and Baard and Björnberg (2015) perceive pro-environmental goals set by governing bodies as sufficient to be directly used as internal communication approaches by companies which hope to consequently encourage and motivate their employees to act in a pro-environmental manner. Even though some employees might complain about the application of pro-environmental goal setting to change their behaviour (Feygina et al., 2010), the literature states that using pro-environmental goal setting communication as a standalone motivation communication approach can be sufficient to encourage positive behaviour among employees. This can be underlined by the understanding that the application of similar government-communicated, pro-environmental goals has been found to play a substantial role in the motivation of private household energy saving and energy conservation (Abrahamse et al., 2007; Gifford & Nilsson, 2014). In private settings, pro-environmental goal setting is bound to the goal conceptualisation of Lindenberg and Steg (2007), who have found that three categories of goals encourage positive behavioural outcomes: firstly, hedonic goals, which lead a person to seek new ways to improve their feelings; secondly, gain goals, which make individuals more sensitive to gains and losses of their personal financial or other resources; and lastly, normative goals, which are related to the correctness of one’s individual behaviour. However, these types of goals, which are applicable in private settings, are not similarly applicable in professional settings. When it comes to goal setting as a motivational approach in companies, the role of the manager as a leader is incredibly important during pro-environmental goal setting communication and is hard to compare to private pro-environmental goals. If leaders do not comply with their proposed

goals during changes, or in this case, even demonstrate non-environmentally friendly behaviour after communicating pro-environmental changes, employees will probably develop distrust towards internal pro-environmental changes (Ayub et al., 2014; Ford & Ford, 1995; Ford et al., 2008; Kotter, 1996). Therefore, previous research proposed that leaders should encourage employees' autonomy in order for them to be more motivated to execute pro-environmental behaviour goals, and by doing so, leaders can expect that employees will act more pro-environmentally in the short term and will maintain that behaviour in the long term (Osbaldiston & Sheldon, 2003). Based on the literature presented in this section, this thesis aims to understand how pro-environmental goal setting can influence recipients' motivation to engage in pro-environmental behaviour which will ultimately support electrification as a change if the total CO₂ emissions of companies are consequently reduced.

2.7 Perceptions of electrification-specific communication methods

2.7.1 Perceptions of change-specific communication approaches

Since this literature review has shown that electrification as a change shares many characteristics with radical changes and internal company crises, communication of electrification might share similarities with crisis communication or communication of radical changes. Therefore, it is important to understand how change communication regarding electrification is ultimately perceived by managers and employees.

2.7.2 Perception of external media change communication

The introduction of this thesis has shown that electrification is of great interest for society and the public, hence external media channels like newspapers and social media report on electrification. This thesis defines all change-related communication that happens outside the company as external change communication, even when the company itself does not communicate changes to the public but when external communication sources like social media do so. Therefore, this section shall address the literature which considers staff perceptions of external media communication.

Previous research has found that recipients of internal company communication can develop either a trust or a distrust relationship with communication channels and information sources depending on their content and channel consistency (Bordia et al., 2004; Brashers, 2007; Tyquin et al., 2020). Considering this argument, external company communication and media communication, which always use a variety of communication channels, could lead to recipients of change communication developing distrust towards the change communication, since they might be overwhelmed by the variety of communication channels and information. Other research has indicated that during internal changes, employees are often found to be invested in their companies' progress and thus to want to learn about current changes by obtaining as much information as possible from a variety of sources (DiFonzo & Bordia, 1998; Kitchen & Daly, 2002). Whether this approach is beneficial for employees remains questionable when considering the studies of Bordia et al. (2004) and Brashers (2007), since change communication recipients might be exposed to many inconsistent communication and information sources such as social media, newspapers, company press statements and TV news. Furthermore, other studies addressing change communication and external change communication have concluded that change communication recipients want to obtain as much information as possible about upcoming changes (Allen et al., 2007; Hargie & Tourish, 2009; Larkin & Larkin, 1994). In this context, the understanding was established that during times of change, employees would generally prefer to receive information from their managers or superiors than from external channels. Therefore, this thesis aims to identify the preferences of change communication recipients and how they ultimately perceive external communication and information sources that convey specific change messages regarding electrification.

2.7.3 Perception of pro-environmental goal communication

All German automotive companies comply with federal and European environmental legislation that prompts these companies to become carbon-neutral in the future. This requires the companies to ensure the carbon neutrality of their products and their production processes. Considering these circumstances, previous research has established the understanding that pro-environmental goal setting is a viable means of motivating and encouraging pro-environmental behaviour of employees. This section of the literature review shall thus consider previous research that has addressed the questions of how positive and negative perceptions of pro-environmental goal communication can emerge and how they can influence the overall perception of a change.

When considering the literature addressing managerial and pro-environmental goal setting, various concepts are discussed, indicating that different goal characteristics and circumstances can lead to either the acceptance or the rejection of goals. While some research has found that an ambitious goal is directly linked to high employee motivation and seems to increase willpower in employees (Ismail, 2017; Locke & Latham, 2006), other concepts, such as SMART goals, are discussed which describe how goal-specific characteristics can influence the success of managerial goal setting. In this context SMART stands for Specific, Measurable, Attainable, Relevant and Time-Bound goal characteristics that need to be inherent to the applied goals to be accepted by the recipients (Cothran & Wysocki, 2005; Lawlor, 2012; Sull & Sull, 2018). If all characteristics of the applied pro-environmental goals are SMART, it is expected that goals are ultimately regarded by the recipients as positive and motivating. However, SMART goals do not always guarantee positive effects on the recipients' side, since more recently it has been suggested that recipients also require a sense of satisfaction with their work environment, and especially their team environment, to accept their company's goals and thus be motivated by them (Goffnett, 2020).

Previous research on pro-environmental goal setting indicates that such goals can have some positive effects on the recipients (Baard & Björnberg, 2015; Staples et al., 2017; Staples et al., 2020). However, other research found that especially public perception for such efforts is negative, and consequently, participant engagement in achieving pro-environmental goals is low (Shaw et al., 2018). This can be explained by the fact that the public often lacks fundamental trust and develops uncertainties when decision-makers require substantial lifestyle changes from their recipients (Shaw et al., 2018; Steentjes et al., 2017). Furthermore, previous research found that pro-environmental goal communication is a difficult task for any communicator since a substantial amount of uncertainty and misinformation regarding environmental issues is currently present among the recipients, leading to their scepticism and the rejection of climate change initiatives (Shaw et al., 2016).

This thesis, however, will consider in detail how pro-environmental goals in automotive companies are perceived and under what circumstances they lead to employee motivation and acceptance and thus to improved environmental performance of recipients.

2.8 Communication methods provoking uncertainty and distrust

As the presented literature has shown so far, some change communication approaches, for instance goal setting, either can allow recipients to be motivated and supportive of changes or can provoke resistance, depending on the circumstances in which the change communication is applied. However, previous studies have identified communication approaches that will most likely provoke resistance, which will be presented in this section.

2.8.1 Negative perception of change communication through inconsistent manager behaviour

The change literature has often indicated that managers and leaders need to act as exemplars during changes to motivate and inspire their employees. Furthermore, through management's active behavioural demonstration and behaviour consistent with their communication in relation to newly proposed changes, employees can understand the urgency of changes, which also constitutes a source of motivation and thus encourages subsequent positive employee behaviour towards new changes (Ayub et al., 2014; Ford & Ford, 1995; Ford et al., 2008; Kotter, 1996).

Leaders play an exemplary role and need to show consistent behaviour in line with their change communication in order for their employees not to develop distrust and uncertainty. Similarly, the literature specifically focused on pro-environmental behaviour states that managers need to fulfil their exemplary roles when they aim to encourage pro-environmental behaviour among their employees (Bamberg & Möser, 2007; Gifford & Nilsson, 2014; Hargreaves, 2011; Osbaldiston & Sheldon, 2003). If, however, management's pro-environmental behaviour does not exemplify their previous communication which has urged all staff to assume pro-environmental behaviour, employees and change communication recipients are likely to resist and distrust management. Therefore, this thesis asks how the employees at the three companies perceive their managements' behaviour regarding their previous change communication and whether manager behaviour impacts the employees' overall perceptions of electrification as a pro-environmental change.

2.8.2 Vague communication about department changes and layoffs

Electrification will reduce the number of required parts for ICEs, which will result in a decrease in the number of production steps, required manual workers and employees that work closely with the products required for ICEs (Casper & Sundin, 2020). Many previous studies have stated that employees in general require a high level of information regarding changes, especially when it comes to job security and internal restructuring of departments and production processes (Allen et al., 2007; Bel et al., 2018; Daft & Lengel, 1986; DiFonzo & Bordia, 1998; Jimmieson et al., 2004; Kitchen & Daly, 2002; White et al., 2010).

Automotive companies might not be able to maintain and preserve all manual working processes when full electrification takes place. Considering the change literature, clear examples of sources of uncertainty during changes are presented. Layoffs and department mergers are possible triggers for resistance. Previous research has established the understanding that this resistance results from employees' fear of losing control during changes (Bordia et al., 2004; French, 2001; Herold et al., 2007; Herzig & Jimmieson, 2006). In the case of Delta Air Lines, which can be found in this literature review in Section 2.1.2, it has been shown that a simple announcement of possible layoffs triggered employee coping and defence mechanisms that led employees to demand more information about the proposed changes (Delta Air Lines, 1994). Other research has found that vague announcements trigger job insecurity among employees (Abildgaard et al., 2018; Sverke & Hellgren, 2002; Sverke et al., 2008). Based on the described nature of electrification, this change could heavily impact the employment situation at the three automotive companies. Therefore, this thesis aims to understand how communication regarding possible layoffs and downsizing procedures might impact employees' perceptions of electrification.

2.8.3 Distrust and rejection of new change communication channels

This literature review has already addressed various communication sources that can lead to distrust and rejection of change initiatives. However, it must be added that the application of new and unfamiliar communication channels could also lead to distrust and rejection of changes themselves.

Previous research has found that only communication approaches that are trusted by employees have the potential to build an internal sense of commitment and trust towards management's decision making and communication practices (De Ridder, 2004; Elving, 2005; Scholz & Scholz, 2018). However, in this literature review, previous literature was considered that indicates that electrification could qualify as a radical change or a crisis, which means that subsequent crisis communication could be applied. As presented in Section 2.5.3, one attribute of crisis communication is the possible change of pre-existing communication methods and the subsequent adoption of new communication methods that are tailored to overcome the crisis. Especially when considering communication of climate related issues, previous research has found that companies were found to change their conventional communication practices and adopt new linguistic strategies (Ferguson et al., 2016). Should crisis communication be applied to communicate electrification, it is possible that various communication approaches and channels could be used by the companies. In this regard the change communication literature shows that shifting an internal change communication strategy towards communication approaches that have attributes of crisis management could lead to distrust and scepticism among employees (Heide & Simonsson, 2014; Jarzabkowski et al., 2019; Mazzei et al., 2012; Nienaber et al., 2021; Ozanne et al., 2020; Stoddard & Jarvenpaa, 1995; Strandberg & Vigsø, 2016; Todd, 1999).

Traditional literature on change communication often distinguishes between formal and informal communication channels during changes as well as the flow of communication content (Johnson et al., 1994; Mohr & Sohi, 1995). In addition to formality, familiarity with communicators and channels play a significant role in accepting communication content (Adams et al., 2005; George et al., 2013; Lipiäinen et al., 2014; Sanina et al., 2017). A change message can be conveyed as an informal message and still be accepted by the recipients if the communicator is familiar to the recipients and the communication content has a recognisable purpose (Wang et al., 2019). This is in line with the understanding that consistent and purposeful use of communication channels leads to positive identification with change messages and defuse uncertainties (Radovic Markovic & Salamzadeh, 2018). While this literature review has presented previous research indicating that electrification as a pro-environmental change could be communicated using unconventional or new communication methods and channels, this thesis aims to understand how these new channels are ultimately perceived by the employees and the change communication recipients.

2.8.4 Managers' perceptions of change communication

When considering the literature regarding managers' perceptions of change communication, it becomes obvious that it is challenging to derive an understanding of how managers will ultimately perceive change-specific communication. Most managers are the communicators of changes and are thus not often considered in research that addresses the perception of change communication.

Previous research has found that managers who do not support a change initiative or even resist the change themselves are unlikely to communicate the change in a positive way, which ultimately leads to employees also resisting the change (Koning & Van Kleef, 2015; Oreg & Berson, 2011; Stewart & Barrick, 2004). Thus, during turbulent times of change, executives and especially middle-managers need to show courage and represent positivity in their communication approach in order for their staff to accept and support change initiatives (Buick et al., 2018; Furnham, 2002; Kotter, 1996). Usually, however, it is the case that managers show support for a change and consequently perceive changes positively. Hence, resistance towards changes is more often found among the recipients or contributors of changes (Wagner, 2006).

Based on the literature presented above, this thesis asks whether the managers in the three automotive companies have similar perceptions of the applied change communication practices and how they will ultimately perceive their specific change approaches regarding communicating electrification. Since previous studies have often focused on employee-specific perceptions of change communication, this study will also consider the managers' perceptions.

2.8.5 Conclusion of the literature review

To conclude this literature review, it can be stated that there is a significant amount of previous research focusing on change management and change communication. However, there is only a small amount of literature on electrification and pro-environmental changes in large corporations.

Previous research on (conventional) change communication has often tried to derive best practice methods for most effectively managing and communicating changes. Thus, the main objective of this explorative case study is to provide an understanding of how electrification as

a pro-environmental change is communicated in German automotive companies. Furthermore, the question is considered whether the change communication methods and strategies proposed in previous research are equally applicable to the current pro-environmental changes in German automotive companies or German automotive companies use different strategies and methods to communicate electrification and its inherent pro-environmental changes. This thesis is consequently also considering the questions of how the communication regarding electrification differs from the proposed change communication methods presented in previous research and how the recipients ultimately perceive the communication. Moreover, the impacts of different modes of change communication that have emerged through electrification are also considered.

3. Chapter Three: Methodology

While the objective of this research was defined in the introduction and in the literature review, the research approach and the applied methods will be discussed here. This current chapter shall present the chosen research approach as well as provide insight into the applied research philosophy and methods applied by this thesis.

3.1 Introduction to the methodology

The term ‘research’ is described as the process of exploring and defining new facts and realities, using a scientific approach to establish them (Creswell & Creswell, 2017; Hammersley, 1992; Hennink et al., 2010; Leedy & Ormrod, 2005). The research approach or ‘methodology’ has been traditionally further divided into broader fields or categories: qualitative research, quantitative research, and mixed methods (Leedy & Ormrod, 2005). To consider the participants’ perceptions of electrification and their managers’ subsequent communication, the appropriate research process, methods, and philosophical position had to be defined before the data collection process commenced.

To ultimately answer the proposed research questions that emerged from the literature review, a multiple case study structure was applied, in which Company Albert, Company Bertha and Company Carl were considered. For this thesis, the term ‘case study objects’ was used to define the three companies. A total of 41 semi-structured interviews were conducted at the company

sites. In each case study object, ‘managers’ responsible for the communication of electrification were interviewed, as well as employees who were the recipients of electrification and its communication. This thesis’ chosen case study approach involved analysing secondary data, including government-published documents and company internal documents as well as observations made in the case study objects (Baxter & Jack, 2008; Crowe et al., 2011; Sørensen et al., 1996; Stake, 1995; Tellis, 1997; Yin, 2011). The reason why a case study structure was applied was the fact that this study approach structured the research objects in the most effective way and was thus considered to be the most appropriate for answering the research questions. In particular, the explorative nature of the research questions and the embedded data triangulation within the applied case study structure were a significant help in organising and analysing data.

3.1.1 Research process

A carefully designed research process was used as a guiding element at the beginning of the research, ensuring consistent scientific conduct which ultimately ensured the validity and coherence of the collected data. The research process was based on an understanding of previous research regarding scientific conduct which led to the conclusion that five steps had to be taken for this thesis to yield data and findings of high quality (Hennink et al., 2010; Kothari, 2004; Ritchie et al., 2013; Yin, 2009a),

- Definition of research problem / research questions
- Incorporation of literature and theories
- Designing research methods for data collection
- Data collection
- Interpretation of data

When considering this research process, which was derived from the sources presented above, it becomes evident that this thesis has so far outlined and defined the research problem through a review of the literature on the research area. Thus, the next steps which must be taken to ensure a complete and coherent research process were (i) designing an adequate research method for data collection, (ii) data collection, and (iii) interpreting and analysing the collected data.

3.2 Philosophical research approaches

3.2.1 Introduction to core philosophical concepts

This section shall present the philosophical standpoint which ultimately led to the methodological choices made regarding this thesis. Three core philosophical concepts were considered which ultimately influenced and shaped the overall philosophical position. Burrell and Morgan (2017), following much of the literature, categorised these three core concepts as ontology, epistemology, and methodology. The following bullet points are paraphrased from Burrell and Morgan (2017),

- The term ontology is of Greek origin and consists of the terms ‘on’ which means ‘being’ or ‘to be’, and the term ‘logos’ which means study; therefore, ontology can be described as the study of being. Thus, ontology can be referred to as the study of everything that ‘is’ or what can be considered as reality.
- Epistemology is a combination of the Greek words ‘episteme’ which means knowledge and ‘logos’, study. Therefore, it can be said that the term epistemology constitutes the science of knowledge and how knowledge is obtained.
- Methodology can be understood as the process that allows a researcher to obtain knowledge of the social world and is based on a combination of ontological and epistemological viewpoints.

(Burrell & Morgan, 2017)

3.2.2 Ontological standpoint: Assuming a relativistic standpoint

As described in Section 3.2.1, the ontological standpoint of a researcher describes his or her perception of reality and the world, which includes the perception of objects and social groups. While Burrell and Morgan (2017) have provided explanations regarding the differences between ontology, epistemology, and methodology, the distinct nature of these concepts must be considered to choose a ‘position’ for each philosophical concept.

Considering exclusively the ontological standpoint, Moon and Blackman (2014) offer a more detailed insight into this philosophical concept than Burrell and Morgan (2017), stating that ontological positions can be separated into two broad categories: realism and relativism. These two categories are at respective opposing ends of a spectrum. Relativistic worldviews describe reality as a multiple, mental, and intangible construction uniquely inherent to everyone. Relativism allows reality to be altered through social exchange, communication, and reciprocity, so that specific groups or cultures and the individuals within these groups might perceive the world differently than other groups or cultures. Therefore, realities are destined to change because they are constructed in a historical and social context which can be altered through continuous exchange between cultures and individuals over time (Crotty, 1998).

When translating this understanding to electrification, it can be assumed that currently the reality of the research participants who work in the automotive industry is altered. This change in perception of reality happens through exchange between management and employees, as well as exchange between people in companies. Through their continuous exchange regarding electrification and its impacts, new realities are constructed in German automotive companies. The advantage of this worldview for this thesis lies in the fluidity of realities that can each be studied in different companies and organisations as well as in smaller units of analysis such as departments of the respective companies. It can thus be assumed that the collected data was created through the exchange regarding electrification that was and still is happening in the companies where managers and employees alike engage in a continuous dialogue regarding electrification across their groups and within their groups. Furthermore, the exchange that takes place between the researcher and the participants of this study must also be considered since researcher and participants are also interactively linked and engage in an exchange that creates a new reality (Guba & Lincoln, 1994).

By applying a relativistic viewpoint focusing on the participants' perceptions regarding electrification, it must be assumed that new realities and perceptions of the participants can be created through social exchange and interactions (Chernyak-Hai & Rabenu, 2018; Wischniewski et al., 2009). The advantage for this thesis that can be drawn from the relativistic ontological assumption is the fact that this viewpoint supports the idea that the study participants' perceptions of reality will ultimately constitute the driving force for accepting or not accepting changes. The literature on change communication presented in Chapter Two has shown that change recipients most likely enter an exchange phase after receiving electrification-

related change communication (Bratton & Gold, 2017; Klein, 1996). This means that employees discuss communicated changes with each other and thus, they are engaging in a cultural exchange which can alter their perceived reality regarding the communicated changes.

While the applied relativistic ontology of this thesis supports the idea that social exchange will be the driving force to either accept or reject electrification, it must be added that the ontological assumption that reality is completely static or that there is only one true reality is doubted even by most realists (Moon & Blackman, 2014). Although realists believe in one reality, they acknowledge that the surroundings of reality, such as history, technology, norms etc., will constantly change through human intellect, thus leaving realists with the aim of trying to describe reality as closely as possible (Guba & Lincoln, 1994; Moon & Blackman, 2014). However, in the context of this study a realist standpoint is considered as an approach that could potentially limit the focus to one reality shared by many participants. Therefore, by applying a realistic standpoint, only the given status quo at the time when the data collection took place at the automotive companies could be described. While realism offers many advantages when focusing on realities that can be considered as constructs and are hard or impossible to alter by individuals, this ontological standpoint is considered to fall short of considering the multidimensionality of constructed realities in changing work environments. Thus, it is believed that the applied relativistic ontology can best grasp the nature of change communication and its reciprocity.

As a concluding statement to this section, it can be said that the assumed ontological standpoint of relativism considers each of the automotive companies as distinct cultural entities including the participants' unique perceptions of electrification. By applying an ontological standpoint with the linked assumption that perceptions and realities can be altered through social exchange and communication, it is intended to show whether electrification has the capability to change reality for the participants.

3.2.3 Epistemological standpoint: Applying a subjectivist study approach

Fundamental questions that needed to be asked when facing the decision to take an epistemological standpoint are, for instance, 'By what means have we acquired knowledge? What is the scope and dimension of our knowledge? How can we trust the reliability of our truth-claims?' (Magrini, 2010, p.2) and 'What is knowledge? Can we know anything at all?'

How do we obtain knowledge?’ (Pojman, 1999, p.2). Moreover, to provide a substantial insight into the epistemological choices made in this thesis, the researcher’s perspective regarding the acquisition of knowledge is considered as well as the perspective of the study participants, where the question is raised: how they can obtain knowledge and what they can know?

3.2.3.1 Epistemological considerations regarding the theory of knowledge

Previous research has established that the theory of knowledge and the acquisition of knowledge consists of many competing views within the scientific discipline (Audi, 2010; Dancy, 1985; Hammersley & Atkinson, 2019; Hulme, 2016; Pojman, 1999). Nonetheless, a working model has been created to explain the fundamental characteristics of human knowledge by stating that it is ultimately composed of three characteristics. If a person believes (belief) something that is true (truth) and holds a reasonable justification (justification) for it, then a person knows. Based on these three inherent components, this model is regarded as the tripartite theory of knowledge (Audi, 2010; Hulme, 2016; Pojman, 1999; Woozley, 2015). The same researchers that support this model also consider knowledge as a justified and genuine belief that can be further split into three main types of knowledge: knowledge by acquaintance (persons), competence knowledge (knowhow), and propositional knowledge (descriptive knowledge) (Audi, 2010; Hulme, 2016; Pojman, 1999; Woozley, 2015). While there have been attempts to challenge the tripartite theory of knowledge (Hulme, 2016), these attempts have failed to establish themselves, thus the above presented theory of knowledge persists and is widely used in epistemological research.

Epistemological research is often interested in the third type of knowledge, propositional knowledge, as it seeks to understand the nature of knowledge by asking one fundamental question: ‘How do we obtain knowledge?’ (Pojman, 1999, p.2). To answer this question, the fundamental source of knowledge is sought. Rationalists for instance state that knowledge is exclusively based on reason and that knowledge’s propositions are innate or known *a priori* (Pojman, 1999). However, other researchers have stated that one concept alone is not sufficient to answer the question of how knowledge is obtained. Thus, previous studies have proposed that a mixture of theories is necessary when explaining the source or origin of knowledge compared to using the understanding of only one of the underlying theories of empiricism and rationalism alone (Hammersley & Atkinson, 2019; Pojman, 1999). Hammersley and Atkinson (2019) have argued that there are blurred lines between the established concepts that consider

the obtainment of knowledge. On this matter, it can be concluded that it is most likely that the synthesis of prior knowledge and newly made experiences form new knowledge and that therefore a mixture of empiricism and rationalism offers the most rounded explanation regarding the obtainment of knowledge.

3.2.3.2 Applying a subjectivist study approach

Based on this fundamental understanding of the creation of knowledge and the presented ontological standpoint of this thesis in Section 3.2.2, the epistemological approach of subjectivism was chosen. The reason for this was the underlying assumptions that subjectivism seeks meaning which exists within the studied subject and that the subject ultimately transports meaning to an object (Moon & Blackman, 2014). Moreover, when closely considering the chosen epistemological approach of subjectivism, it aimed to derive knowledge from each research object by applying a deductive approach to identify culturally and socially constructed patterns in the different research objects, since it is believed that the meaning sought exists within the research objects (Hammersley, 2017; Moon & Blackman, 2014). This thesis tried to study the participants' perceived reality, which was most likely pluralistic and bound to internal and external systems of symbols and languages (Lincoln & Denzin, 2000; Moon & Blackman, 2014; Powell, 2001; Pratt, 1998). Thus, the applied subjectivist approach was able to directly focus on the participants' perceptions of their current situation since people often impose meaning and value on their worldview, and this was what this thesis sought to study (Crotty, 1998; Moon & Blackman, 2014; Pratt, 1998). The epistemological approach of objectivism was also considered for this thesis, but an objectivist research approach would not have aligned with this thesis' ontological standpoint, and its application would have made the objective of this study difficult to achieve. This is mainly because objectivist approaches try to find correlations and connections between the study object and the real world since they perceive that one reality exists which is there to be studied (Patton, 2014; Pratt, 1998).

3.2.3.3 Considering the researcher's and the participants' access to knowledge

In epistemological theory, knowledge can be derived from each participant by using a deductive research approach. In this regard, culturally and socially constructed patterns can be identified in the different research objects since it is believed that the sought meaning or knowledge exists within cultures and social constructs such as automotive companies (Hammersley, 2017; Moon

& Blackman, 2014). However, when considering the question of what kind of knowledge is accessible to the participants and following the logic of the synthesis of empiricist and rationalist epistemological ideas, each participant possesses different knowledge that is exclusively inherent to him or her. This can be explained with both the rationalist and empiricist parts of this ideological synthesis. The rationalist ideal claims that prior knowledge is needed to form new knowledge, and the empiricist part states that new knowledge is made through new experiences.

Prior knowledge is diverse and differs from participant to participant. However, like prior knowledge, new experiences can differ, too, since each participant might perceive new situations, such as changes, differently. This ultimately means that, based on differing prior knowledge and differently perceived experiences, each participant creates their own knowledge that does not have to be similar to the knowledge of other participants, since new knowledge of an individual is inherent to their personal life-world (Assmann, 1988; Habermas, 1981; Schütz & Luckmann, 2017). While the participants in automotive companies engage in social exchange and establish conventionalised reciprocity, new cultural and collective knowledge in companies is created which can be accessed by third party observers when cultural products such as company texts, architecture and other cultural artefacts are considered or when a researcher enters the life-worlds of participants through face-to-face interviews or conversations (Bolten, 2013; Hofstede, 2001). This is another reason why a subjectivist epistemology is applied, since this approach considers individual knowledge and realities because of its deductive character (Lincoln & Denzin, 2000; Moon & Blackman, 2014; Powell, 2001; Pratt, 1998). Moreover, the subjectivist approach accesses participants' knowledge and realities on an individual level, and individual findings can subsequently be referred to a bigger picture, namely to the company level, since subjectivism seeks meaning that exists within the studied subject, which ultimately transports meaning to an object (Moon & Blackman, 2014). This is the fundamental characteristic of the described conventionalised reciprocity that takes place in knowledge creation of the participants.

3.2.4 Research philosophy: Interpretivist research philosophy to study meaning and individual perceptions

In the literature there are several competing views regarding research philosophy. However, positivism and interpretivism are those the most considered by previous studies regarding

research philosophy (Anderson, 1983; Hammersley, 1992; Hennink et al., 2010; Moon & Blackman, 2014). Based on the description of the ontological and epistemological standpoints, an interpretivist research approach was chosen, which led to the application of qualitative research methods that were most suitable for answering this thesis' research questions.

Interpretivism is described as a research philosophy supporting the idea that natural science methods cannot be used when undertaking research in social science and that the underlying interpretations of reality are derived from culture and are historically situated (Hammersley, 2017; Moon & Blackman, 2014). This means that in the specific case of this thesis, attention was focused on the perceived reality of each participant and the totality of all participants' perceptions in each automotive company towards electrification while also considering each perceived reality of the individual participants (Moon & Blackman, 2014).

If a positivistic research approach had been applied, this thesis would not have been able to fully consider the participants' individual perceptions towards electrification and its communication to the extent an interpretivist research approach would. It has been stated by (Hennink et al., 2010, p.37) that the positivistic research philosophy '[...] forms the foundation for the natural sciences and for experimental research and quantitative studies in the social sciences'. Within positivism, there is an emphasis on objective measurement of social issues, where it is assumed that reality consists of facts and that researchers can observe and measure reality in an objective way with no influence of the researcher on the process of data collection. Furthermore, Anderson (1983) argues that there are two pillars on which the concept of positivism stands: logical 'empiricism' and 'falsificationism'. However, since this thesis aimed to identify the participants' perceptions of electrification by considering their understanding and prior experiences in relation to electrification, an interpretivist research philosophy was considered to be more suitable. This choice is supported by the fact that an interpretivist research approach focuses on trying '[...] to understand people's lived experience from the perspective of people themselves, which is often referred to as the emic perspective or the "inside" perspective' (Hennink et al., 2010, p.37). Moreover, an inductive study approach driven by a hypothesis was considered to overcomplicate the task of exploring the personal experiences and perceptions of the participants.

It can be concluded that, for this thesis, the application of an interpretivist research philosophy was deemed the most suitable. The main reason for this choice was the fact that an interpretivist

approach considers each participant's perception individually and thus an overgeneralisation of a participant group or a whole company was avoided.

3.3 The qualitative, quantitative, or mixed methods decision

The decision whether this thesis should follow a qualitative, quantitative, or mixed-method research approach was partially answered in Section 3.2, where the philosophical position was presented. Based on the understanding obtained from the discussion in Section 3.2, an interpretivist research philosophy is not compatible with a quantitative research approach. Nonetheless, this section will outline and discuss previous research regarding pro-environmental changes.

3.3.1 Quantitative approaches to pro-environmental change research

Nielsen and D'haen (2014) reviewed 622 journal articles published in the *Journal of Global Environment Change* since the year 2000. For their review, they considered research regarding organisations' transitions towards pro-environmental behaviour, green information systems or other ecological transitions. It was subsequently concluded that out of 82 articles regarding pro-environmental change and adoption of climate-friendly actions, only one-fourth of the research had a qualitative focus, which means that, in turn, most pro-environmental research applied quantitative research methods, mainly using questionnaires and numerical analysis for their data collection. This previous research which applied quantitative research methods was mostly of a positivistic nature, posing hypothesis-based research questions and relying on questionnaires as the primary data collection tool (Nielsen & D'haen, 2014).

Lee (2020) also reviewed research focusing on organisational transitions towards green information systems (IS). Lee's (2020) approach also considered pro-environmental changes and thus had a similar focus to the questions of this study. Most research addressing the factors either positively or negatively impacting green IS performance are of a quantitative nature (Anthony Jr, 2019; Chuang & Huang, 2018; Khuntia et al., 2018; Nanath & Pillai, 2017; Nishant et al., 2017). Similarly, the research addressing the adoption of or change towards green IS was found to predominantly use quantitative research methods, with most studies applying

methods from econometrics and structural equation modelling (SEM) (Asadi et al., 2018; Cai et al., 2013; Carberry et al., 2019; Chen et al., 2011; Dalvi-Esfahani et al., 2017; Dalvi-Esfahani et al., 2019; Gholami et al., 2016). Moreover, the field of pro-environmental behaviour research also applies quantitative research methods that often use questionnaires asking the study participants to self-report on their environmental performance in either a professional or private setting using psychometric data (Lange & Dewitte, 2019; Meyer, 2015). Despite the dominant use of quantitative research methods in the context of green IS research, its use is disputed, the main criticism being its impersonal evaluation of the study findings, which rarely focuses on the participants' understandings and personal perceptions of green changes and the consequences pro-environmental transitions could have for their personal or professional lives (Burns & Groves, 1997; Coughlan et al., 2007).

This thesis aimed to understand the participants' personal perceptions of electrification and the communication of electrification. As is suggested above, given that quantitative research methods are in stark contrast to this thesis' research focus, a quantitative research approach would have been limited in showing personal perceptions and experiences in an in-depth manner and was thus considered unsuitable for this thesis' purpose.

3.3.2 Qualitative approaches to pro-environmental change research

As shown in Section 3.3.1, Lee (2020) found that many studies regarding the organisational adoption and the subsequent performance of green IS are quantitative. On the other hand, there are also studies that have adopted a qualitative research focus when addressing similar topics, but these studies applied different focal points (Brooks et al., 2018; Centobelli et al., 2020; Jongsaguan & Ghoneim, 2017; Seidel et al., 2013). However, other research that considered the encouragement of pro-environmental behaviour and its communication was found to be of a qualitative nature (Caniato et al., 2012; Hargreaves, 2012; Steg & Vlek, 2009; Strife, 2010).

Lee (2020) identified that all of these qualitative studies regarding the organisational adoption and the subsequent performance of green IS applied qualitative research approaches such as observations and interviews; many applied an embedded case study approach. However, no studies were found that applied a similar research approach to this thesis, namely, a multiple case study approach using semi-structured interviews. Literature addressing the behavioural side of the encouragement of 'pro-environmental behaviour' is predominantly of a qualitative

nature and aims to understand the behavioural actions of social actors when faced with the task of acting in a more environmentally friendly manner (Caniato et al., 2012; Hargreaves, 2012; Steg & Vlek, 2009; Strife, 2010). Other previous qualitative studies addressing behaviour in conventional change settings have put much focus on change recipients' attitudes towards and perceptions of changes (Altunay et al., 2012; Armenakis et al., 1993; Chreim, 2006; Khan et al., 2016; Nixon, 2014).

While the behavioural side of conventional and pro-environmental change research is often found to use qualitative research methods, its weaknesses equally must be incorporated in the evaluation. Most of the studies presented in this section used interviews or focus groups as the primary data collection technique. These research techniques make the presence of the interviewer inevitable and therefore can also affect and influence the interviewees' responses. Based on this interference with the participants and the constant direct contact with the researcher during data collection, rigour is often harder to maintain and demonstrate. According to Anderson (2010), the research quality of qualitative studies is thus strongly dependent on the skills of the researcher. This also inevitably leads to a questionable consistency of qualitative research approaches regarding their quality and validity (Carroll & Swatman, 2000).

As Section 3.3.1 has shown, quantitative research approaches make it difficult to gain an in-depth understanding of the participants' personal perceptions and feelings towards electrification as a change, thus a qualitative research approach was perceived as the most suitable approach for this thesis. Moreover, this section's consideration of previous studies regarding pro-environmental change has also shown that there is a relative lack of qualitative studies addressing questions regarding pro-environmental changes in organisations.

3.3.3 Reflecting on this thesis' methodological contribution

In Section 3.3.1, it was explained that some quantitative studies used self-reporting questionnaires asking the participants to self-report on their (pro-)environmental behaviour (Lange & Dewitte, 2019; Meyer, 2015). While the applied semi-structured interviews in this thesis also required the participants to self-report their pro-environmental behaviour and their perceptions of pro-environmental change, the difference lies in the obtained data. The self-report questionnaires extracted quantitative psychometric data. This thesis aimed to derive qualitative data containing detailed self-reflection, perceptions, and emotions, enabling the

researcher to explore the participants' feelings, including fear and uncertainty. Therefore, it aimed to address the main criticism of quantitative green-IS and pro-environmental change research by incorporating a personal lens into the research approach since the participants' perceptions, feelings and experiences are taken into consideration through this research approach (Burns & Groves, 1997; Coughlan et al., 2007). This ultimately allowed this thesis to focus on the interpretation of the human side of pro-environmental changes and pro-environmental behaviour.

Section 3.3.2 further showed that some previous studies addressing pro-environmental behaviour have applied qualitative research approaches, using conventional research methods like focus groups and interviews. These studies aimed to understand the behavioural actions of social actors when faced with the task of acting in a more environmentally friendly manner and putting a greater focus on the attitudes towards and perceptions of new changes (Caniato et al., 2012; Hargreaves, 2012; Steg & Vlek, 2009; Strife, 2010). This thesis similarly focused on the personal perceptions of the participants regarding new pro-environmental changes. However, a case study structure was applied here. This approach focused on more than one study object within the automotive industry, thus considering a broader scope of pro-environmental change. While there have been studies focusing on electrification, these studies considered technological aspects of this change or possible implementation approaches for electric drivetrains (Budde et al., 2015; Mazur et al., 2015; van der Vooren & Brouillat, 2015). One case study was found in the context of electrification which focused on the location-based implementation of electric vehicles (Nykvist & Nilsson, 2015). By focusing on a specific industry and demographic and by applying a case study structure that includes the triangulation of other research methods such as observations and the consideration of company documents, this thesis has the potential to contribute to the field of pro-environmental change and electrification research, as it widens the scope of the research compared to the application of only one qualitative research method such as interviews or focus groups.

This thesis' applied case study structure focuses exclusively on German automotive companies to derive an understanding regarding electrification as a pro-environmental change. Since electrification is a current theme within the German automotive industry, this study applied an exploratory scope as there were no benchmark studies to consider, for although electrification as a change is currently happening, it has scarcely been studied as a pro-environmental change. Therefore, the exploratory nature and the case study structure of this thesis can be considered

as a methodological novelty in the field of pro-environmental change and electrification research. This approach will thus provide added value to the current research approaches since the exploratory and qualitative case study structure has the potential to capture human experience, perception, fear, and uncertainty in changing work environments in the German automotive industry.

3.3.4 Ensuring rigour and consistency

The main critique of qualitative studies addressing pro-environmental change states that applying a qualitative research approach does not necessarily ensure rigour and consistency since the research quality is strongly dependent on the researcher's skills (Anderson, 2010). Thus, the consistency of qualitative research approaches has historically been questioned, and concerns regarding the quality and validity of qualitative research have been raised (Carroll & Swatman, 2000). The current section will thus outline which measures were taken to ensure rigour and consistency for this thesis.

Rigour is generally described as a process in which a researcher ensures that pre-defined procedures are used to ensure that the conduct of research is not based on a biased or idiosyncratic approach. To ensure rigour and consistency for this thesis, a research approach was designed which applied qualitative research measures in which rigorous steps were incorporated to ensure reliability. These steps further ensured the potential for replicability and were thus aligned with traditional research philosophy and practice and were not idiosyncratic. However, as previous studies have stated, qualitative research practices are prone to being influenced by the researcher's subjectivity, and therefore rigour is considered '[...] as the strength of the research design and the appropriateness of the method to answer the questions. It is expected that qualitative studies are conducted with extreme rigor because of the potential of subjectivity that is inherent in this type of research' (Cypress, 2017, p.254). Johnson et al. (2020) and Whittemore et al. (2001) have presented fundamental steps that qualitative researchers can apply when conducting qualitative research with the aim of ensuring rigour and consistency. For instance, qualitative research can provide rigorous research processes when giving a rationale for consistent sampling design decisions, determination of data saturation, research ethics, member sampling, prolonged engagement with study participants, and triangulation of data sources (Johnson et al., 2020; Whittemore et al., 2001). All of these steps were applied in this thesis in order to ensure a replicable and rigorous research approach.

Other studies have put much emphasis on the rigour versus relevance debate, in which researchers ask the question of whether qualitative studies should follow rigour and consistent study design or put more emphasis on the practical relevance of their findings (Cypress, 2017; Gioia et al., 2013; Simon, 2004; Straub & Ang, 2011). However, in order to be able to derive practical implications for automotive companies from this thesis, the focus on rigour and the application of consistent conduct was considered as an appropriate step for eventually deriving practical implications. The perceptions and experiences of the participants must be studied thoroughly and consistently to obtain a broader understanding of participant perceptions in automotive companies, which can be helpful for other companies in the German automotive industry.

By presenting related literature in the introduction to this section (Johnson et al., 2020; Whitemore et al., 2001), it was outlined how the rigour and consistency of qualitative research can be ensured. Other researchers focusing on rigour and consistency have also concluded that the primary focus should be on several criteria that need to be ensured by qualitative researchers to achieve rigour (Anderson, 2017; Ashworth et al., 2019; Harley & Cornelissen, 2020; Johnson et al., 2020; Smith & McGannon, 2018; Whitemore et al., 2001),

- The rationale for consistent sampling design decisions
- Determination of data saturation
- Research ethics
- Member sampling
- Prolonged engagement with study participants
- Triangulation of data sources
- Paradigmatic/theoretical positioning
- Peer debriefing

3.4 Choosing the research sites: Selection criteria and nature of access to automotive companies

This current section will present the selection criteria for the research sites, which companies gave their consent to participate in this research project and how the nature of access influenced this thesis' final research design.

3.4.1 Geographical selection criteria for automotive companies in Germany

For this study to present an evidence-based insight into the impact of electrification on the German automotive industry and the participants' perceptions, suitable companies had to be chosen that would provide an insight into the impact of electrification on the individual companies as well as on the whole automotive industry. This current section will therefore discuss in which geographical regions of Germany automotive companies have settled and how this influenced the selection for the data gathering.

In 2020, a total of 968 automotive companies, including Original Equipment Manufacturers (OEM) as well as supplier companies, were based in Germany (Statista, 2021). Narrowing this further down, about half (54) of the 100 most important automotive companies were located in just 3 of the 16 German States: Hesse, Bavaria and Baden-Wuerttemberg, which are all in the south of Germany (Meyer-Industry-Research, 2018). Moreover, 41 of the 100 most important companies were located in the state of Baden-Wuerttemberg alone (Meyer-Industry-Research, 2018). In this context, 'most important' means that these companies have the highest revenues and produce parts which are mandatory to construct an ICE combustion engine and make a car move (Meyer Industry Research, 2018). In 2020, 808,935 people were employed in the automotive sector (Statista, 2021). Out of these 808,935 people, 203,000 were employed in automotive companies located in Baden-Wuerttemberg alone (Automotive-BW, 2020). Thus, Baden-Wuerttemberg can be regarded as the powerhouse of the German automotive industry and of the international automotive industry, since automotive companies from Baden-Württemberg alone generate one-fifth of the world's automotive revenue (Automotive-BW, 2020). Based on these criteria, this study was set in the geographical South-West of Germany, where the federal state of Baden-Wuerttemberg is located. Considering electrification in

particular, any changes and impacts on automotive companies that result from electrification will most drastically be felt by the companies and people who reside there.

3.4.2 Selected research sites and applied selection process

After the location of suitable automotive companies had been narrowed down to the area of South-West Germany because of the companies' local significance for the economy, further selection criteria were defined to identify those automotive companies that should eventually be visited for the data collection.

The main selection criteria for automotive companies to participate in this study were the possible impact of electrification on their products as well as the impact of electrification on their workforce and employees. Through the direct impact of electrification on the industry and its workforce, an understanding of the importance of electrification and the severity of its impact on individuals and entire departments can be obtained. As there were not many automotive companies with a fully electrified product range, the number of potential companies that could have been visited was extensive. To make a clear representation of electrification in automotive companies, it was decided to contact the largest OEMs and supplier companies in South-West Germany. The chosen companies were further categorised by revenue, influence, and employment numbers, since companies with the largest number of employees and influence will shape the future of the automotive industry as well as the future of global mobility itself. Moreover, to paint a clear picture of electrification's impact on the automotive industry, access to OEMs as well as to automotive supplier companies was required. Both branches work hand in hand and are equally impacted by electrification, but to show differences and similarities between OEMs and suppliers, only access to both types of companies would allow this thesis to consider the impact of electrification on the automotive industry thoroughly.

Therefore, three OEMs in South-West Germany were contacted with a request for data collection to take place at their sites. To obtain access to the companies, the consent of the management as well as the consent of the work council was required. Of the three contacted OEMs, two denied access, whereas the third accepted. Since OEMs in South-West Germany have very similar internal organisational structures, products and production processes, the impact of electrification on those OEMs will be very similar, as will electrification's impact on OEMs in the rest of the world; the shift towards electrification is a requirement all OEMs and

supplier companies will have to fulfil eventually, so production processes and consequently workforces will have to adapt accordingly as well.

In comparison to OEMs, automotive supplier companies have specialised in specific products and car parts that they produce and sell to OEMs. Some suppliers focus on the production of engine specific parts like pistons, gear boxes, bushing bearings and valves, products which will be heavily impacted and restricted by electrification. Other suppliers focus on the production of air conditioning systems, light systems, driving assistance software, air filters and batteries, products which will still be used in electric cars and after electrification. It was found that most big supplier companies produce both products that will be heavily impacted by electrification and products that will be impacted less by this change.

To conduct data collection at supplier companies, the 20 biggest automotive supplier companies by revenue, product range and employee numbers were contacted. Out of the 20 supplier companies contacted, five companies answered and granted permission for qualitative data collection process to take place at their sites. However, only two of these five companies allowed access to their employees for any sort of empirical data collection process; the other three companies did not pass this request on to their work councils, which meant that only their managers or staff with leadership tasks could be considered for data collection. Table 1⁹ shows an overview of the five contacted supplier companies, their main business and the extent to which they granted access for qualitative data collection at their sites.

3.5 Establishing a research design: Applying a case study methodology

Section 3.4 has presented this thesis' process of gaining access to automotive companies to collect qualitative data. The research design was strongly influenced by the nature of access that was granted by the companies, and many adjustments had to be made to organise a rigorous qualitative research design that could take place at the automotive companies. However, the nature of access was not the only reason for choosing this thesis' study design; many other factors played an important role during this process. The rationale behind the ultimate choice of the research design shall therefore be discussed in this current section.

⁹ See Table 1 in Appendix A of the Appendices for all contacted automotive companies

3.5.1 Nature of access influencing study design

When considering the nature of access granted by the companies, it should be noted that it was advantageous to obtain full access to three automotive companies and partial access to another three supplier companies. The three supplier companies which granted partial access stressed the fact that qualitative research could only be conducted with managers at their sites. All companies who granted any form of access were structured alphabetically by giving the letter A(lbert) to the company that replied first and F(riedrich) to the company that replied last to the request. Table 2¹⁰ shows all companies in alphabetical order based on the time of their responses.

Initially, Company Albert granted full access which meant that the work council and the management allowed access to study employees and managers. However, upon arrival at Company Albert's premises on the day the study commenced, the work council had withdrawn its consent to interview Company Albert's employees for this research project. Company Albert remained as a case study object since their permission to access internal company documents and observations was not withdrawn and thus the incorporation of Company Albert in the case study structure provided more advantages than incorporating a Company that would not allow access to on-site observations and company documents.

Based on the nature of access and the overarching goal of this thesis, a case study structure was applied since this research approach was considered able to yield the most extensive and reliable data as the companies could be closely examined and compared. A case study structure is useful when considering the differences and similarities between automotive companies, especially when trying to understand how they communicate and manage electrification as a change. However, applying a case study structure requires much planning and organisation of study objects and research participants. Therefore, this current section shall discuss how this thesis' case study structure was defined, how this approach helped in answering the research questions, and what advantages and disadvantages are inherent to case study designs.

¹⁰ See Table 2 in Appendix A of the Appendices for full and partial access granted by automotive companies

3.5.2 Introduction to this thesis' case study design

While the nature of access to the automotive companies played a role in the adoption of a case study design for this thesis, other factors regarding the reliability and representativeness of case study designs were also considered and ultimately led to the adoption of this research approach. Section 3.4 of this chapter has already outlined the selection criteria for automotive companies. Therefore, this current section will primarily focus on describing how these access-granting companies were organised in a case study design and subsequently as case study objects. Furthermore, this section will present why this specific research design was considered as suitable and what advantages and disadvantages regarding its reliability, representativeness and generalisability were considered by the research.

Case studies can be understood as studies that focus on a certain topic by considering a condensed sample of actors and organisations that are experiencing a broader phenomenon (Gerring, 2004). In the case of this thesis, the broader phenomenon can be understood as electrification itself, which constitutes a pressing change in automotive companies, and the condensed sample is represented by the companies that have granted access to their sites. To outline the main characteristics and the nature of a case study, Ylikoski and Zahle (2019) conducted an extensive literature review and concluded that there are five main characteristics that make case study designs distinct from other research approaches,

1. The focus of study is a single case or a handful of cases at most.
2. The case is a naturally occurring item or process that is conceptualised as a case of something.
3. The case is studied intensively: the case study researcher collects a lot of data about the case rather than generating very specific kinds of data about multiple cases.
4. The case is studied using multiple methods: as part of the intensive focus, a case study researcher usually employs multiple methods of data collection and analysis. The research is not method-driven, but question-driven.

5. The goal of a case study is to produce a comprehensive in-depth account of the case. The account is often presented in a narrative form.

(Ylikoski & Zahle, 2019, p.1).

Yin (2009a) summarised that case studies are used when the boundaries between phenomenon and context are not perfectly clear, which would make this research method particularly suitable for investigating contemporary phenomena in real-life contexts by using multiple sources of evidence. It must be stated that Yin was exclusively using case studies in quantitative research and thus had an ontological standpoint different from this thesis' approach. However, there are little to no differences when considering the mere structure and general approach of qualitative and quantitative case studies. While qualitative and quantitative case studies differ in their epistemological and ontological standpoints, as well as in the applied methods, the core structure of this research approach and its basic requirements regarding its extensive consideration of a few cases and its in-depth scope of the conducted research remain similar (Platt, 1992). Moreover, Platt (1992) proposed that the lines between qualitative and quantitative dichotomy become blurred since case studies want to offer a 'snapshot' of a real-life study setting which undermines the overall hard distinction between qualitative and quantitative studies. However, there are case study approaches such as longitudinal case studies where more than a snapshot of a current situation is presented. In longitudinal case studies, the development of the case study objects over a longer time frame are at the centre of attention (Cook et al., 2004; Kiely, 2005; Street & Ward, 2012). Opposite to longitudinal case study approaches, this thesis applied an explorative focus where the case study objects and the opinions, experiences and feelings of the study participants were in the centre of attention.

This section can be concluded by stating that case studies are a research approach which consider a small number of cases in a real-life environment and address a specific research topic or phenomenon. Moreover, case studies require an in-depth focus and study the cases extensively by applying multiple research methods at each research site (Elman et al., 2016; Gerring, 2004, 2007; Ylikoski & Zahle, 2019). Based on this definition, the following sections shall present answers as to why a case study design was considered the most suitable research approach for this project.

3.5.3 Advantages and disadvantages of using a case study design

Section 3.5 has so far introduced the general approach to case study research and has also presented an insight into the fundamental mechanics of case study designs. The final research design of this thesis was chosen based on how many cases had to be considered, what specific research methods had to be used and whether the collected data would yield robust, reliable, and generalisable findings. To answer these questions, the literature on case study design which discusses its advantages and disadvantages was consulted.

Case studies are often not theory-driven compared to other research approaches. Case studies are described as considering specific cases without applying an overarching theory or theoretical model which guides the overall research goal (Ylikoski & Zahle, 2019). In the case of this thesis, the characteristics inherent to case study structures were considered very helpful. Electrification and the connected participants' perceptions of electrification were perceived as emergent and fluid concepts, which were met with an open scope that was applied using a case study structure. Thus, this thesis' case study structure used an explorative approach to derive an understanding from the participants' experiences and perceptions of electrification. Consequently, the chosen explorative research approach rather puts the focus on either persons, groups, or entire units to generate this study's findings and to establish an understanding of the study objects themselves (Gustafsson, 2017). Regarding the validity and generalisability of data it can be stated that case studies use data triangulation between methods and the considered case study objects. This process is employed for this thesis, and as mentioned in Section 3.3.4, triangulation ensures rigour and consistency for the research process and the collected data (Anderson, 2017; Ashworth et al., 2019; Harley & Cornelissen, 2020; Johnson et al., 2020; Smith & McGannon, 2018; Whittemore et al., 2001). Secondly, Gerring (2007) stated that a case study's validity must be considered from two perspectives, the internal and external perspectives of the study. In the case of this study, the external perspective is represented by the unstudied population of automotive companies in Germany. Therefore, a case study structure could suffer from the problem of not being representative of all automotive companies when only a small sample is considered (Gerring, 2007). However, the case study objects were studied in-depth which means that a trade-off between external and internal validity happens when studying a small sample (Elman et al., 2016; Gerring, 2007). An in-depth or internal perspective of a smaller sample can always be studied more thoroughly than a bigger population, so a more detailed insight into the selected cases can be obtained (Ylikoski & Zahle,

2019). In this context, case studies can be ‘[...] particularly useful to employ when there is a need to obtain an in-depth appreciation of an issue, event, or phenomenon of interest, in its natural real-life context’ (Crowe et al., 2011, p.1). Based on these characteristics, a case study structure was perceived as able to yield the richest data when considering the companies by applying an in-depth case study structure.

Moreover, a small sample of selected cases, which is an inherent characteristic of case study structures, can still yield valid findings regarding the impact of electrification on other automotive companies in Germany. As the literature review of this thesis has established, all automotive companies in Germany are impacted similarly by electrification since this change originates outside the companies and the extent to which the changes must be adopted are often legally predefined by the government in the form of CO₂ reduction plans. These dictate specific actions to automotive companies in Germany since CO₂ reduction numbers are easily measured by governing bodies, thus requiring similar actions across the whole industry.

The application of a case study structure to study the cases was not considered sufficient to generalise the findings to all automotive companies in Germany. Some aspects of this study on the application of communication strategies regarding electrification were considered as partially generalisable because of the nature of electrification itself and its imposed and predefined character originating from government decisions. As mentioned above, automotive companies’ staff perceptions of electrification were considered ungeneralisable and inherent to each company. As a result, this study could still draw conclusions on the general perceptions of employees across the studied companies, but it would be difficult to generalise perceptions that were taken from a small sample and project them on the whole industry.

3.5.4 Rationale for choosing a multiple case study structure

While the nature of access to the companies played an important role in the formulation of a multiple case study, further considerations had to be made to ultimately decide on the final case study structure. When designing a case study, one must differentiate between a (single or multiple) holistic or an (single or multiple) embedded case study approach.

A single holistic case study has one unit of analysis and a specific study setting, in which the case study object is considered. By contrast, single embedded case studies emerge from the

context of the study setting and have multiple embedded units of analysis (Baxter & Jack, 2008; Creswell, 2002; Gustafsson, 2017; Yin, 2011). A multiple embedded case study design has multiple contexts and multiple cases that are designed appropriately for each single context. Therefore, multiple embedded case studies consider various contexts with independent cases and use multiple embedded units of analysis inherent to each case (Yin, 2011, p.38). While the difference between a holistic and an embedded case study lies in the focus of the case study itself, the difference between a multiple and a single case study simply lies in the researcher's consideration of how many cases shall be used for the case study research (Baxter & Jack, 2008; Creswell, 2002; Gustafsson, 2017; Tellis, 1997). Thus, the main difference between the two concepts is the fact that

[...] a multiple or collective case study will allow the researcher to analyse within each setting and across settings. While a holistic case study with embedded units only considers unique/extreme/critical cases, in [...] a multiple case study, we are examining several cases to understand the similarities and differences between the cases [...] (Baxter & Jack, 2008, p.550).

One concern when using a single case study structure is the fact that there will inevitably be a lack of generalisability to the study area when only addressing one single case (Tsang et al., 2014). The collected data in a multiple case study setting provides one with the capability to generalise the data across the case study units and thus paint a clearer picture since more cases are considered (Tsang et al., 2015; Yin, 2009a; Yin, 2009b). In this context, Crowe et al. (2011) argue that using a multiple case study design '[...] involves studying multiple cases simultaneously or sequentially in an attempt to generate a still broader appreciation of a particular issue [...]' (p.9).

To formulate a case study, it was decided that the three companies granting full access to their sites (Company Albert, Company Bertha, Company Carl) were considered as the case study objects. Having access to both employees and managers meant that two groups per company were included in the initial case study design. Company Dora, Company Emil and Company Friedrich did not grant access to employees, which disqualified them as case study companies. While Company Albert withdrew the permission to study its employees at a later stage, Company Albert was kept as a case study company because, unlike with Company Dora, Company Emil and Company Friedrich, access to internal documents and permission to

conduct observations was not withdrawn by Company Albert. Based on the overview of this thesis' research approach and considering the contention of Stake (1995) and Crowe et al. (2011) that multiple objects of analysis automatically lead to a multiple case study, this thesis cannot be considered as a single case study. In comparison, Yin (2011) states that a similar study design to this thesis, where more than one research object is considered, could lead to the formulation of a single embedded case study if the context in which the study takes place (electrification as a change) is the same for each company. Adopting Yin's (2011) position would lead this study to adopt a single case study with various embedded groups, resulting in three companies and a total of six units of analysis (managers and employees in each company). Nonetheless, the situation for each automotive company was considered differently. All three companies face drastic changes and difficult tasks that emerge from electrification. Nonetheless, based on the ontological standpoint of this thesis, it must be considered that the manager and employee groups might face different realities and challenges that are provoked by electrification. These different realities and the context of each group in each company meant that Yin's (2011) reasoning for the application of a single embedded case study was not suitable for this research. Moreover, multiple case study designs allow one to apply method triangulation and data triangulation between the study objects, which was applied to provide rigour and consistency of data (Anderson, 2017; Ashworth et al., 2019; Harley & Cornelissen, 2020; Johnson et al., 2020; Smith & McGannon, 2018; Whitemore et al., 2001). Ultimately, this study used a multiple case study structure and considered the three automotive Companies Albert, Bertha and Carl with a total of six embedded groups, namely managers and employees for each company.

3.6 Data Collection

According to previous research regarding case study structures (Baxter & Jack, 2008; Crowe et al., 2011; Stake, 1995; Tellis, 1997; Yin, 2011), conducting qualitative research while applying a case study structure requires a primary and a secondary data collection process.

Primary data collection in qualitative case studies focuses on participant contact. Therefore, researchers often rely on interviews, such as telephone interviews or semi-structured interviews, e-mail discussions or focus groups, etc. (Baxter & Jack, 2008; Crowe et al., 2011; Stake, 1995; Tellis, 1997; Yin, 2011). These primary sources of data are paired or cross-examined with

secondary data sources. Secondary data is also collected on site or through other sources which can be obtained in libraries or archives. Often used sources for secondary data collection are documentation, archival records, physical artefacts, direct on-site observations and participant observations (Baxter & Jack, 2008; Crowe et al., 2011; Stake, 1995; Tellis, 1997; Yin, 2011). Sørensen et al. (1996) state that secondary data has a supporting character and is derived to compare occurrences or information derived in the primary data collection process. When conducting secondary data collection, some researchers might face problems regarding availability and access to secondary data sources. Therefore, it is often advised to use the internet and online archives to derive possible data sets which show trends or support the primary data (Atkinson & Brandolini, 2001).

Consequently, in phase one of the data collection process, secondary data were collected first, which included studying company documents and archival records. It was decided to study the secondary data first to obtain a deeper understanding of the research matter and the companies themselves. The archival records, mostly government publications, included federal requirements for automotive companies to improve their current environmental impact. The considered company documents mainly stated how the automotive companies would develop a greener strategy to meet the government requirements. By viewing documents as secondary data of 'both sides', the current situations in automotive companies were considered in-depth using documents as a source of information, which allowed further preparation for the second stage of data collection, which consisted of the fieldwork in the companies in the form of semi-structured interviews.

3.6.1 Phase 1: Secondary data collection

This current section shall describe how the secondary data collection process was approached and how the collected secondary data was used to solidify the understanding of electrification and its impact on automotive companies.

Previous studies addressing the application of case study methods have offered a detailed overview of what secondary data are and what they can be used for (Arzuaga, 2014; Smith, 2008, 2011). Secondary data can generally be understood as data not generated by the researcher but taken from other sources to save time, money, and resources. Furthermore, secondary data is often taken from sources composed by multiple persons since it would be

impossible for only one person to collect or would exceed the scope or scale of any research project (Arzuaga, 2014; Smith, 2008, 2011). Moreover, the triangulation of secondary and primary data ultimately ensures rigour and consistency of data (Anderson, 2017; Ashworth et al., 2019; Harley & Cornelissen, 2020; Johnson et al., 2020; Smith & McGannon, 2018; Whitemore et al., 2001). While secondary data according to Arzuaga (2014) and Smith (2008, 2011) must be a set of data which is acquired through other sources or composed by several researchers, Yin (2009a) has categorised secondary data in case study research as six different types of data sources, which can seem contradictory to the definition of secondary data presented above,

1. Documentation
2. Archival records
3. Interviews
4. Direct observation
5. Participant observation
6. Physical artefacts

As mentioned above in Section 3.5, Yin has contributed much knowledge to the field of case study research. Yin (2009a) assumed a different ontological standpoint from the one taken in this study. This ultimately raised the question to what extent his proposed research approach regarding secondary data could be used for this thesis. While Yin predominantly conducted studies using quantitative research approaches, using secondary data does not require a researcher to actively apply either a quantitative or a qualitative research approach, as also stated in the introduction to this current section, referring to Arzuaga (2014) and Smith (2008, 2011). Considering researchers who have conducted qualitative studies, such as Stake (1995) for example, it becomes evident that the scope of consideration of secondary data does not vary between quantitative case study researchers and qualitative case study researchers,

1. Observation
2. Interview and documentation
3. Document review (internal documents or company-/state-published documents)
(Stake, 1995)

In conventional qualitative studies, observations are often considered primary data. For this thesis, observations at the companies were considered secondary data. This contradicts the definition of secondary data made by Arzuaga (2014) and Smith (2008), but the main source of primary data for this thesis was semi-structured interviews (SSIs). Additionally, observations and internal company documents were used to support the interview data, Thus, based on their supporting character, observations were considered secondary data for this thesis.

Based on the similarities between quantitative and qualitative case study research regarding the collection of secondary data, the first phase of the data collection involved reviewing company documents and state-published documents to gain a deeper understanding of the changes constituted by electrification as a pro-environmental change. For each of the three case study companies, two annual reports, namely the sustainability and annual business performance reviews, formed the basis of analysis. In these documents, the companies report on their development regarding the implementation and production of electrified products. For each company, the respective documents from 2017 through 2020 were considered, which means that in total 24 company documents were reviewed and used as a secondary data source. The state-issued documents reviewed for the secondary data analysis were published by the German Federal Ministry for Economic Affairs and Energy and focused specifically on the development of electrification in the automotive sector. State issued documents that did not contain any company names were also cited in Chapter 1 and Chapter 2. In total, four state-issued reports from 2017 through 2020 were reviewed and used for the secondary data analysis. However, to protect the anonymity of the case study companies, none of the reports can be attached to this thesis because names and locations of the companies are stated in the respective state-issued and company reports.

In addition to reviewing company and federal documents, this research undertook on-site observations regarding pro-environmental changes implemented in companies' workspaces, production plants and buildings. Moreover, new company products and new production processes were observed on site, insofar as they emerged in the companies as an answer to the demands of electrification.

3.6.2 Phase 2: Primary data collection using semi-structured interviews

In the second phase of data collection 41 semi structured interviews (SSIs) at the three case study sites were conducted. At Company Albert, nine interviews with managers were held. At Company Bertha, it was possible to conduct 13 interviews with employees and three interviews with managers. Lastly, Company Carl, permitted six manager interviews and six employee interviews. What becomes apparent is that no interviews with employees were conducted at Company Albert and that only three interviews with managers were conducted at Company Bertha. This can be explained by the fact that Company Albert withdrew its work council agreement to access employees at short notice, to protect their privacy, whereas the HR department at Company Bertha changed its mind as it felt uncomfortable at the thought of a great number of their managers giving interviews regarding the strategic positioning of Company Bertha. Since a work council agreement was required to access employee participants for interviews, there was no opportunity to balance the loss of Company Albert's employee group. Through the newly emerged additional capacities caused by the loss of manager participants at Company Bertha, interviews with managers at Companies Dora, Emil and Friedrich were conducted as a control mechanism for the management viewpoint. A full list providing an overview of all conducted interviews can be found in Appendix B¹¹.

3.6.3 Semi-Structured Interviews

After having extensively reviewed the literature on qualitative research techniques, SSIs were chosen as the primary data collection method for this thesis and were thus used in the second phase of the data collection (Fontana & Frey, 1994; Guion et al., 2001; Hennink et al., 2010; Hermanowicz, 2002; Kvale, 1996; Ritchie et al., 2013).

SSIs were applied because their inherent characteristics were perceived to precisely meet this thesis' research needs. By employing SSIs, an intimate understanding of the participants' social worlds was obtained as well as an insight into their work environments. Moreover, this research method allowed exploration of the participants' feelings and perceptions towards electrification and its communication in a private environment (Hermanowicz, 2002; Ritchie et al., 2013). SSIs allowed the participants to speak freely and openly about their perceptions and experiences

¹¹ See Figure 17 in Appendix B of the Appendices for numerically listed interviews

regarding electrification and its impact on their professional and private lives. As the interviews were conducted in personal and secure environments and not, for instance, in focus-group settings, the interviewees were not afraid to talk freely.

While planning the data collection process, electrification was perceived as a topic that could potentially be sensitive for some participants since their positions in the automotive companies might be threatened by this change. To still obtain the richest qualitative data possible, a calming atmosphere that allowed the participants to speak freely had to be created. SSIs were thus also considered as the most suitable research method since they allowed exploration in a face-to-face setting of ‘[...] how people make decisions; people’s own beliefs and perceptions; the motivation for certain behaviour; the meaning people attach to experiences; people’s feelings and emotions; the personal story or biography of a participant; in-depth information on sensitive issues; the context surrounding people’s lives [...]’ (Hennink et al., 2010, p.133).

3.6.4 Ethical considerations

To provide the highest ethical standard, the literature on qualitative research ethics was reviewed. For the interviewing process, Graham et al. (2007) proposed requirements to conduct ethical qualitative research which were taken as a guiding example for this thesis. The steps are shown in detail in Appendix A¹².

Following the ethical principles derived from the literature, the design of this study was carefully prepared. To resolve all confidentiality issues and provide for the participants’ autonomy (Orb et al., 2001; Ramos, 1989), it had to be ensured that this research undertook no legal violations against German labour law. Furthermore, to obtain informed consent (Ramos, 1989; Richards & Schwartz, 2002), the participants themselves expressed their consent separately. A participation agreement for this research was made individually with each participant to ensure that no pressure from any executive was exerted on the participants to participate in this study. It was also imperative to provide confidentiality for the participants and their data (Orb et al., 2001; Richards & Schwarz, 2002). These decisions were motivated by the University’s ethical requirements and by the EU law for data protection which also

¹² See Table 3 in Appendix A of the Appendices for the Ethics in Social Research: The views of research participants (Graham et al., 2007, p.6)

dictates under the general data protection regulation (GDPR, 2018) that ‘[...] personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes.’ (GDPR, 2018). This is the case for this study since the collected data will only be kept for future research purposes. The GDPR (2018) indicates that data stored under these circumstances (scientific research) can be stored for an extended period. Therefore, storing the data (recordings and transcripts) and the participants’ consent forms for a period of seven years was considered as adequate since companies and their personnel often change, for instance, due to retirement or normal personnel fluctuation at the workplace. It was also guaranteed to all study participants and their respective organisations that it was possible for them to withdraw from this study within a two-year timespan until May 2020. This information and any other possible ethics-related questions were given to the participants in written form as a debriefing sheet which can be found in Appendix B. However, none of the interviewed participants raised concerns or wanted to withdraw from the study after the data collection process was finished. The collected data will be destroyed professionally according to German and European law in Stuttgart’s City Hall. All research ethics documents that were issued by the University can also be found in Appendix B, including the approved ethical application for this thesis¹³.

3.6.5 Participant identification and selection

All three companies are multinational corporations (MNCs) with numerous business units, strategic units, and departments. The contact persons in the companies supported the research by referring study participants from departments directly impacted by electrification. Thus, most of the chosen participants were from technological and engineering departments since those departments were directly and most severely impacted by electrification. Other participants who were not part of technological departments were employed in departments closely linked to the companies’ products, such as procurement, quality control, sales etc. Having a supporting function to technological departments, these departments were similarly impacted by electrification. To gain a perspective on the strategic response of the companies to electrification, the respective heads or managers of the technological departments were interviewed, too. This allowed the researcher to ultimately obtain an understanding of the

¹³ See Figure 10, 14,15, and 16 in Appendix B of the Appendices for university approved Ethical clearance documents presented to the companies

employees' perceptions of electrification as a change as well as the managers' perceptions and strategic responses towards electrification. During the data collection in all three companies, the HR departments always supported this thesis and thus helped to identify suitable interviewees. Ultimately, however, the interview appointments were booked personally with the participants to maintain their anonymity.

3.6.6 Contacting potential interviewees

Fifty potential employee and manager interviewees from the companies were contacted via email¹⁴. Most contacted persons responded positively to the interview requests. If an immediate response was not received, a follow-up email was subsequently sent. All interviewees who did not initially respond to the first email ultimately responded positively to the follow-up request sent by either the researcher or the contact persons in the companies' HR departments. Additionally, signature of a non-disclosure agreement (NDA) was requested by all companies. Only after signing the NDA were the HR departments able to help the researcher to contact potential interviewees and maintain their anonymity. However, in only two cases the HR departments of the companies had to send reminders to potential interviewees, which were then ultimately accepted. As mentioned above, all manager interviewees and most employee interviewees responded positively to the interview requests. This can be explained by the fact that almost all potential interviewees expressed their interest in the topic of the study and wanted to contribute to this thesis with their experiences.

3.6.7 Conducting the interviews

The email request sent to all potential interviewees stated that the duration of the interviews would take approximately 60 minutes. Depending on the engagement of the interview participant, the duration of the conducted interviews ranged between 45 minutes and one hour and fifteen minutes per interview; in cases exceeding 60 minutes the interviewees agreed to continue with the interviews. Most of the interviews (38) were held in German. Three interviews, however, were conducted in English with employees who were non-native German speakers who stated that they were more comfortable speaking in English. All interviews were

¹⁴ See Figure 13 in Appendix B of the Appendices for letter of intent sent to companies

held at the respective companies' premises in a personal and secure environment with only the researcher and the interviewee present. All necessary measures were taken to ensure ethical conduct respecting University and GDPR regulations.

All conducted interviews followed the same guideline questions for the manager and employee groups, which can be found in Appendix B¹⁵. Those open-ended question scripts ultimately constituted a guideline for the SSIs and were derived from the identified thematic gaps in the literature review as well as from the prior consideration of secondary data in general, SSIs should have the character of a conversation between the researcher and the interviewee. During the interviewing phase of this thesis, this was often the case. The defined guideline questions were used to keep the interviewee on topic and thus allow the interview data to be relevant, comparable, and capable to answer the research questions. The interviews were electronically recorded to ensure that the collected data would be accurate and verified. A detailed report on the reflection of the chosen research method and the impact of the COVID-19 pandemic on the research activities are presented in Appendix B¹⁶.

3.6.8 Transcription of the interviews and translation methodology

To ensure a rigorous, accurate and systematic transcription process, previous research on transcription was considered and applied in this study (Azevedo et al., 2017; McLellan et al., 2003). A rigorous analysis of the interviews included the application of the same transcription process for each interview. The electronic recording was always uploaded to a transcription software called T5 (T4 for Windows). This software was used to transcribe the interview recordings. This software provided essential keyboard shortcuts and a self-explanatory interface in line with the proposed guidelines of the previously considered research regarding the transcription process. At the beginning of the transcription process, a total of five interviews were sent to a professional transcription service that ensured GDPR security. They were later used as reference documents. Additionally, a professional transcriber was contacted who provided all necessary information to ensure a rigorous and accurate transcription process. The collected interviews were ultimately transcribed by the researcher, thoroughly complying with

¹⁵ See Figure 11 and 12 in Appendix B of the Appendices for the translated manager and employee interview guideline questions

¹⁶ See Figure 19 and 20 in Appendix B of the Appendices for the impact of COVID-19 on the research activity and a reflection on the chosen research approach

the guidelines offered by Azevedo et al. (2017) and McLellan et al. (2003), the templates of a professional transcriber and the sample interviews of the transcription service company.

Another important aspect that had to be considered was the process applied to translate the German interviews into English after they had been transcribed. To apply a rigorous translation process, the literature on translation methodology was considered and its guiding principles were ultimately applied for the translation processes in this thesis (Al-Amer et al., 2015; Esfehiani & Walters, 2018; Holmes et al., 2013; Jagosh & Boudreau, 2009; Sperber et al., 1994). The translation theory applied in this thesis constituted a back-translation approach based on previous research describing this translation process for qualitative studies (Brislin et al., 1973; Jagosh & Boudreau, 2009; Werner & Campbell, 1970). In the first step, the passages of the German interviews used for the data analysis were translated into English. In the second step, the passages were translated back into German to detect language discrepancies that would have led to an inaccurate presentation of interview passages based on wrong translation.

3.7 Data Analysis

3.7.1 Procedure applied to analyse primary qualitative data

To analyse the transcribed interviews, an analysis and coding process had to be applied to derive meaning, trends, and similarities from the interviews. To aid this process, the qualitative analysis software NVivo was used, which allows researchers to upload transcribed interviews and subsequently code and analyse them. The coding and transcription of the interviews in NVivo requires the creation of nodes. In a coding process, nodes can be understood as thematic categories or headings into which interview passages can be copied. For this study, 170 nodes were established in NVivo that emerged partly from the interview structure and partly from reoccurring themes established by the participants' answers to the questions. As the interviews were semi-structured, certain topics could reoccur in interviews but at different stages. Therefore, an electronic programme that supported the coding and analysis process was viewed as immensely helpful. Almost all the interviews, however, had a surprisingly similar dynamic and structure and thus revealed rather clear themes which were used to establish the nodes in

NVivo accordingly. The 170 nodes were distributed among nine overarching topics reflecting the interview structure and the structure of the interviewees' responses.

3.7.2 Applied coding strategy

The coding strategy applied to ultimately analyse this thesis' collected primary data was based on the theoretical approach of qualitative content analysis (Benbunan-Fich et al., 2003; Kohlbacher, 2006; Mayring, 2014; Schreier, 2014). Researchers who undertake qualitative content analysis follow similar steps, allowing them to continuously condense data until a theme or finding is determined that allows cross-comparison of data between research participants. An extensive literature review regarding the coding process was undertaken, which showed that previous studies adopting qualitative content approaches applied similar coding methods (Bengtsson, 2016; Elo & Kyngäs, 2008; Erlingsson & Brysiewicz, 2017; Graneheim & Lundman, 2004; Mayring, 2014; O'Connor & Gibson, 2003; Schreier, 2014). Six vital steps were derived from these coding processes that must be applied to code the transcribed interviews and ultimately condense the qualitative data to derive meaning units that can be analysed and cross-compared. Thus, two separate processes must be considered; firstly, the structuring process which is composed of three distinct steps that ultimately yield coded data for analysis,

1. Create overarching topics ('meaning units') (Schreier, 2014, p.24f.; Erlingsson & Brysiewicz, 2017, p.94)
2. Create first node-categories from theories and interview structure ('condensed meaning units' = 'node') (Erlingsson & Brysiewicz, 2017, p.94)
3. Assign interview passages to established nodes ('code')

Secondly, after the codes were created, qualitative analysis must follow which again categorises the codes and establishes (reoccurring) themes. The results of this process can be seen in Chapter Four. Ultimately, Chapter Five analyses and cross-compares the findings,

4. Establishing a categorisation of the coded data ('category') (Elo & Kyngäs, 2008, p.110; Mayring, 2014, p.5)
5. Create themes from categories ('themes') (Elo & Kyngäs, 2008, p.110; Erlingsson & Brysiewicz, 2017, p.94; Schreier, 2014, p.24f.)

6. Analyse, interpret and cross-compare data ('further analysis and finding presentation') (Bengtsson, 2016; O'Connor & Gibson, 2003, Schreier, 2014)

3.7.2.1 Step one: Creating meaning units

The creation of meaning units can be understood as applying labels to which extensive passages from the interview are assigned.

3.7.2.2 Step two: Creating condensed meaning units/nodes

The creation of condensed meaning units aims to further subcategorise the meaning units created in the first step. The overarching goal is that the created condensed meaning units which are called nodes, reflect the content of the interview passages.

After the meaning units had been created along the transcripts' structure, the sub-categorical nodes were created through reoccurring topics in the interviews. For example, one node was named 'perception of pro-environmental measures'. Since many interviewees talked about this specific topic, a node was created, and every reoccurring mention was coded to it. An overview of all created nodes can be found in Appendix B ¹⁷.

3.7.2.3 Step three: Establishing codes

Specific and reoccurring topics that can be exclusively assigned to pre-defined nodes constitute the coded interview passages. Precise passages from an interview regarding a certain topic were identified that reflected the thematic content of the distilled interview passage. These interview passages or codes were then assigned to themes and categories in the following step.

3.7.2.4 Step four & step five: Creating categories and themes

In steps four and five the established condensed meaning units from step two and the deduced codes from step three were used to create themes and overarching categories from which the interview findings could be deduced.

¹⁷ See Figure 18 in Appendix B of the Appendices for the initially derived coding list

Figure 2¹⁸ shows how many pieces of coded text were attributed to the created nodes and node categories. Furthermore, the figure is built from different tiles: the bigger the tile, the more codes were attributed to the contained nodes. It is apparent that the tiles representing the overarching categories or nodes, namely (Encouragement of) Pro-Environmental Behaviour (PEB) and Electrification, and Change Communication, were the biggest since the interviews were targeting those topics. ‘Perception and Reaction to changes [regarding PEB and Electrification]’ and ‘Employee Motivation [regarding PEB and Electrification]’ were also identified as main categories, meaning they were of high priority to the interviewees. Thus, several tiles of one colour form one category.

3.7.2.5 Step six: Further analysis and presentation of findings

The subsequent analysis of the coded interviews was oriented on the created node themes and thematic categories which can be found in Figure 2. The main findings derived from the interviews were presented in a case study report. Since this thesis used a case study structure, the analysis of data had to ultimately follow a proposed structure that allowed the researcher to further apply mechanisms of case study research to present a coherent data collection and data analysis process. Therefore, a further description of the analysis and presentation of the collected data will be described in Section 3.8 below.

3.8 The case study report

Section 3.7 has presented the approach used to code the interviews and described how essential information from the interviews was deduced, this current section shall discuss how the findings were organised, analysed, and presented. Moreover, it was established that a multiple case study design would be the most suitable approach for this study when planning and organising the research process. Therefore, an appropriate case study report had to be created to present the findings in accordance with a multiple case study design.

¹⁸ See Figure 2 in Appendix A of the Appendices for an overview of the theme structure

3.8.1 Structuring the case study report

In general, a case study report can be understood as the last step of the composition of a case study, in which the findings of the study are presented and subsequently discussed (Yin, 2009a). Before the case study report for this thesis was composed, a choice between two general approaches to case study reports had to be made. Either a case-related or theme-related case study report could have been used. A case-related report considers the findings of each case study object individually and is thus structured linearly, presenting each case study object individually. In contrast, a theme-related report does not consider the specific findings of each case study object individually. This approach uses themes or other units of analysis to directly compare the individual findings from each case study object. While a case-related report only shows the findings for each case study object individually without comparing the findings, a theme-related case study report can highlight similarities and differences between case study objects.

When considering the difference between case-related or theme-related case study reports, the main question is whether the case study objects must be considered as the main units of analysis or rather the emerging and overarching themes that transpired during data collection. In the former case, a linear procedure is required, which subsequently leads to a separate conclusion for each of the case study objects without cross-comparing them (Yin, 2009a). In the latter case, cross-case analysis is required to present how the emergent themes impact each case study object (Yin, 2009a). This approach allows cross-comparison of the findings directly from the different case study objects while answering the proposed research questions and considering the responses to each specific question of every single case study object (Yin, 2009a). Specific examples of these case study reports were mentioned by Yin (2011), who considered a study by Kaufman (1981) and the National Commission on Neighborhoods (1979) report as examples of case study reports not focusing on specific findings of each case study object but using question-and-answer-based themes as the units of analysis. This thesis also applied a theme-based approach to structure the case study report.

3.8.2 Using a theme-based approach to structure this thesis' case study report

A theme-based approach based on the precise structure of the derived themes that emerged during the coding process described in Section 3.7 was applied to structure the case study report.

The derived thematic categories of the interview content were very similar across all case study objects and across all embedded units of analysis.

Figure 2 in Appendix A shows how the themes or thematic groups that were ultimately used to structure the case study report emerged from the interviews in all case study objects. The case study report, presented in Chapters Four and Five of this thesis, was structured along the emergent and reoccurring themes of the interviews. The identified overarching themes that were used to structure the case study report were defined as follows,

- Conventional change communication strategies in the automotive industry
 - Managers' applied strategies to communicate conventional changes
 - Employees' perception of conventional change communication practices
- Perceptions of pro-environmental changes and electrification in the automotive industry
 - Managers' perception regarding pro-environmental changes and electrification in the automotive industry
 - Employees' perception regarding pro-environmental changes and electrification in the automotive industry
- Applied communication practices and strategies to communicate pro-environmental changes and electrification in German automotive companies
 - Managers' applied communication strategies and methods to communicate pro-environmental changes and electrification
 - Employees' perceptions of the applied communication strategies and methods to communicate pro-environmental changes and electrification

These themes presented above constituted the headings or categories under which the findings were presented and under which the respective management or employee viewpoints were discussed. Moreover, the thematic structure allowed a presentation of most of the collected data from the individual case study objects and an assignment of those findings to thematic groups. This approach enabled direct cross-comparison between the case study objects (companies) and the embedded units of analysis (managers and employees) when considering the interview findings in relation to a topic or theme.

4. Chapter Four: Findings

Based on the research questions, this chapter will first consider the findings regarding the three companies' communication strategies when facing conventional changes. Subsequently, it will present the participants' perceptions of pro-environmental changes and electrification. Lastly, this chapter will address change communication regarding electrification and managers' and employees' respective perceptions of this specific change communication containing messages about measures to implement the required changes to achieve full electrification. This structure was chosen firstly to understand the companies' conventional change communication processes and how these processes might change when companies are faced with electrification. Thus, the participants' perceptions are presented in the second section of this chapter since it was expected that the general pre-existing perceptions of electrification might foreshadow the companies' communication strategies applied to communicate pro-environmental changes.

4.1 Communication of conventional changes in the automotive industry

4.1.1 Change communication process

All three companies have designed internal management processes that aid the communication of changes by providing guidelines to the communicator as to what every communication step should include and look like. During the interviews, process-based change management was mentioned by manager participants, which means that every company has its defined change management and communication process, which is applied as a guide for managers and employees during times of internal change. During the interviews, managers of all three companies were asked how they communicate changes and what processes they follow in their company when communicating with employees. The participants reported on their strategies, which appeared to be very similar for each case study object. Therefore, this study could create an overview of the change strategy processes for each case study object by using the interview data. Internal company documents were also consulted as secondary data to verify the interview findings. This thesis concluded that the interview data and the internal documents regarding the communication processes were congruent. Therefore, the internal change communication processes that are used by the companies to communicate conventional changes were derived

by this thesis. In Table 4¹⁹, the different change communication processes are presented for each company.

Managers in all three companies explained that change communication processes mostly start with kick-off events such as town hall meetings and are continued by personal and direct communication at the team level. Furthermore, managers reported not using email communication during these processes; they preferred to communicate directly, face-to-face, to answer their employees' questions and thus reduce uncertainty and fear. However, the managers added that, later in the change communication process, written communication like emails and social intranet posts are used to facilitate the change process and its communication. In some cases, depending on the change, written communication can be used as kick-off communication, in addition to town hall meetings.

Company Carl's managers reported on two possible communication strategies that are applied when communicating conventional changes to employees. The first approach is similar to the processes used in Company Albert and Bertha, where the change communication process commences with a kick-off event like a town hall meeting, which is followed by personal team communication and written communication through emails and social intranet posts. However, the second reported communication approach differs sharply from the first since it utilises the hierarchical structure to communicate changes in a top-down manner. This type of change communication was called 'waterfall' or 'cascade' communication. Interestingly, managers and employees from Company Carl reported that this alternative communication process commences with written communication like emailing and social intranet posts in which the changes are vaguely announced. After that, the top-down 'waterfall' communication starts immediately without any kick-off events, and team leaders inform employees. While talking about the communication processes of conventional changes, managers explained the underlying ideas of the processes and the importance of certain communication practices like personal and direct communication.

¹⁹ See Table 4 in Appendix A of the Appendices for the companies' identified conventional change communication processes

4.1.2 Communicating conventional changes: Using monologic and dialogic communication channels

Deriving an understanding of how conventional changes are communicated was considered necessary since regular change communication and communication of electrification might differ. Therefore, a ‘benchmark’ of conventional communication techniques, used communication channels and strategies was briefly considered in the interviews. It was found that the communication processes across the three organisations are very similar on paper. However, managers in the three companies use different communication approaches and different communication channels during the change processes, as the strategic communication process outlined in Table 4 suggests.

Managers at Company Albert, for instance, insisted that face-to-face communication was the most important communication channel to them while communicating changes. Communication channels involving written communication like emails or social intranet were valued less by the managers and were also considered dangerous when communicating changes. Because of the size of Company Albert, managers are also focused on a dialogic way of communicating with their employees during times of change, in order for employees to give their opinion and be included in the change process,

Communication on the one hand is a bilateral exchange. To say, I see that and they see that, how do we see it together: me – you and then us. Then an exchange happens. The other issue is to communicate information! So, I have the one [strategy] where I say: Yes, I need your opinion on this topic [change]. We can implement a decision criteria or things that we have now decided on choosing this way. There is an exchange. And that has to happen on a regular basis (M3 Company Albert).

Every manager at Company Albert explained that face-to-face change communication in a dialogic sense is the one channel that is preferred most. Focusing on a bilateral exchange, managers were found to look for ways to engage the employees in the change process,

Where you have the most fun is usually when you [as a communicator] can best convey something. These settings are usually smaller groups where you have between 10 and 20 people at the maximum, and there you can also enter a dialogue. This exchange where

it just goes back and forth a bit, but where you can still convey your message. I think this is the most effective channel because it is the most sustainable from my point of view. Because you meet to discuss this personally (M1 Company Albert).

Company Albert primarily applies these dialogic communication methods in order for its employees to be part of an exchange. Company Albert, as a smaller firm than Company Bertha and Company Carl, cannot allow for large conflicts during times of change. This issue regarding transparency and trust will be further discussed in Section 4.1.4 of this current chapter. Company Bertha and Company Carl are significantly larger in size than Company Albert. However, this thesis found that size is not a direct indicator of differing perceptions towards company strategy and communication practices. Thus, participants at Company Bertha and Company Carl also consider face-to-face communication valuable, but monologic channels like town hall meetings, written change communication, social intranet posts and emails do play a more prominent role in their internal change communication compared to Company Albert. Participants at Company Bertha, for instance, consider town hall meetings as a means of face-to-face communication, whereas participants of Company Albert differentiated town hall meetings from face-to-face communication as monologic and dialogic, respectively. Therefore, face-to-face communication at Company Bertha was mostly mentioned in the context of meetings or gatherings where employees are present and an announcement is made,

Direct communication, face-to-face communication. I see this in town hall meetings that have always been attended by many employees, maybe not quite 500 employees but always around 350 or something like that. And they are really well perceived, and well accepted (M10 Company Bertha).

Even when employees at Company Bertha were asked what type of communication channel they preferred during change processes, face-to-face communication was often mentioned. However, even the employees' understanding of face-to-face communication differed from other companies' participants' perceptions since they experienced face-to-face communication in meetings or during presentations, channels which are also of monologic nature,

Personally, face-to-face communication, definitely. So, having a meeting or someone talking to me or presenting me some slides. I think having someone to look at and these people (managers) usually have a nice way to talk. So, if it's higher management or if

they introduce the topic in an interesting way. So, yeah, I like when I can participate in some meetings, if I have some free time, but otherwise face-to-face definitely (E19 Company Bertha).

This difference in channel perception between Company Albert and Company Bertha shows how much more time in smaller companies can be spent in dialogic communication. In contrast to Company Albert, the channels used at Company Bertha generally do not allow for a direct exchange, and even though questions can be asked, many employees fear asking questions in meetings with many attendants,

A small circle always means that people are less inhibited to ask questions. People are less inhibited to get involved. If afterwards the question arises: Are there any questions? This is this popular theme. There are 100 people and then at the end: Are there any questions? No one raises their hand when there are 100 people in a room. Nobody wants to look like an idiot. Therefore, town hall meeting, company meeting, that's a channel to primarily make announcements (M9 Company Albert).

Similar to Company Bertha, participants at Company Carl also use more monologic communication channels to inform as many people as possible about current changes. Participants at Company Carl explained that they like to use a broad mix of channels, to reach as many employees as possible with their communication.

Bringing executives together by bringing employees together in town halls, by sharing discussions with employees, by also distributing papers or using the intranet – because we don't distribute paper anymore. From then on, we must distribute information via social media to serve as many channels as possible. Last Monday, we had a company meeting with almost 7,000 employees, and the CEO told us what is going on (M22 Company Carl).

While Company Carl tries to use as many communication channels as possible to reach many employees at the same time, the employees of Company Carl reported that internal communication often happens over social intranet or via the general email distributor of the whole company. If persons or specific teams underlie a change, communication often takes

place at short notice via virtual communication or personal communication to not give people time to spread rumours,

In other words, a lot of information is communicated over the intranet. Quite early on, too. If there are changes, people are contacted, also an email is sent that the whole company receives. And if it's an issue that affects you personally, or maybe just the team or the department, then I think that's communicated quite quickly before the rumours can spread (E17 Company Carl).

The difference in communicating changes across the three case study sites became apparent when asking managers and employees about usual procedures for communicating changes. As presented above, Company Albert uses frequent face-to-face, dialogic communication concepts that aim to involve employees in change processes and thus lower their resistance. Company Bertha and Company Carl, being much larger in size than Company Albert, use a mix of internal communication channels which are mainly designed to inform employees and allowing for less exchange and thus being monologic change communication.

4.1.3 Continuous communication during conventional change communication and employee involvement in dialogic change communication

Company Albert reported focusing on employee involvement and bilateral, dialogic communication when communicating changes, since the managers at Company Albert hope to limit the resistance of their employees through their involvement. Contrary to Company Albert, Companies Bertha and Carl did not have the time to seek dialogic one-on-one communication from the very beginning. Thus, Company Berth and Carl use monologic channels that limit dialogic communication as a first step to inform all staff. However, employees are involved in the change after the initial information phase,

So, there is not much use – that's my experience – when the management stands up and says, 'yes, we must change, the markets are changing and, we just have to go into new topics'. People hear that, but that doesn't mean anything to them. I am deeply convinced that good communication only works in smaller groups, so, uh, I say now, a maximum of 50, 60 people (M11 Company Bertha).

The involvement of the employees at Company Bertha does happen in smaller groups which allow for exchange between employees and managers, but not in a classic face-to-face manner like at Company Albert. This can again be explained by the size of Company Bertha compared to Company Albert, where efficient use of time plays a large part in all management processes, including change processes. Thus, Manager 15 summarised the philosophy of Company Bertha's change communication process by explaining that, information is conveyed in an extensive manner to all employees, who in turn are later involved in the change process in discussions which take place in smaller groups,

I mean, I'll say kick-off meeting, town hall meeting, big meeting – everyone's there. You exchange ideas with everyone, but actually the most effective thing for me was, I'll say: small homogeneous groups if possible. Sometimes, maybe even if it's quite difficult, employees who are just a bit, they are not difficult in themselves, but simply that they do not support your change, then actually talk one on one. You listen, respond to someone, perhaps the most important point to take into account, too (M15 Company Bertha).

Like Company Albert's and Company Bertha's managers, participants at Company Carl also reported that the involvement of their employees is an essential step during change communication. Like the other two companies, managers at Company Carl try to include their employees in exchanges to gain acceptance and approval for change ventures. Even though all channels are used at Company Carl at the beginning of a change process, managers later try to involve their employees in more dialogic change communication to gain acceptance and reduce possible resistance. Here managers also try to involve employees in dialogic exchange before implementing changes or decisions,

So, at the end of the day, I believe that for every change process – and that will now progress very significantly with great upheavals through digitalisation and electrification of the automotive industry – I think it is very important that you integrate employees into this process and take them with you. So, you not only say: 'I communicate that there are changes and then we live that', but to say, 'OK, here they are, that will come towards us and what are the consequences? And what does that mean? And what does this do for our daily work?' So, this classic, this classic concept in personnel management, to integrate the employees in change processes, as they are

now taking place in the automotive industry. This is immensely important (M17 Company Carl).

Other managers of Company Carl expressed the hope of gaining the acceptance of employees for the change venture and reducing possible resistance through employee involvement and empathy,

You always have to explain this well and justify it so that an employee can understand it. And certainly, that's always very difficult for an employee when he's done the business, which he loves, for 20 years, and now he'll have to do something different tomorrow. Then you have to make sure that the employee does not lose his connection to the company and shut mentally down, but that he remains open to new things and is ready for change. And I think it's important to take the employees with you. I think it is better to say that right from the start (M18 Company Carl).

Employees of Company Bertha and Company Carl highly value their involvement in change processes and had positive perceptions of communication channels that equally inform and involve them,

So, then it is really a good meeting to know the current state about the whole department and to take some good ideas on how to communicate the good idea of each project and yah, I think it is a really cool meeting (E11 Company Bertha).

Company Carl's managers emphasised that they try to actively involve employees in their change communication process. However, it was found that not all processes in large corporations like Company Carl work smoothly. Employees at Company Carl value the involvement of their group in change processes, but sometimes reported that their involvement happened too late, which related to negative experiences,

Generally, I think that is really good to make communication personal and to involve people in the change. Especially they should involve these people for which the change process is important. Otherwise, we learn about that simultaneously, when like 100.000 people receive an email and the employee involvement happens afterwards, that is quite bad. Or when the neighbour team receives information ten minutes before you, and then

they all give you strange looks, and you still think that everything is all right. That is quite difficult (E16 Company Carl).

Considering Table 4²⁰, it can be stated that all three companies use similar change communication processes to communicate conventional changes. However, different communication strategies and channels are used to convey change messages to employees. Company Albert, for instance, uses a dialogic approach from the very beginning where face-to-face communication between manager and employee is applied and where possible fear and resistance can be overcome via exchange. As mentioned before, Company Albert is significantly smaller than both Company Bertha and Company Carl, which means that dialogic methods can be used from the very beginning in the change process. Company Bertha and Company Carl use different communication channels, conveying a large amount of information to individuals through town hall meetings, social intranet, or internal emails. Following this initial mass communication, both companies later use dialogic channels to convey further messages to employees. Following this initial communication, both companies later use dialogic channels to convey further messages and to involve their employees.

4.1.4 Transparency and trust while communicating conventional changes

What became apparent during the interviews was that all three companies want to avoid confrontations with their employees and instead gain their acceptance for all proposed changes. Therefore, managers reported that especially trust in management and their messages must be gained. Managers at Company Albert reported that communication of changes should involve a dialogic exchange between employees and management and should also include transparency and honesty. Thus, change communication at Company Albert requires the communicator to convey messages clearly and openly,

One thing is, recipients must always have the feeling that you don't play a double-sided game, but that you are honest. This means, I'll tell you what I know, and there is not anything else I would know, and that I do not tell you because it might frighten you. So, there has to be a certain sincerity, just trust on both sides, that you have to work on in

²⁰ See Table 4 in Appendix A of the Appendices for the companies' conventional communication processes

order to achieve that. Then you can transport the information and then it will arrive sensibly. The second point is that there must a purpose (M5 Company Albert).

While communicating conventional changes at Company Carl, one manager explained that it is important to show appreciation towards employees. Changes mostly bring times of uncertainty, in which employees can benefit from the appreciation and trust of their superiors, and consequently accept and support changes,

If you pick up the employee and look for solutions together with the employee and take them seriously and appreciate them, yes, appreciation is a huge theme, when change is happening, because without mutual trust, nothing works. But when they realise that there is serious interest and that it's not just feigned, then it will be accepted and leads to the employee also trusting himself and then getting involved in the change process (M18 Company Carl).

4.1.5 Applying information communication to overcome resistance and miscommunication

Although the term information communication was indeed used in all three case study objects, the use of the term differs between the three companies. As established above, managers at Company Albert for instance emphasise dialogic communication while communicating changes. Participants at Company Albert further explained that face-to-face communication is more suitable for communicating changes, since this channel allows for an exchange which consequently has the potential to reduce resistance. Managers at Company Albert also use this approach to be in line with information communication. This means that in the specific case of Company Albert, managers use information communication during face-to-face exchanges with their employees,

And that is information communication, so to say, this is Company Albert, this is the direction, and that is the framework, and I would like to inform them about this, and how we can ultimately implement it [change] together. And so, I decide, I would present this personally and say: that is my intention, and that is the way forward, and I would like to inform them first. That is information communication, and I would like us to discuss how we implement it together (M3 Company Albert).

Similar to Manager 3, who proposed to use information communication as a means of exchange between managers and employees, the majority of managers at Company Albert reported that information communication is applied to reduce internal resistance and to increase acceptance of changes. In general, managers at Company Albert were rather focused on reducing resistance and gaining acceptance for their change ventures,

When the management communicates correctly with the employees it is encouraged to give them information, in order to give them a sense of security (M6 Company Albert).

Company Bertha also aims to reduce resistance with information communication. However, the employees of Company Bertha reported an additional effect in relation to information communication which they perceived after having received detailed information about changes. At Company Bertha, it was reported that continuous information communication was applied, which had positive effects on employees' perception and motivation,

I think we as the staff felt like that we were always well considered by the management. We always knew what was going on and how it was going. And the level of information was correspondingly high. That motivated us (E8 Company Bertha).

The above-mentioned continued information communication at Company Bertha is based on the described change communication process of Company Bertha. Following the kick-off events, more detailed information is communicated individually to all departments. This shows that change-related information communication is also based on Company Bertha's defined process, when general change-related information is communicated to the employees,

Kick-off then a town hall meeting. This is not bad in itself but then you will have to go to the individual departments again and distribute the finer information individually (E6 Company Bertha).

As presented above, Company Carl often communicates internally by using as many channels as possible, including written communication. Thus, information communication at Company Carl often happens over social intranet or via the general email distributor of the whole company. Different procedures are applied, however, when only individual teams or departments are affected by a change,

In other words, a lot of information is communicated over the intranet. Quite early on, too. If there are changes, people are contacted, also an email will be sent to the whole company. And if there are issues that affect you personally, maybe your team or your department, then I think that will be communicated quite quickly before rumours can spread (E17 Company Carl).

Managers at Company Carl were also focused on minimising the effect of false information which, for instance, can possibly be obtained through media and television. Company Carl is a public company which means that media reports containing information about the organisation and its changes are often aired and thus can also be received by Company Carl's employees before internal communication happens. In this context, employees can easily access information which also might be dangerous or harmful for them,

And the employees also notice this and that is why I have to communicate more often and more clearly. The media nowadays offers everyone the opportunity to get comprehensive information, but also to get completely fearful because the sources to read unqualified negative messages are much bigger and that's where I stick with my statement: Communicate, communicate, communicate (M22 Company Carl).

Employees of Company Carl explained that obtaining information is very important to them and exercising resistance is directly linked to the information available to them. Should their management, therefore, not communicate the required information regarding electrification, then employees would find their own way in obtaining the required information.

Resistance? I think that depends on the number or quality of the information you have at the time. Because, I would say, first of all it always bothers you that you try to get more information (E17 Company Carl).

Company Carl was often concerned with the management of wrong or harmful information which could be obtained by employees through the press and media. Thus, one manager at Company Carl explained that information communication is sometimes a 'passive' task for a manager, which means that employees already know about the information and require answers to their questions from their managers. Especially with public companies, employees can access

information about the corporation since the companies are required by law to publish information to shareholders and stakeholders,

People become more and more sensitised to pro-environmental issues, electromobility for instance. Autonomous driving is a different issue and is far in the future. That's why, of course, two things happen: firstly, the company puts immense amounts of emphasis on these issues, and consequently provides a lot of information. Moreover, respective activities are applied to facilitate the changes. People then ask: 'what does that mean for us?', The whole staff itself is actually highly motivated and wants to be informed on this topic. They want to inform themselves and say: 'ok what does that mean now?'. Then they come to you as boss and say what does that mean for us now? And you have to give answers, and that's why, as I said, it's important that you say to the staff: you're not just all merely affected by this change, and then you have to make them involved in the change process, because that's the only way it's going to work (M17 Company Carl). This executive at Company Carl perceived that the best strategy to inform employees lies mainly in the application of all communication channels in order to reach every single employee with the message. However, at the same time, Company Carl changed parts of their internal structure and modernised their hierarchical organisation to allow for a higher rate of information flow, which allows all staff to be informed about new innovation, even staff that are not working in technological jobs,

Through my job, I'm not directly involved in technological topics. However, through these new agile work mechanisms that we use now, our work conditions are changing. The company applies a large, centralised campaign which means that on a weekly basis you will have a lot of information regarding electrification, what it means, and what consequences you will have as an affected person. Cross-functional work groups are formed, where leaders are invited who have to think about electrification and what consequences this change has for the company. Basically, all of this is because employees just have a high interest to be well informed on this topic (M17 Company Carl).

Information communication at the three companies works very similarly. Managers are convinced that the main objective of information communication is to reduce uncertainty among employees and promote their acceptance of changes. It was interesting to observe that

information communication as a theme is used at all three case study sites and that this type of communication is consistent with the communication practices that are applied when communicating conventional changes.

4.1.6 Applying sensemaking communication to gain acceptance

In addition to information communication, another theme was identified from the interviews: information communication by itself is sometimes not sufficient to gain acceptance as it leaves employees unsatisfied with the communication of changes. Thus, it was reported that employees also need to know why the corporation is changing and what the underlying reasons for the change are. Therefore, an addition to information communication was presented by the participants, namely sensemaking communication or why? communication. This type of communication is information communication with a sensemaking angle that explains why the change is important. Most employees at the case study sites reported their need to understand the underlying sense behind ongoing changes. Thus, the management is required to communicate reasons for the current changes to their employees in order to minimise their resistance and gain acceptance for changes.

One employee of Company Bertha explained the fundamental concept of sensemaking communication at his organisation by stating that sensemaking communication has to allow the communicator to provide information and at the same time have an additional sensemaking component within the communication. This sensemaking component must explain to the recipient why the change is necessary for the company and what would happen if the change were not to be applied. So, if it encourages acceptance and motivation of employees, sensemaking communication regarding changes constitutes a better approach for the management and communicators compared to just providing information,

To be honest, everything can change even if it involves me. I would only resist if I am directly involved and would not understand the sense behind the change [...]. What is always important, is that you understand why you change. The urgency behind this, is yet another issue. But to understand why something is changing. It makes sense, or it provides added value. This does not necessarily have to make sense for the individual co-worker, but he or she must understand why it makes sense for the company to do it (E1 Company Bertha).

Furthermore, managers at Company Bertha explained that sensemaking communication allows the management to answer fundamental questions of the recipients, so that management does not need extra communication channels or events to answer those questions,

What is the goal? What is the benefit? What is the sense behind it? And what happens if we don't do it? To get to the point: Hey, what's your contribution? What can you contribute to this? What are your strengths? What weaknesses do you have? Explain yourself? And how do you find that? To get a buy-in, from every single employee for this change. So that's the way it is, that's actually the change that has to come down from above, it doesn't work from the bottom (M10 Company Bertha).

Participants at Company Albert and Company Carl also reported that sensemaking communication is an important communicative measure for the management at their companies, which also aims to gain the recipients' further acceptance for upcoming change ventures,

There must be a certain sense of purpose. Just to say that we are doing it differently now than usual, because it is just like that, this does not necessarily lead to a good acceptance (M5 Company Albert).

The majority of managers at Company Albert reported that the best way to use sensemaking communication is by applying continuous and repetitive communication which allows the employees to understand why the change is essential. Continuous and repetitive communication being universally used at all companies underlines the importance that communicators at all case study sites attribute to continued communication during changes. In line with the established communication strategies of Company Albert, where especially dialogic face-to-face communication is applied, managers at Company Albert further explained that continuous and uniquely personal face-to-face communication is the most valuable form of communicating the meaningfulness and sense of a change to employees and can also reduce potential resistance,

I think you have to repeat it quite often. So, of course, maybe people will get tired of it, but to say I'll announce this once in a company meeting or somewhere, that's never enough. So, I think you use different methods, and I think the personal approach

especially with certain groups requires intensive contact time so that they understand what it is really about, I think is very important (M1 Company Albert).

One manager at Company Carl explained that sensemaking communication alone is not enough to motivate younger employees, since in their own perception they are working to make a difference in the world. Therefore, managers have to additionally offer meaningful tasks to younger employees,

This is a generation that has grown up, that thinks 'I don't have to work to solely make money'. Usually, you have something like that. So something like that is there somehow. In other words, satisfaction is required by them, without fear of losing what they have. That's why when they're here, you can also see with the changes within the organisation, the things that are interesting, where they can unfold personally, where they take something meaningful for themselves, these tasks are highly attractive for them (M19 Company Carl).

Managers at Company Carl were the only participants who considered the internal age structure of their company regarding sensemaking communication practices. Contrary to Manager 19 of Company Carl, who considered the younger generation, Manager 18 of Company Carl reported that, in general, all changes should be communicated openly and honestly, in order to offer reasons and meaning to employees in changing work environments, especially to those employees who have worked in the same job for a long time,

And in my view, only a lot of open, honest, transparent communication really helps, that is, as soon as information was actually available, we sat down at the table with the employees. And then we said: what is the goal and why do we do all this? You always have to explain this well and justify it so that an employee can understand it. And certainly, it's always very difficult for an employee when he's done the job he loves for 20 years and now he has to do something different tomorrow (M18 Company Carl).

Employees at Company Carl equally value sensemaking components to change communication. Some employees of Company Carl reported that sometimes, previous company internal conventional change communication was missing a sensemaking component. This resulted in employee uncertainties and distrust,

That executives should be better in sync and not communicate one way or another. The problem should be described more closely and what exactly they want to address with it. If they just say: ‘We have to save money’. Well, yes. We can all imagine why, but it would be better if they would make that more specific. They cancel all sorts of department events and Christmas parties because they always say: ‘We have to save money’. And that appears to be a quick shot. They could communicate that better and say: ‘We have to do all that, why?’ (E14 Company Carl).

4.1.7 Conclusion: Conventional change communication

As presented above, Company Albert applies a very dialogic, face-to-face-driven communication approach, where managers try to communicate changes directly to their employees, since they believe that dialogic communication allows them to reduce resistance the most effectively. This makes sense for Company Albert because this company is rather small compared to Company Bertha and Company Carl. This is the reason why managers at Company Albert have smaller teams and more time for their individual employees. Their dialogic communication approach is based on their belief that communicating face-to-face is the only way to reduce their employees’ resistance.

Company Bertha was found to have a very process-driven communication structure when communicating changes. In this context, Company Bertha starts all change communication exclusively with town hall meetings or kick-off events, where many employees are informed by the board of management about upcoming changes. Following the information communication of the board, change communication is carried over to the individual teams and is discussed in smaller groups of approximately 50-60 people, which allows for a dialogue between employees and managers and for questions to be asked. By following this strict process for every change communication, Company Bertha enables employees to know what will happen during the communication process which gives them a sense of security.

Company Carl uses many channels during its conventional change communication process and is the only company that does not refrain from also using external communication and written communication. This can be explained by the fact that Company Carl is a public company which has a lot of outside stakeholders and has been in the public focus for a long time.

To conclude this section about the case study objects' conventional change communication practices, it can be said that all companies follow different communication approaches, but when communicating conventional changes, they are yet similarly consistent in their own communication strategies. This means that these strategies at the three case study sites might vary, but once management has decided on a strategy, all managers comply. Furthermore, the overarching goal of all three companies is to reduce employee resistance and gain acceptance for their change ventures. Therefore, it was found that all companies use transparent and continued communication, information communication and sensemaking communication to include their employees in change processes. The similarity in their approaches raises the question of why they use different channels and communication strategies when communicating conventional changes. This, however, can be explained by differences in their size and the companies' different internal organisation.

As discussed above, electrification is not an ordinary change as it is inevitable for automotive companies and thus can rather be understood as a political topic which is widely discussed in society and politics. Therefore, many different views and perceptions of electrification are present in the three companies. Therefore, the following chapter will present managers' and employees' perceptions of electrification separately. The two groups at each case study site face different challenges regarding electrification and thus will have different perceptions.

4.2 Managers' perceptions of pro-environmental changes and electrification in the automotive industry

4.2.1 The automotive industry at a crossroads

Company Bertha and Company Carl have both set themselves the goal of becoming carbon-neutral within the next 20 years. Electrification of their products will play a major role in achieving this goal. Being a smaller corporation compared to Company Bertha and Company Carl, Company Albert is not as much in the public focus, which explains why it has not set itself the specific goal of becoming carbon-neutral until a specific date.

In line with the set goal of carbon neutrality, managers at Company Carl for instance reported on several pro-environmental projects with the objective of reducing carbon-emissions and ultimately achieving carbon neutrality. All these projects were provoked by the change of electrification, which impacts almost all staff. Electrification dictates automobile producers to change their current production processes and their current products fundamentally. Changes are commonly linked to uncertainty, but electrification provokes managers of automotive companies to question those activities of which most OEMs are proud,

It's still very abstract, but when I make a decision today, fuel cell or something else, the question arises, can we still participate in racing events? (M22 Company Carl).

The first steps of electrification aim at the overall reduction of CO₂ emerging from the current ICEs of car manufacturers and suppliers. Thus, all managers, including board members, are faced with difficult and far-reaching decisions,

Today, we still build eight-cylinder engines with great success. We make an incredible amount of money from it. Shouldn't we just build 4-cylinder cars? So, these discussions are about to arise, you have to deal with them (M22 Company Carl).

It became apparent that many managers at Company Carl perceive electrification as an uncertainty that impacts every area of the company, every task and all staff. Uncertainty towards the pro-environmental change of electrification is a widely spread topic, as is uncertainty regarding whether adopting electric engines as a drive system is the right strategic approach to pro-environmental change. There are several other carbon-free drivetrains like the fuel-cell or ICEs powered by synthetic fuels, for instance. Thus, it was reported that the question was often raised whether electric engines were the right strategic decision for automotive companies at the moment to reach their ambitious environmental goals.

Manager 18 in turn reported to perceive a lack of transparency in Company Carl's communication approach regarding innovative drivetrains and further added that the diesel scandal, has led to 'blind bets' on e-mobility, which is not the wisest decision in Manager 18's eyes, since the diesel scandal pushed all German automotive companies towards electric engines simply because of the poor public perception of diesel and ICEs,

I don't think you can stop the path to e-mobility. I think it's a pity and I think that's not communicated properly, nor is the media transparent about diesel. Of course, there were issues, there is no question about that. There is still the question of what happened [regarding the diesel scandal] and whether this is a grey area, or is this a violation at all or not? But I think this blind betting on e-mobility is not the wisest decision either (M18 Company Carl).

The diesel scandal was triggered by some German automobile producers purposely using manipulated software which displayed lower CO₂ emissions from diesel engines while driving. These wrong and lower numbers left consumers with the belief that the purchased diesel car was beating the EU-dictated climate figures by a substantial amount. In reality, these numbers were manipulated by a software and were actually over the CO₂ limit set by the political institutions. Once the manipulated software was uncovered by independent engineers, a major outcry from all customers of German cars around the world led to car manufacturers apologising and recompensing the consumers. Company Carl was partially involved in actively deceiving their customers, but the public outcry pressured them to change their direction towards electric engines. By changing towards pro-environmental drivetrains, Company Carl and other manufacturers hoped to regain their good standing with the public and politicians. Thus, this change was described as 'placing blind bets' on electric engines by Manager 22 of Company Carl, since it was triggered by bad press and public pressure and is not well perceived in German automotive companies.

Furthermore, Company Carl and Company Albert can be considered typical representatives of the German automotive industry, which includes the automotive supplier industry and the industry of mechanical engineering, both having a 150-year history in Southwest Germany. Electrification challenges this heritage and tradition, since this change is linked to production and process simplification within the companies, a topic that will be presented later in this chapter. Considering the fact that electrification constitutes an epochal change for classical automotive companies, the question was raised in what manner electrification can be implemented and communicated in automotive companies,

The question is: do you have to do this evolutionarily or do I have to make it revolutionarily? And even if I say: are we now back on digitalisation and electrification? And electrification, yes batteries, battery technology will come but the question is of

course also: is it really necessary that I now really neglect other technologies. So, it's always a question, the big question is: Revolutionary vs. Evolutionary and that shows itself, and now comes the question: if an over 100 years old traditional company that comes from mechanical engineering, whether this company is able to act revolutionarily I ask cautiously to doubt that. That is the big question (M17 Company Carl).

Managers at Company Albert, which has a similar tradition and heritage to Company Carl, thought similarly about electrification, and thus regarded the staff in the automotive companies as too inexperienced with drastic changes like electrification. Drastic changes often require staff to reflect on the status quo and what the future will look like. Considering the past 50 years, in which German automotive companies have been greatly successful, the staff were never forced to reflect on their work, and thus a routine of merely administering and maintaining the status quo manifested itself,

I believe that people who are working in the metal and electrical industries are still actually – I always say in the 'Purple Wonderland' – I mean, there has never been a need for this industry and its people to get involved and reflect on new technologies in this regard (M2 Company Albert).

By contrast to the managers of Company Albert and Company Carl, managers of Company Bertha reported to perceive electrification as a very positive change and a necessary step for the automotive industry to reduce CO₂ emissions,

I think, what you always realize is, for example, India is not a really clean country. They do not care much for animals, environment, and their living conditions. Everyone I know who returned from their said: oh, in this regard, everywhere should be like Germany. So, we have this role model function and I think that is right and important. Especially when everyone says now: Why should we change or do something better with diesel? Why should Company Bertha make diesel engines even cleaner? Well, the others do not do anything about it! (M15 Company Bertha).

Managers at Company Bertha perceived electrification and pro-environmental changes as a responsibility that had to be assumed based on their company's tradition and mission and also because some managers perceived that other automotive companies do not want to assume any

responsibility.

No, so with Company Bertha, this is not just an idea [electrification]. With us, it's always that we ask, how can we improve the safety and the lives of all people in cars. Thus, we develop ESP and ABS, we develop even cleaner engines. We always try to be pro-active. While unfortunately I have to say, I do not have this impression with the rest of the automotive industry that they would say: oh, we really must do something, we must change and redesign our engines because we poison the environment (M15 Company Bertha).

This section has shown that managers from Company Albert and Company Carl have rather negative perceptions of electrification and that managers of Company Bertha perceive electrification as a necessary change. The following sections will further explore these discrepancies between the managers.

4.2.2 Electrification as an entry card to access new markets

As described above, one reason why major German car manufacturers are now faced with electrification is the poor public image of diesel engines which has mainly been caused by the scandal about the use of manipulated software that indicated lower CO₂ emissions. Automotive companies thus feel the need to lift their public image, but their old product range, which almost exclusively consists of parts for ICEs, meets with lower customer demand and inhibits companies from entering new markets,

Honestly, at the end of the day, it's also about using the full capacity of the machines and selling many products. Of course, environmental thinking is not always the driving force. But it's what we say - where is the place of the company, where do we want to settle with our products, how do we present ourselves to the outside world. And that's also important for the employees, so they say I work for Company Albert and Company Albert makes many innovative products that help to make mobility cleaner (M1 Company Albert).

Along those lines, Manager 2 from Company Albert confirmed that electrification is primarily perceived as a means to gain access to new markets regarding e-mobility and mobility solutions,

It's part of the strategy to say: I want to go into these markets now, but I actually think it's more out of a business motivation than through the thought that I'm going to make myself green in quotation marks. It's all about business at the end of the day (M2 Company Albert).

In contrast to Company Albert and Company Carl, Company Bertha also has business interests other than just the automotive sector, since it is a conglomerate that includes many branches, the customers of which are not limited exclusively to the automotive sector. Furthermore, most automotive parts that are produced at the visited branches of Company Bertha were already electrified approximately five years ago. Therefore, electrification at Company Bertha provides substantial business opportunities,

However, where I see a great opportunity, is in the initiatives that we are now discussing regarding mobility solutions. Every single one of us is confronted with it on a daily basis, namely mobility. And considering mobility, you can make everyone understand if you're providing car sharing now [...] With all that you can contribute to *CO₂* reduction (M10 Company Bertha).

Since electrification and its inherent pro-environmental changes are currently being implemented in German automotive companies, it can be observed how electrification changes the way people are working on a day-to-day basis. Considering public opinion and the ecologically driven policies of some German federal states, it can be assumed that automotive companies will also be subject to drastic pro-environmental changes in future.

4.2.3 Electrification as political and public pressure

The study participants' negative perceptions of electrification were in most cases triggered by specific circumstances, one of these circumstances being the involvement of politics in companies' decisions regarding electrification. Politics, the media and the German public in general believe that the industry is able to supply electric cars for everyone within the next five years. This however will not be possible because of missing infrastructure and missing links between battery life and driving performance. Yet, politics and the public push for electric mobility although they are not fully informed about technological and structural problems,

[...] this pressure and this mass pressure from the public perception or from the public environment and with it also the associated uncertainty how it will go on - one could already think from the public perception that in 5 years we will all be driving electrically - I honestly do not believe that. Of course, electromobility will play a major role, but that is just what people on the outside perceive (M2 Company Albert).

Another manager at Company Albert also raised concerns about the infrastructure and stated that the infrastructure and especially the electric power grid would be overstrained if full electrification would occur,

It's not consistent and, it can't be consistent because – I can't just fool people and say from tomorrow onwards everything will be electric and from tomorrow we'll all be driving battery cars. I don't think we're going to get enough power from the grid capacity that's under the ground. I do not think that we are even getting close to the amount of energy needed to charge cars, whether that's at night or charging through the pipes throughout the day. So, a small example. Two friends of mine wanted to buy this American electric vehicle and asked EnBW for a high voltage charging station at home, where they can practically charge the car in the garage. Then they said, yes, we can put the charging box there and everything, that is not an issue. But it turns out, the infrastructure does not exist. Yes, if the two of them charge their car, then practically the whole electric power grid is dead (M7 Company Albert).

Together, Company Bertha and Company Carl almost employ 800,000 people, which make them an entity of high significance for politics. Thus, participants working at these two companies reported that political regulations pose a demanding challenge,

Electrification for us is simply a change in the drive system. A profound change yes, but in principle that's it. So, there's the car around [the drive system], there's mobility, which is going to reshape, things are going to reshape, also from the mobility offerings and so on because of electrification, but in principle it's an expanded form of a drive system. So, I say the big change is more what's going on around the world, through [political] regulations and so on (M21 Company Carl).

It was reported by managers that politicians initially were against electric mobility but had to change course when polls dropped, and it became evident that public interest in green mobility and traffic policies was a deciding factor in the state-level elections. Therefore, companies like Company Carl were suddenly required to adapt to the public and political requirements in order not to jeopardise their economic performance,

Politicians also tried to say at the beginning, no to electromobility, and then you saw in the polls, their votes going down, so everyone jumped on the topic of e-mobility. And since then, through politics and the media, the communication has intensified. [As a company] you can't even say no. Then you're done straight away. So, in that respect it is quite astonishing what media actually does with people, yes. How easy to manipulate they are (M18 Company Carl).

Managers in general complained about the one-sided approach of CO₂ reduction policies that mainly shift the blame to vehicles and not other areas that could be addressed,

Now we must consider how the technology [regarding power trains] is evolving. Unfortunately, politics decided to dictate technological concepts and regulations to us. I think, this is highly alarming. This means for us now, that in the foreseeable future, we require extremely high development - and battery capacities. I need to look for people in all places, all of a sudden, I need specialists for IT, batteries, and internal fuel cells (M22 Company Carl).

Society values the thought of lower CO₂ emissions and the positive environmental impacts of electrification, but managers observe paradoxical behaviour when considering the needs of their main customers. Thus, the automotive companies find themselves 'between two chairs',

We now must consider two things. The question is what contributes more to an improved climate? People right now buy SUVs and not small cars. I will easily get from A to B with a smaller car too. Another question: why do people not buy an electric car? They don't buy an electric car because the infrastructure is not present at all and because the cars do not perform in the way that they [politics] promised them. But right now, we need both, conventional cars and electric cars. Because we need conventional cars to finance or make money for electrification. I mean, it's all expensive what we have to

do. Right now, we set aside billions in reserves to finance electrification. That is why the automotive industry is struggling right now. We are not struggling because we don't sell cars, we are struggling because we set aside reserves to finance this change (M22 Company Carl).

What became apparent during data collection was that there is great frustration among managers regarding public and political pressure. Managers at all companies complained about the outside pressure exerted on them through policies and public perceptions that require them to become greener and create sustainable, electrical drivetrains. Therefore, in their eyes, their freedom to find solutions to reduce CO₂ has been taken away from them since no one has an answer as to whether electric mobility is or is not the solution to sustainably reduce CO₂ in the future.

4.2.4 Electrification leads to reduction of complexity which equals reduction of jobs

As presented above, politics and society push automotive companies towards electric mobility without knowing whether this drive system can even be implemented in the country's infrastructure. In addition to feeling pressured by politics, managers also see big short-term problems which emerge through electrification. Especially traditional automotive companies like Company Albert and Company Carl fear that electric mobility could cause a drastic increase in unemployment figures which can be caused by the simplification of electrified drivetrains,

Also, when I tell my people in production now: we are currently making 95% of our sales with the ICE [...] A disassembled ICE has 3,500 – 4,000 parts. And then they take an electric motor and a lithium-ion battery or an electric motor and a fuel cell. That's maybe 500 parts. And then [you see] how complex an ICE is (M4 Company Albert).

Thus, it can be concluded that a 'complete electrification' of car production would lead to a simplification of powertrain supply lines and production processes. This would signal to the public and to investors that an enormous number of employees could potentially be laid off. Especially in Companies Albert and Carl, a large portion of the workforce would probably become redundant if the newer and simpler technology inherent to BEVs or FCEVs were to be fully adopted,

If there is a complete electrification, if you consider the electric battery powered powertrain, then simply a massive reduction in complexity follows. Which means that I need significantly fewer employees, not only with us but also with the supplier companies. This change is necessary to make it [mobility/cars] more socially acceptable. However, if this happens overnight, then you can completely close certain plants and departments. Because they don't need them [workers and their products] anymore (M21 Company Carl).

Manager 17 of Company Carl specified the numbers of employees who could potentially be laid off if full electrification took place. Although politics and society, both of which have always relied on the automotive industry's tax money, push towards a complete electrification,

Electrification, if you take this in concrete terms, it will have a massive impact on the world of work in the automotive industry. If you think about it, if we assume it's fully going to happen, if you look at the powertrain, the engine and the powertrain, and we're going to implement a full electrification more and more, so we're just doing electric mobility. Then we need, let's say, 60% fewer staff along the supply chain. The employees are already going to think about what that means for us, what kind of a perspective on the car industry they will have (M17 Company Carl).

Moreover, manager participants were faced with the question of how the identity of the German automotive industry must adapt to the new products. Since electrified drivetrains possess different driving properties, the identity of the German car itself is questioned through electrification,

At the end of the day, other things will be more relevant to customers. Because an electric engine, you will have work with sound systems [to imitate engine sounds]. You will also have your particular sound then but, in the end, everyone knows: Ok I drive a in a vehicle with an electric engine inside. Thus, [product] differentiation will cause other issues. What is the interface between man and machine, what digital services do I have in the car and how reliable is the car? And I think that's the key. The engine, the driving property of the car, will no longer be what German engineering has been associated with for the last 100 years. Cars in top speeds which you can drive in curves,

look at them when you compare a German car to an Italian vehicle, a Ferrari or a Lamborghini. They are all fast, but if you drive with it on the Nordschleife into the corners, with a German car, there is still a difference, but this differentiation feature is no longer relevant with electric engines. Because the electric cars are no longer built to drive 300 km/h. But rather to drive around 150 km/h (M17 Company Carl).

4.3 Employees' perceptions of pro-environmental changes and electrification in the automotive industry

4.3.1 Employees' perceptions regarding the necessity to reduce CO₂ emissions

Company Bertha is differently impacted by electrification because of their organisational and strategic focus. Thus, Company Bertha can pursue its vision and mission of constantly improving the community with their products. This is a reason why so many young professionals and graduates, sharing the same ideals and vision of a corporate culture, want to work for Company Bertha,

In the automotive sector, I would say that environmental protection has always been a tradition with us at Company Bertha. So, I mean, at times when diesel was still totally accepted, there was a commercial from us: Clean, Green, Diesel-Power. So, I think that Company Bertha has generally always worked in this direction. Looking at what is environmentally friendly and how we can make it even more environmentally friendly (E5 Company Bertha).

Company Bertha's organisational and strategic orientation gives its employees the impression that Company Bertha is a company where many like-minded and pro-environmentally oriented people are welcome to work. Therefore, not only is a pro-environmental change like electrification perceived positively by employees, but it was also reported by one employee that possibilities are sought to take pro-environmental matters into their own hands at Company Bertha,

That means I think it's perceived really super positive here and I myself perceive it super positive too. I have written to our transport minister myself, [to ask that] you'd have to

analyse here – where do people work, where do they come from and what is the traffic situation? What works well, what might work not so well? And then the transport minister’s spokesman called me and practically told me that he could not do anything about it. But now we have a project team which is analysing the employee mobility situation internally to find out the travelling patterns of our staff (E12 Company Bertha).

Actions like these show that employees at Company Bertha are genuinely invested in pro-environmental changes that involve mobility and electrification. Furthermore, employees at Company Bertha often stated that they would rather work for a company that encourages pro-environmental actions and offers a perspective for the future, which includes reduction of CO₂ emissions, and thus enhances its products with electrified components,

I think it is a very good idea and everybody should be concerned with this. Yah, I mean we were, I say we witnessed it this year again, we had a heat wave, twice. I mean, I think it is about time to do something. I’m actually I don’t know why we were not informed in our department if Company Bertha signed up for such a thing, I think it is a very good idea and I am very happy that Company Bertha did that (E2 Company Bertha).

Furthermore, some employees at Company Bertha explained that they perceive the political actions regarding pro-environmental behaviour as too slow, and that they are happy to be a part of an organisation like Company Bertha, which is driven to reduce carbon emissions to improve its environmental impact with technological advancements,

I don’t think anyone wants to work in a company that doesn’t care about the future. And I mean Company Bertha is predestined with the different technologies we have. That must be our ambition. I think that politics works a bit slow and their behaviour is not yet as aggressive as it should be (regarding pro-environmental actions). If a company like Company Bertha is moving forward with big steps, then that is only positive (E8 Company Bertha).

These statements by employees of Company Bertha show that their company, which already offers an electrified product range, differs from classical automotive companies like Company Albert and Company Carl. In general, the perception of electrification and pro-environmental

changes is overwhelmingly positive at Company Bertha. This can be explained by their unique culture and strategy towards electrification, which was already implemented five years ago. Therefore, they are less impacted by public and political opinions and thus have a better perception of electrification.

4.3.2 New technologies constitute motivating factors

Despite the technological concerns that were raised by some managers targeting new mobility solutions, it was reported that employees at Company Albert who work in new mobility departments are similarly motivated for new electrified products like the employees of at Company Bertha. Thus, employees identifying with their tasks and the new pro-environmental products can be motivated by new pro-environmental actions of their companies,

With the colleagues in the field of New Business Area, there is already a certain sense of mission. And so, as I said, the boys and girls who already fully identify with the task also know that they make a massive contribution towards climate protection accordingly. I think there is a feeling that we cannot go on like this, which is perhaps more diffuse for some but for others it is completely clear. So, there is certainly a motivational boost for people when they see what is being done in the new production site that is being built there. [...] There are actually products that make mobility environmentally friendly. And to be able to participate in this as a company, that motivates (M8 Company Albert).

Employees at Company Bertha working in new business areas also reported perceiving electrification as advantageous for their careers since all employees learned about electrification and gained new experiences,

Yes, there will be a lot of changes, and this is still a really new topic and I think everyone in this industry is trying to find out. Because from time to time there are big announcements on ok at this date, we should be able to have automated cars at this date we will have semi-automated cars and so on. And right now, we feel like we are able to change. We have enough technology to change. We need a bit of time obviously. But it is something still really new and really, the benefit for me is that I can tell you in five

years that I have a lot of experience in this field. And for my personal development on the job point of view (E19 Company Bertha).

Along those lines, Employee 4 explained that he believed that companies that do not invest in the future, for instance by spending time and money on projects like electrification or carbon neutrality, would have immense difficulty surviving,

In fact, I believe that in the future, companies will not be able to get away with this issue at all, and especially with young target groups, which are now becoming more and more important for all companies in the next few years. I believe that there is not going to be a way around it. So, I believe that a company that is simply not environmentally conscious, which does not set goals such as: We want to be *CO₂* neutral, we want to do something for the environment and so on. We want to do good for the environment and so on. That they (not environmental-friendly companies) simply have no chance of surviving in the future (E4 Company Bertha).

4.3.3 Technological flaws and missing infrastructure for electrified drivetrains

Not all employees, however, perceive electrification from a positive standpoint. Employees working for Company Albert and Company Carl had perceptions of electrification similar to those of their managers. Thus, it became apparent that most employees at classical automotive companies perceive electrification as a threat and express concerns regarding infrastructure and outside pressures,

So, I don't think electrification is bad. There are many opportunities. But risks, a lot of risks too. And the risks, are clearly in the infrastructure, the way energy is transported, the energy grid and so on. These risks are immense. What the automotive industry is doing right now is actually far too big of a project. That means the industry is actually doing much more, on the development side, money is invested on our behalf, and politics does not support to this to an equal extent. That means I don't get anything if I have an electric car and I don't even get a charging space (E13 Company Carl).

Moreover, employee participants of Company Carl explained that, at this stage, in addition to the electricity demand, electric cars are unreliable since inclement weather still affects the

batteries' performance and the cars themselves in a negative way, thus further limiting their range,

From the fact that the ranges don't fit, that the cars break down every now and then, and that something like cold weather still affects the batteries, to the thought of: ok, that's now being massively pushed (electrification), but is that what the country can carry or create? Actually, considering the background, just as long as the electricity still comes from coal. Then an electric engine is a nice thing, but that's what I just meant with, that's just a bit of a cosmetic measure (E14 Company Carl).

After the Fukushima incident in Japan in 2011, politicians in Germany decided to shut down all nuclear power plants in the country and since have focused on renewable energies. However, the electricity demand that was met by nuclear power plants was so high that it could never have been covered by renewable energies at the time. As a consequence, to cover the high demand for energy, coal powered plants were reopened, and since then the majority of Germany's electricity has been generated through coal-powered electricity plants. This fact has made many people in the automotive sector wonder why coal-generated electricity used for powering electric cars should be considered a reliable and sustainable source for green mobility. One of the most striking points for participants was that the industry has not yet planned in which direction to go and thus cannot take decisions on which drivetrains to use and to offer to the market and customers,

On the other hand, I also see a whole industry where simply no one has a plan where to go, how to proceed and what to do with electrification. Do we do all this with a normal battery? Will this be hydrogen? Will this be something completely new? (E16 Company Carl).

Furthermore, many engineers who participated in this study also explained that they perceive a lot of uncertainty resulting from outside factors. Firstly, participants at all study sites reported being unhappy that most of the electricity in Germany comes from coal-powered plants, which effectively makes new mobility concepts 'not green'. Secondly, participants explained that the infrastructure in Germany is not yet ready to charge and power a high number of electric cars,

We are all still making a profit and we have to put this profit into battery technology. That is the issue that you then run the whole thing with a sense of proportion. Surely people want to buy electric vehicles, but only - this can only be done as well as politics plays along with how the infrastructure is developed. But if afterwards, I say overnight, everyone was to switch to electric [cars], the electricity grid would simply not accommodate that. You also have to see where the electricity comes from. If this is renewable energy, or clean electricity, then a balance will be up. Yes, that is an issue. The other issue is, where does the battery come from? Where do the rare raw materials come from that I need for the battery? (E13 Company Carl).

Another negative perception that was observed within the employee group and one that was also mentioned by many managers before, was the overall CO₂ balance of electric cars. By producing batteries from rare materials which are mostly obtained in South America and Africa, an electric car must be used longer for it to break even with a combustion engine regarding its overall ecological performance. Moreover, the problem of national electricity production and transportation was presented,

This is just postponing our problem; I think they all think it is a good idea [politics and society] because you are not driving petrol vehicles anymore, so you are actually reducing the amount of CO₂ emitted into the atmosphere while driving. But we all know the production of an electric car actually produces a lot of CO₂. So, if you want your emissions of CO₂ to be, I say, to reach the same. If you want your electric car for it to produce less CO₂ than a petrol car than you have to keep it five years. At least I think, I've heard. So that's a good but again, a thing like a car you can keep it like 10 years. But of course, you have to take into consideration: what about the battery? It is really rare I say components, you have to get them from the ground, you have to mine and that is also a lot of energy consumption, so that is for the car creation basically. But then on the other hand, I think especially in Germany the electricity in Germany is created, generated in north of Germany. It has to be brought to the south of Germany (E2 Company Bertha).

4.3.4 Political influences restricting companies' and employees' freedom

Similar to the manager group of Company Carl, their employees also reported perceiving mass pressure from politics that makes them feel very limited in their freedom. This can be explained by the immense attention of media and society that OEMs are currently receiving. All over Europe, protecting the environment plays an important part in political programmes to appeal to new and young voters, and consequently topics like traffic and mobility are the focus of new legislation and political debate. In general, employees at Company Carl are unhappy with political decisions influencing their company's strategy and actions, since they feel that their professional freedom is taken away from them,

And then also politicians are a bit, I say sometimes go a bit crazy and actually try to ban everything that is not electric. At the same time, we do not have the possibility to drive electric cars alone because the grid is missing because generally the juice does not come out of the tube fast enough, such topics, and I think there, one would just have to go a bit slower and more thoughtful (E16 Company Carl).

Since automotive companies are now the subject of political debate more than ever, it can be understood how political statements may intervene in an organisation's internal strategy. However, Company Carl's employees and engineers are especially unhappy with politicians' statements triggering internal discussions,

On the one hand there is this topic [electrification] that is overly discussed right now, and in the end, it is always the trigger for discussions. Any phrases from any green politician who has no idea about technology, are triggers for such discussions. We usually play fire fighters in the end (E13 Company Carl).

Many employees at Company Carl feel pressured towards electrification, which is a perception that they also share with their managers. Politics and politicians have a major impact on their daily tasks and work environments. What Employee 13 meant by 'playing fire fighters' can be seen in the decision by the Green Party to ban all diesel vehicles from Stuttgart's streets and many other major German cities, simply because the opinion of their voters and the public had turned as far as diesel engines were concerned. Car producers in all of Germany were faced with the almost impossible task of rebuilding their diesel concepts to allow their customers to choose alternatives like petrol or electric engines. The customers and small businesses were the

groups that were harmed the most by this diesel ban since some could not afford new cars but still had business to do in the cities. The Green Party's intention that more people would use public transportation or bikes was almost impossible to fulfil since most countryside towns and villages are too far away and not integrated into the cities' public transportation systems,

So actually, we have seen through the whole [electrification], there is not only the story about CO₂. Clearly CO₂ is an important issue, but this was preceded by the story of small particulate matter in cities. And we all witnessed live that vehicles that were bought three years ago with a clear conscience, EO5 Diesel, yes, three years later, they were no longer worth anything. It was because of the driving bans that we were screwed, and we all could not escape that. That means, there you are as, I say, as a customer the lead bearer and also, we as developers, we have to look, of course, that we get the vehicles up and running to what we have already done before, clearly so the end user was then ultimately the idiot (E13 Company Carl).

On the other hand, many employees of Company Bertha again expressed their support for electrification and perceive electrification very positively, since they are in a position where full electrification would help to improve their sales figures dramatically. Employee 3 also confirmed that the automotive departments of Company Bertha have enough solutions that would accommodate electrified engines' demands. However, as the public perception and especially politics are often rather vague as to which mobility concept will be the one used in future, some employees at Company Bertha also experience uncertainty,

I mean, if you look at Germany at the moment, nobody really knows where it's (electrification) going because politicians don't know what they actually want. I think the industry is in a relatively good position, we have a lot of solutions, maybe not all are ready for serious production, but I say from Company Bertha's point of view I can say for sure, as far as I know from the automotive power train side, there are enough solutions where they say: ok they are super good, as far as the environment is concerned, we could offer CO₂ neutral. It is simply the question: does the market accept it, and what is the public perception. I believe a lot of false information is passed on, not everything that is in the press is actually completely true or let us say absolutely technically correct. People's opinions somehow emerge very quickly, which are formed by press releases, any political phrases etc. (E3 Company Bertha).

4.3.5 Conclusion: Perception of pro-environmental changes and electrification

To conclude this chapter about the study participants' perceptions of electrification, it can be said that electrification as a change triggers many different emotions of the participants. The most interesting development in this study is that Company Bertha's managers and employees perceive electrification as a good and necessary change, whereas study participants of Company Albert and Company Carl perceive electrification more as a threat than an opportunity for their companies.

This dynamic can perhaps be explained by the fact that Company Bertha is a conglomerate with a pro-environmental mission statement. Young professionals and graduates are found to perceive pro-environmental mission statements as an attractive employer characteristic and are thus more likely to apply for companies with a pro-environmental focus. This in turn is also a fundamental communication strategy of Company Bertha for expressing their mission to offer pro-environmental technologies to everyone.

Furthermore, Company Bertha as the biggest of the three case study sites possesses the highest number of engineers, who have shown that they can contribute their knowledge to new automotive technologies just by using their experience from different fields, which is a great advantage when it comes to adapting to new technological challenges. For example, Company Bertha has departments that have developed batteries for other appliances since the 1980s, therefore the engineers' knowledge of battery technology can be transferred to car batteries, since electrification has become an important change for the company. Moreover, Company Bertha's mission statement and organisational characteristics allow this organisation to invest in pro-environmental technologies that have the potential to save the environment simply because it is not imperative for Company Bertha to make profits for their shareholders' sake. These internal dynamics and the mixture of know-how and its organisational setup explain why Company Bertha's employees and managers perceive electrification as a more positive change than participants interviewed at Company Albert and Company Carl.

The majority of managers and some employees, especially at Company Carl, reported to perceive immense public and political pressure on their organisation. It became evident that public and outside opinions shape the perceptions of participants at Company Albert and Company Carl. Therefore, managers and employees of Company Albert and Company Carl

perceive electrification as a negative strategic change that is, to a certain extent, not an internal decision but rather a change that has emerged from political and public opinions. Furthermore, electrification was reported to be subject to many new laws and regulations that can potentially change daily, which increases uncertainty and enhances negative perceptions of electrification. Furthermore, the technological shortcomings of new mobility drivetrains harm the perception of most participants at Company Albert and Company Carl. It was often reported that the new batteries did not have a long lifespan and ran out of energy very quickly. The current infrastructure was also perceived as unable to support electric cars with sufficient energy which leads to many customers being unhappy as they see no chance for themselves to use their electric cars the way politicians promised. Another factor that negatively impacts the employee participants' perceptions is that the energy required to power the batteries of electric cars is mostly produced through coal-fired power stations. This energy generation relies on a process that emits large amounts of CO₂, making it questionable for participants whether electric engines powered with coal-based electricity are at all environmentally friendly. Therefore, it can be concluded that many negative perceptions of electrification were observed while interviewing management participants of Company Albert and employee participants of Company Carl. Both companies are public companies and thus subject to many public and political opinions.

Having identified many different perceptions regarding electrification which is happening simultaneously at three organisations raises the question of how this change is communicated at the individual case study sites.

4.4 Communication of pro-environmental changes and electrification in German automotive companies

Asking managers about change communication relating to conventional changes or changes that have happened before on a more regular basis was seen as necessary to understand how these changes are communicated compared to the communication of pro-environmental changes and electrification. Some managers contradicted themselves by saying that all changes should follow the same or similar communication procedures but then talked about different change communication procedures when considering the change of electrification. This can be explained by the uncertainties and different perceptions regarding electrification which are

present within the automotive industry. It ultimately became apparent that different perceptions of a change yield different communication processes when communicating pro-environmental changes and electrification.

4.4.1 Controlling external media communication regarding electrification

Currently, all automotive companies deal with major outside influences of society and politics. Thus, many managers have reported that the first step of communicating electrification is to control information obtained from external sources such as media sources or political statements.

Since many political parties and members of society take great interest in electrification, the resulting outside pressures impact internal perceptions and can thus provoke fear and uncertainty which seeps into change communication. Therefore, some managers at Company Albert reported fearing that too much information was acquired outside the workplace by employees. There are many sources like TV talk shows and YouTube videos on electrification, and it was explained that some of that content may not be 100% true or is biased because different political parties have different views on electrification. Since a lot of outside information is potentially value-loaded, employees' fears must be handled in companies,

But the fact that we are now orienting ourselves towards e-mobility as an example is of importance for the entire company. And there is also an exact theme for this. In other words, I find it again at company meetings. I also find it in some newspaper articles, and I see construction activities here that fit into the picture. This means that the big picture must be recognisable to the individual. And there may be corresponding interviews or something that you see on the intranet. Ok. I know the headline, that's it. That is one point. In other words, the large line must be recognisable to the individual. The other is that in their personal working environment, the changes and the associated concerns and fears must be able to be absorbed accordingly. I do this with personal conversations (M5 Company Albert).

As mentioned before, Company Albert and Company Carl are both publicly traded companies and therefore are both subject to public interest and media coverage. Public companies in Germany are required to communicate changes externally to investors. Sometimes, however,

this constitutes the only change communication by the management. Usually, change communication at Company Carl happens over various channels such as town hall meetings, letters from the board, social intranet etc. However, being publicly traded and being in the eye of public interest, public media channels such as television covering electrification must also be considered,

Intranet. Television at home. Of course, there is always a letter from the Board of Management on all sorts of occasions - quarterly financial statements, annual general meetings and blah blah blah - wherever there is communication, of course, there is no alternative to [the inclusion of] e-mobility (M18 Company Carl).

Managers thus experience strong resistance regarding electrification from their employees who developed fears and uncertainties regarding pro-environmental changes through external communication,

Employees always propose the same arguments regarding electrification when they express their concerns: everything regarding electrification is too expensive, it is not really environmentally friendly, we are much too late, we are only followers, and other manufacturers are dependent on us. So, I can go on much further with this list. So, these are always the same concerns. In principle, people use these as self-protection or as an argument to oppose or to work against this change (M20 Company Carl).

The concern that employees might obtain wrong information from external sources is also present at Company Carl, even though Company Carl uses external communication channels to communicate electrification. Manager 22 from Company Carl reported his perception that change communication regarding electrification must happen more often internally and has to be clearer since the information obtained by the media could negatively influence employees and thus provoke emotions like uncertainty and fear,

And the employees also notice this and that is why I have to communicate more often and more clearly and, it is clear, the media nowadays offer everyone the opportunity to get comprehensive information, but also to make people completely fearful (M22 Company Carl).

It was thus reported that information communication regarding electrification is sometimes a ‘passive’ task for managers which means that employees already know about the information and require answers to their questions which they have developed by obtaining information from various publicly accessible sources. Since communication that is received over public media channels might sometimes contain unqualified and negative messages regarding companies’ futures, managers must be prepared to answer employee questions regarding negative stock developments or criticism regarding their strategies. Therefore, a substantial amount of communication must happen internally to control false or negative messages which are sent outside the company,

We do this by bringing executives together, by bringing employees together in town halls, by doing round table discussions with employees (M22 Company Carl).

Externally received change communication regarding electrification is a means of communication that is usually not present during conventional change periods and is thus an interesting channel to consider. Therefore, the first step in the communication processes of electrification is for public companies to control external media communication by providing certain information through press releases, thus also mitigating the resulting fears and negative perceptions through internal information communication and sensemaking communication.

4.4.2 Employee involvement, continues communication, and information communication

What became apparent during the fieldwork phase of this project was that many participants, both employees and managers, have developed uncertainty and fear regarding electrification. In general, uncertainty regarding electrification have emerged through participants’ perceptions of this topic, and uncertainty is manifested through the above-mentioned external communication channels which sometimes substitute internal communication. Furthermore, employees were reported to exercise resistance depending on their work tasks. Not only employees practice resistance towards changes; managers also can feel intimidated by the current pro-environmental changes and electrification and thus resist them. Therefore, the next communication measure that was identified at the case study sites was their attempt to control and overcome resistance to this change by applying different communicative responses to electrification.

When managers were asked what strategies could be applied to overcome resistance, almost all managers of Company Albert responded that it is only possible to overcome potential employee resistance with the help of specific communication strategies targeting their resistance and further aiming to establish acceptance among the recipients for electrification by involving them in the change process,

So, when I come back to the second point, the leadership task is that I try to apply transparency - firstly; Transparency also means presentation of information - I am trying to achieve a certain degree of involvement with this. Employees simply have to be given a role to play in saying that this is their role in the change process now. We [managers] just help to shape it (M4 Company Albert).

In response to the pro-environmental changes, Company Bertha formed a diverse project team that defined a strategy and communicated the new pro-environmental changes. Company Bertha hoped that the first communicative response to pro-environmental changes handled by the diverse project team created appealing and continuous communication for their employees. Through the representation of many departments, this project team could offer tailored communication to each department,

If we now have a change in products or the product range, then we form a project team. In this project team, you will have representatives from sales, marketing, product management, R+D, production, logistics and accounting and controlling. Everyone has a representative. Because everyone has a justified opinion on the change (M15 Company Bertha).

In addition to controlling external media communication, managers at Company Carl aim to communicate a strategy that aims to make the nature of electrification clear to employees and point out what is at stake for their company,

On the other hand, talking about resistance now, change processes are always associated with people who, because of their fears say: woah do I want all this? But I believe, if

you look at electrification which is an epochal turn of times that we have in front of us. And if we now let autonomous driving aside, which is still very futuristic, as I said. But there will be no way around this electromobility and that is also all the people who are still in this state of perseverance, because they are simply driven by their fears, they are also aware of that. And of course, we have to try to make it clear that there is no alternative [to electrification] (M17 Company Carl).

This, in turn, means that employees who resist the current changes will not have an alternative in the future to avoid this very change, and thus simply must accept that electrification is inevitable. Not even managers are able to help resisting employees in the scenario of changing work environments,

I wouldn't even say, we experience harsh resistances, but employees are anxious about this change, I think it would be something else if they knew there might still be an alternative. However, an alternative no longer exists. If you consider the corresponding EU regulations regarding CO₂ emissions in vehicle fleets, if you fail them you will get massive problems financially. No car company could endure this in the long run. That's why there is no alternative. How does the Chancellor [Angela Merkel] always say so beautifully? I always find this problematic because there are always alternatives, but in this case, it is almost without any alternatives and therefore, this will do something with people. As humans we are afraid of change and when we have no alternatives, this is what we have to deal with (M17 Company Carl).

Considering Company Bertha's approach of continuously communicating changes, the theme 'information communication' emerges again. All employees who participated in this study reported requiring a high level of information during electrification change communication in order for their resistance to be mollified,

I have to include all and early on as well. And communicate to them what I have planned and why I do this. And they will bombard me with questions maybe for a year or longer they will be concerned with this topic. But I have to inform all, certainly, there is no difference [...] (M15 Company Bertha).

Similar to employees at Company Bertha, employee participants at Company Carl also reported requiring a high level of information communication in order to overcome their resistance to electrification. If no form of change-specific information is communicated to the employees, however, they will start to acquire information on their own by talking to colleagues or employees from other departments, which shows how much information is really needed for them to feel comfortable. Considering the substantial and threatening changes brought by electrification and digitalisation, Manager 17 of Company Carl explained that it was especially important for Company Carl's managers to integrate the employees into these processes and make the change of electrification pressing and relevant for them,

So, I believe at the end of the day, for every change process and that will now progress very significantly with big changes through the digitalisation and the electrification of the automotive industry. I think it is very important that you integrate employees into this process and take them with you. So, you not only say, I now communicate that there are changes and then we live that, but you'd rather say ok: these are the changes that will come for us and what are their consequences? And what does that mean? And what does this do for our daily work? (M17 Company Carl).

Keeping all staff informed and up to date about electrification-related changes is considered very important for the managers of Company Carl since electrification as a change may lead to some automotive companies facing very inconvenient situations in the future, where many departments and their employees may have to be made redundant. This means that, with the help of the above-mentioned communication channels, many questions must be answered and substantial fears of employees have to be continuously addressed by management,

If transmission or the engine production is eliminated, what happens to the employees? What happens to the production lines? What is the future? And there are also company meetings during this process, where these employees ask these questions to both the management and the work council. And there are also update reports over and over again. This is the current situation or the current discussion situation (M20 Company Carl).

4.4.3 Pro-environmental goal setting and pro-environmental goal communication to overcome resistance

In addition to information communication and sensemaking communication, managers at Company Bertha and Company Carl further reported on a communication strategy that applies goal setting or the communication of goals to overcome current resistance towards electrification. Company Bertha and Company Carl aim to become carbon-neutral within the next 20 years. Carbon neutrality is one of many goals set during this pro-environmental change and the companies hope that these goals will be a motivating factor for the employees. It must be added that managers at Company Albert do not use pro-environmental goal setting like Company Bertha and Company Carl do. This can again be explained by the facts that Company Albert is much smaller than Company Bertha and Company Carl and also did not set itself the specific goal of becoming carbon-neutral until a specified date.

Although Company Bertha set itself the clear goal of becoming carbon-neutral within the next 20 years, it was reported by managers that after setting this goal and implementing the first internal changes a difficult phase of uncertainty began. In their opinion, the set goals will only be measurable after the first phase of uncertainty has been overcome and some time has passed to make a comparison to the status quo. Therefore, internal communication has the task of continuously reminding all staff about current changes and change goals, in order for no one in the organisation to forget about current changes and their subsequent goals,

In the course of this change process, it is now something new, but as I have described before, it is important to make them understand the goals. We also want to achieve measuring the goals afterwards which is also difficult. So, in our case, these are organizational changes. In the case of organizational changes it is often the case that you first face small phase of difficulties after implementation, until the stabilisation actually takes effect. Then the advantage [of the change] is usable, and this can take a few years. I have no experience however, because we haven't had these few years so have not reached this phase yet (M10 Company Bertha).

Managers at Company Carl reported on an approach to overcome resistance, namely setting achievable goals for electrification to enhance employees' motivation for this change. It was further explained that goal setting at Company Carl is perceived as an excellent motivating

factor, especially for pro-environmental changes where the goals can be measured using tangible figures like CO₂ emissions. Managers acknowledged, however, that goals concerning electrification could be frightening at times for some recipients because the set goals might affect them personally,

I think it [pro-environmental goal setting] is a great motivating factor for most people, but for some it will also be frightening because it affects them personally. But absolutely, I also believe that many people see the need for us getting there [reaching those goals]. And that's a motivation, I've talked about moving things before, that's the ambition [...] (M21 Company Carl).

It is understandable that Manager 21 reported that pro-environmental change goals could be perceived as frightening since some recipients think that lower emissions mean fewer produced engines, which in turn means fewer workers. It was explained earlier that some change goals are dictated by legislation and others are created through internal change processes and change goals like having a completely electrified fleet by 2050. Regardless of the nature of Company Carl's change goals, their fulfilment is key to achieve carbon neutrality and zero-emission fleets. That is why managers want to communicate a clear direction,

It is the very clear strategy. I mean, our boss said not so long ago that by 2050 the fleet will be completely electrified or emission-free. And that means, for him, in the next 20 years. At this point we must have completely electrified the fleet in order to drive completely emission-free over the following ten years of change until 2050, so that we also take the last combustion engines out of the market. And that is a very clear announcement. And that is a very clear direction which is also communicated internally. Of course, I say, at a top management level, it is relatively simple to say that we want this. The difficulties or challenges come at the deeper end of the operational business and the operational development respectively. Because 20 years is soon, if you look at our process at Company Carl. Considering the timeline behind this change, that's quite an ambitious announcement. But it is clearly communicated, and it is clearly directed to take this course (M20 Company Carl).

Pro-environmental change goals will provoke decisions about whether the production of vehicle types with the biggest adverse ecological impact should be reduced. The resulting limited

development capacity (from the reduced vehicle production) in turn must deliver greater added value to make up for the lost capacity. This added value can be understood as ecological goals, which are favourable when reached by Company Carl, since ecological performance can be reached through more internal and pro-environmental production and development capacities. In order to structure the goals, managers reported that they want to make change goals comparable and traceable for all staff and also for the public,

This means that we must achieve a 15 percent CO₂ reduction by 2025 across the entire fleet. Then by 2030 we must have a 30 percent reduction in CO₂ emissions. So, in other words, there are already shorter objectives, which we are clearly working towards the overall goal. And broken down from this, that's the driving force at the moment. Complying with legislation on CO₂ reductions. Broken down from this, which vehicle types have the biggest impact [environmental impact]? And broken down from that, where do we now put our limited development capacity in order to deliver the greatest added value for this 15 percent, 30 percent and so on? This means that we also have to focus consciously (M20 Company Carl).

4.4.4 Pro-environmental specific communication methods: Creating automatisms and tactile communication

An interesting finding made at Company Bertha and Company Albert regarding their change communication while addressing electrification was that these companies use unconventional communication approaches to create urgency and convey the importance of electrification. Tactile communication can best be described as a communication approach which uses actual cars and car parts that are presented during an announcement for employees to have a connection to their products. Furthermore, tactile communication can be used through leaders who set visual examples through their behaviour and actions on a day-to-day basis to encourage employees to adopt those behaviours.

Considering the internal pro-environmental changes at Company Bertha, where electrification is only one measure in a line of several changes that have the objective of transforming the organisation to become carbon-neutral in the future, other measures must be taken in order to minimise CO₂ emissions, although these measures might impact the employees' workplace and their daily routines. Hence, managers reported that communication aiming to enhance

employees' common sense regarding pro-environmental behaviour does not perfectly work most of the time. Thus, managers at Company Bertha aim to create automatisms for the employees in order for them to achieve fewer carbon emissions without being told that they have to take actions on their own. These automatisms, which are created to achieve pro-environmental behaviour in addition to the ongoing change of electrification, will have to be demonstrated by the management in order for the employees to follow them,

But I myself actually experience it in the way that with the goals we have implemented here at the site if you try to do that with, I say, these methods as you said: Where I would casually say: clear the dishwasher or put notes up that would say: 'turn off' [*computers*] or 'fill cups in dishwasher' or 'don't print in colour' on the printer. People don't care at all about it. So, better create automatisms than appealing to common sense now, because that will usually not work (M15 Company Bertha).

To reach all employees at Company B, Manager 10 applied Company Bertha's communication approach regarding the creation of pro-environmental automatisms. They explained that an indirect communication which uses automated systems to subconsciously communicate pro-environmental messages to the employees has a big potential to be perceived positively and appeal to many employees. In this specific communication strategy, Manager 10 also focused on automatisms that subconsciously communicate pro-environmental measures to Company B's employees,

Regarding mobility, you can make people understand what kind of contribution they can make when they use car sharing or use public transportation or use the option to stay in home office or whatever. They can contribute to reduce CO₂. However, I think it is way better to communicate when you install sensors that turn the lights on when somebody is present on site. We realised this project. When nobody is here, the lights turn off. When somebody is in the office and walks through it, the lights turn on in front of them. And people realise that in the beginning and say: 'wow that is interesting and great' and then that's ok (M10 Company Bertha).

Compared to Company Bertha, where automatisms are created in order to lower carbon emissions, managers at Company Albert pointed out that they like to use visual and tactile examples to demonstrate how electrification will impact their company in the future. Thus,

employees are supposed to gain knowledge about current and future developments regarding electrification. In line with the idea of information communication, managers reported providing 'striking' examples and information to employees to show how electrification will impact their companies and workplaces. First, this communication is applied to create the necessary urgency for employees to respond mentally to the change. Since the products of Company Albert are the focus of this type of change communication, it is easy for all employee groups to follow,

[...] take a concrete example: So, now considering the current topic 'change in the automotive and the supplier industry' regarding the topic of electromobility, alternative drive concepts, you have to make this change striking for the people (M4 Company Albert).

Managers at Company Albert explained that the initial training for employees includes product training to ensure that all employees obtain an understanding about where Company Albert's products are used, how they work and what they do for mobility. Thus, employees can identify with their products when they see them on the street. It was thus reported that employee identification with Company Albert's products makes change communication strategies more accessible for employees, since they provide a certain transparency with which employees can identify. This transparency and identification component is achieved by the management when they put Company Albert's products at the centre of their communication, which allows all recipients to identify with the main component of the communication,

But if we bring in new employees, that's actually our strategy across the board to say at Company Albert that induction into these things (technology training) is number one. Only in this way we can create transparency, only in this way, employees can learn what Company Albert actually is. And in what kind of company, they will actually work, and what products we have. If I want to stand at the assembly line all day, I need to know where do my products come from? The car I drive, products from Company Albert are in it. And if an E-Mobile bus is driving in Reutlingen or Stuttgart - my product is also in it (M3 Company Albert).

A tactile approach to communicating electrification could be considered as a form of information communication which is tailored for this specific change, exclusively targeting

automotive companies. However, by using a visual and tactile presentation as a communication form, managers want to show how many parts are missing in an electric car and therefore demonstrate how many jobs and employees will be affected by electrification. While this might create a sense of urgency, this approach could also produce resistance and uncertainty among employees because communication regarding electrification is often linked to this change's limitations and negative effects for the automotive industry and its employees. Thus, managers hope that staff will understand how severe the change of electrification will be regarding the impact on vehicles and how strongly that will impact some positions,

We currently account for 95% of our sales from the ICE internal combustion engine. And then you can show them where an ICE internal combustion engine is disassembled. That's 3,500 – 4,000 parts. And then you take an electric motor and a lithium-ion battery or an electric motor and a fuel cell. That's maybe 500 parts. And then I'd say, 'Now please look at this.' And they see how complex an ICE internal combustion engine is, and also they'd see how 'simple', from a technology side, how simple the new drivetrain concepts are. This shows them that There will be changes. There are many people who produce these 3,500 – 4,000 parts [for ICEs] today, and we will need fewer people to produce these 500 parts [for BEVs]. That is actually obvious (M4 Company Albert).

Furthermore, Manager 6 explained that tactile demonstration using vehicles which contain parts produced by Company Albert will allow for departments with no engineering background to understand electrification better. It will also help them to gain knowledge about Company Albert's technology and will involve them in the change. This action is applied in the hope of gaining broad support for electrification and of eliminating resistance and uncertainty,

And it's best to show them a vehicle. Where is my part [product] in this? You take them into production halls and you show them what's in the car technology-wise. That is the exciting thing. Just a little bit of enthusiasm. And here, too, the manager should use the opportunity to show the technology. A visit to an OEM is also great so that they know why the car is great. Why are they now so concerned with weight reduction? What are the legislations? Because a controller or accountant, they are not, let's say, they are also intelligent, and for them, it is relatively easy to understand such a bridge. They don't have to understand why I'm building the cockpit crossbeam as complicated as it looks,

that's not the important thing, but what I can or want to achieve with this is that you get this change conveyed quite easily to the people (M6 Company Albert).

4.4.5 Using waterfall communication to convey change messages

In contrast to Company Albert and Company Bertha, managers at Company Carl explained that change communication regarding electrification in their company does not require specific channels and is thus mostly communicated in a top-down manner. Of course, not all communication regarding electrification is obtained through external channels at Company Carl, so internal waterfall communication can be considered as Company Carl's predominantly used communication method when communicating changes, including electrification.

It was often stated that waterfall communication is a strategic method of communication that has the objective of reaching every single manager and employee working for Company Carl, so this type of communication should be planned in order to establish an idea and a clear line for the intended communication content,

So basically, with us, first and foremost quite classic – waterfall. The waterfall starts dripping and advances, however, with an underlying idea or concept. Because when a change is communicated, you always want to have a direction shown, where the change goes, how one can imagine how the change will go (M20 Company Carl).

Waterfall communication is only a viable option if managers who are involved in the communication process are not resisting the change and only communicate truthful and honest messages without manipulating the messages with personal negative viewpoints. Many managers at Company Carl complained that waterfall communication constituted a difficult task for them because this type of communication is seen as a balancing act when communicating electrification. During waterfall communication, the message is the most important component and should be constant throughout the communication process and should also address the recipients' uncertainty and create awareness,

That is precisely the big question, that is what is at stake. How do we teach the staff to cope with this uncertainty, with this constant change that they are facing? That's what I said before, there are different ways of thinking, I can only express my personal beliefs

here. I just think that it's a balancing act, communication plays the biggest part. But you must support the communication with actions and decisions. Present all this with a certainty. This is what people need and this is the balancing act to gain a greater awareness of the pressure of change. And this is what people also need to get so much certainty and a sense of security that enables them to work and not have a blockage (M21 Company Carl).

Even though this waterfall procedure was described as a normal approach to change communication at Company Carl, Manager 18 reported that waterfall or cascade communication regarding electrification is mostly perceived as rather unclear regarding its goal so that consideration of the next steps that have to be taken is impossible for staff at Company Carl. Its managers and employees wish for change communication that allows the recipients to understand the starting point and the preferable target of a project. This would enable recipients to always be well informed about what the next steps of the project look like,

So, what I would change would actually be the status where we are and where we want to go, both the starting point and the finish point. Clean communication about the management hierarchies is needed. So today it is the case that we have a lot of internal talking, internal projects and internal issues that are just up to date with us, but what I'm missing a little bit and what I would change is actually this top-down communication on change. So, what are the next steps concretely now (M18 Company Carl).

4.4.6 Conclusion: Change communication strategies addressing pro-environmental changes and electrification

Table 5²¹, shows the change communication processes regarding pro-environmental changes and electrification, reveals not only that, compared to the communication process of conventional changes at the three case study sites, the communication of electrification has fewer individual steps, but also that the companies use completely new or different communication techniques to communicate electrification.

²¹ See Table 5 in Appendix A of the Appendices shows the specific change processes regarding the communication of electrification

The most interesting finding in this regard is that all three companies seem to abandon their traditional communication processes when faced with the communication of pro-environmental changes and electrification. For instance, the first step in the new communication scenario for Company Albert and Company Carl is to control external media communication, since electrification is a societal and political issue. Consequently, public companies like Company Albert and Company Carl remain in the focus of external media coverage. Like Company Albert's usual communication techniques, managers also try to control external media communication regarding electrification through personal face-to-face conversation between them and their employees. Managers at Company Carl stick to their usual communication procedures, where many channels are used to communicate to their employees, such as the social intranet and personal conversations aimed at leading to greater employee involvement. Since Company Bertha is not faced with as much attention from the media, their first step of communicating electrification usually consists of forming a project team that oversees the communication tasks regarding the new changes. This step is indeed the first activity in the entire change communication process at Company Bertha once a change idea has been formulated.

Unlike in Company Carl and Company Albert, it was not often reported in Company Bertha that employees resist changes regarding electrification. This may be, since Company Bertha applies continuous communication of milestones that represent the set goal of becoming carbon-neutral within the next 20 years. Since Company Albert and Company Carl have similar goals, they also apply communication of pro-environmental milestones. However, compared to Company Bertha, participants at Company Albert and Company Carl reported internal resistance to electrification which was supposed to be overcome before the subsequent milestones could be communicated. Both companies apply similar communication strategies to overcome internal resistance, particularly using transparent and open communication that aims to involve employees in the change process and to increase their acceptance of the change.

When considering the milestone communication of all three companies, it becomes apparent that these milestones are all measurable and target the companies' CO₂ emissions. By reminding the employees of these pro-environmental goals, the companies make themselves accountable for their actions and employees can always follow the change progress.

When managers at Company Albert communicate electrification, they aim to apply a strategy where a tactile approach is used to show their employees by means of their products how electrification will impact the future of Company Albert, its products, product development and production. Unlike Company Albert, the products of Company Bertha are mostly electrified, so the managers' strategy aims to create pro-environmental automatisms for their employees, which in turn should enhance the overall ecological performance of Company Bertha. These automatisms must be demonstrated and 'lived' by the managers in order to represent Company Bertha's pro-environmental intentions as good and striking examples.

Managers at Company Carl explained that their electrification communication approach is not different to their usual change communication and relies on simple top-down communication which aims to reach all employees. This top-down communication which participants at Company Carl dubbed 'waterfall communication' is essentially textbook top-down communication, where one management level communicates to the next one below until all employees are informed by their team leaders. This communication strategy can be explained by the fact that most employees at Company Carl are manual workers who do not have a company e-mail address or a company computer and thus rely on verbal top-down communication to get all information about current changes and management decisions.

4.5 Managers' perceptions of pro-environmental change communication and communication of electrification in German automotive companies

As shown in the section above, managers at the different case study sites use various communication approaches to convey messages to their employees regarding electrification-specific messages. This thesis therefore aims to identify how the communication of electrification is perceived by the participants who either communicate or receive electrification-specific messages. In the first step, the managers' perceptions regarding the communication of electrification shall be presented, followed by the findings regarding the employees' perceptions.

4.5.1 Communication of electrification as a recruiting and marketing strategy

It became apparent that some managers at Company Albert primarily perceive change communication of electrification as a way to present Company Albert to the outside world as a green employer and company. Furthermore, internal communication of electrification is a topic that has the potential to motivate a certain demographic group to work for automotive companies. Especially young people and newly graduated students perceive electrification as a motivating factor. Managers of Company Albert use their internal communication of pro-environmental measures and electrification to indirectly present themselves as an attractive employer,

Especially in the area of ‘recruiting’ this plays a major role, because this [electrification and green mobility] is of course an absolute top topic, especially among the younger people. They want to work for a company that is up to date and where they can also have a good feeling about their work (M1 Company Albert).

In general, managers at Company Albert are happy with their communication approach and perceive it as very suitable to deal with the new requirements of electrification and pro-environmental changes,

I actually believe that we as a company are really good in the things that are new, which are perhaps also particularly suitable and predestined for the target markets EV [Electric Vehicles]. We also communicate this very well internally from my point of view. That’s also something you can decorate yourself with (M2 Company Albert).

Since the European Union and the German Government require all automotive companies to conduct annual sustainability reports, some managers at Company Albert reported perceiving the communication of pro-environmental changes during electrification as a way to prepare the company’s employees to act sustainably in an environmental context. At the same time, they wished for the company to do well in the sustainability report and consequently to reach the proposed environmental goals of the governments,

And of course, we have to communicate that within the company. I also say to them: people are looking at the fact that we can’t use so much water or that we use that, that

and that. Because afterwards, when we have worse figures than last year in the Sustainability Report, we look bad to the outside world. That is bad! (M4 Company Albert).

Nonetheless, even managers often question the new communication practices and the extensive investment requirements regarding new technologies.

I would definitely say that me and my colleagues who work on these new [electrified] products, we have many thoughts that go in the direction: does that all have to be now, that we communicate this and that we invest in these new products? (M8 Company Albert).

As has become apparent in this section, especially managers from Company Albert perceive their internal communication of electrification as a means to be attractive to a younger demographic group, enabling them to recruit more graduates in order to cope with the rising technological demands of pro-environmental changes. This can be explained by the fact that Company Albert as a small automotive supplier not located within a city centre is struggling to be perceived as an attractive employer to younger people.

4.5.2 Change communication of electrification: Pro-environmental change communication does not reach all employees

Two managers reported perceiving that the current change communication is not planned thoroughly and thus does not reach all employees with striking messages. This can be explained by the fact that some managers must react quickly to new pro-environmental legislation, which means that change communication addressing electrification cannot be planned in advance or cannot be included in the current change communication processes,

So, there's no, there's simply no big overall project management or change management strategy. It's more like - we're just doing it now (M15 Company Bertha).

Manager 1 further explained that some employees involved in production are not included in the considerations of the new pro-environmental changes, since the nature of their tasks might not allow them to understand the changes,

It is a difference whether you communicate in the headquarters or whether you communicate at a production site. There, other topics play a role and there you can't fool yourself; these people are just a bit off the charts. This is a different clientele. There are simply a lot of employees in production, which have a level of education that is lower, sometimes quite a different one. So that's certainly very diverse. There are big differences (M1 Company Albert).

Manager 15 also reported perceiving the current pro-environmental change communication as a type of communication that is sometimes formulated as orders, which in his experience, had never worked before with other change communication strategies,

But I myself actually experience it in such a way that with the [pro-environmental] goals that we have implemented here at the site. If you try to communicate these with these methods where you use signs and commands [...] People do not care for that at all (M15 Company Bertha).

4.5.3 Perception that only clear change communication reaches all employees

Other interviewed managers reported perceiving pro-environmental change communication or communication addressing electrification as successful when the communication is clear and reaches all employees. Especially with a very new change like electrification, managers emphasised that clear communication is perceived as the most valuable,

In every change process, one can only convince the recipient and that you are able to take them with you. You need clear and simple [communication] (M17 Company Carl).

It was further explained by managers that clear and open messages have a positive impact on the whole change process, since employees are less likely to resist a change which is clearly presented to them before the integration process of the change takes place.

You have to avoid something like this [resistance]. You have to make this clear beforehand. This means that all meetings must be well prepared, that you can communicate clear messages in order not to make contradictory statements. So, the employees take a clear position regarding the change (M10 Company Bertha).

Manager 10 extended his statement about clear pro-environmental communication by adding the fact that every activity of the management should meet a demand of the employees. Only if these needs are met with certain management activities does the management itself perceive internal change communication as successful,

Employees say: ‘oh that’s great or great that we do this, that you take care of it’. That means there is a great need. And if you cover a need with an activity, with an action, then the feedback is phenomenal, and then the employees are fully on your side (M10 Company Bertha).

4.6 Employees’ perception of pro-environmental change communication and communication of electrification in German automotive companies

4.6.1 Perception of external media communication

An interesting finding in the context of external media communication is that some employees of Company Carl perceive external change communication as more profound than internal channels. Thus, they reported that external channels offer them more information regarding electrification than internal sources. Employees at Company Carl perceive that external channels, such as magazines, allow them to stay up to date since communicators at Company Carl often do not share important information with their employees. The strain of day-to-day business can also impact the communication of electrification since electrification is not the only pressing factor for Company Carl. As the media has a great interest in electrification, employees likely obtain required information from such sources,

I’d say, I have already heard this in several departments, you should always read the Manager Magazine and the ‘Handelsblatt’²², because they always know more than our Company. And that’s also true, if you subscribe to all these magazines and read them,

²² German manager and business magazine

then you stick out, because you are always updated on what is going on at Company Carl, before Company Carl even communicates anything to you (E16 Company Carl).

Employees of Company Carl were found to value all change-related information. In this context, external media communication was described as a relatively new source of information that is often accessed by employees and followed up by internal information communication,

So, sadly we learn about big changes through the media. That is relatively new however, a few years ago you learned about all that from your colleagues, today you learn most from the media. And after that they send these messages over our internal intranet (E13 Company Carl).

Information obtained in advance via newspapers makes employees question the managers' positions and wonder which changes are planned in the background without being communicated by their leaders, although the changes could negatively affect the employees,

So, in the case regarding the 1000 layoffs of management positions, as I said, we read this in the newspaper before it was officially communicated by our CEO. That was not great, it did not affect me in this case since I am not a manager but of course I found it questionable from the course of action. Because if you get along with the executives who you always believe as a normal employee that they are closer to information, that they know more, but if that's how it goes, I have to ask myself: what is planned in the background, and what could affect me directly? (E14 Company Carl).

The experienced uncertainty of employees resulting from media communication is one aspect of uncertainty-creating behaviour mentioned by the employees. In addition, external media reports on the company's success contradicting internal news shared over the social intranet also leads many employees to question the sincerity of their company,

There is a bit of confusion because different things are being communicated. That's definitely the case. We had it on the intranet. You have an article on the intranet that is written by the company, where it says: hey we have great numbers, the last quarter was the best ever. And then you click on two more articles, and you find an article from Research and Development where they say: oh God, we have to save, we have to invest in corresponding areas (electrification and e-mobility), we just don't know where the

money is supposed to come from etc. So that was definitely a moment where you could say: we all didn't know what to believe now? Do we have money, or don't we have money? (E16 Company Carl).

The reported confusion experienced by Employee 16 regarding external media communication intensified when news articles appeared indicating that, because of electrification, 1,100 managers and 10,000 employees would have to be sacked. External sources communicated this development before internal communication could take place,

What starts now, or what has been communicated is that we must cut or reduce 1,100 managerial positions. That critical part about this communication at the time, was that it was already in the newspaper, I believe in the 'Handelsblatt', before it was communicated internally. So, the official message from the CEO was only presented, 2-3 days later or something. But it was already in the newspaper! So that was definitely leaked. Then it is the case that 10,000 employee positions are about to be cut. There is no more external recruitment. People who are starting to retire, or change are not being re-staffed, individual payments are unlikely to take place as before. So, these are the first measures where you actually notice the effects of electrification. 40 hours contracts are reduced etc. But no one says that this is actually because of electrification. That's communicated, maybe, at deeper levels. But we do not put this on the front page (E14 Company Carl).

Employees at Company Bertha reported that the current change communication regarding carbon neutrality and electrification is 'too little' and not widely spread within Company Bertha. Considering the size and organisational structure of Company Bertha, many employees are likely to learn about changes early on, while others might be informed only later through internal change communication. Thus, it is likely that some employees will receive pro-environmental change-specific communication later than others through external sources and thus perceive internal communication as less extensive and detailed,

So, I only saw it once in the newspaper, I think in the BGN, but otherwise it wasn't communicated much here (E6 Company Bertha).

For employees who do not value pro-environmental changes as much as others, external media communication containing messages about electrification is considered irritating. For these employees, other environmental issues are more pressing, so the extra communication of electrification that happens outside the company is considered too much and not targeted enough at what these employees perceive as more pressing environmental issues. However, most other pro-environmental actions cannot contribute directly to the company's internal CO₂ reduction goals,

Important. Important. While I have always thought, so [...], in the current debate in general, now not only in the media, but I am also a little annoyed that there is a lot of concentration and focus on it. So, I think there are many other issues, environmental issues that should be addressed, that starts with the plastic story, that starts with, species extinction, bee deaths, someone spraying gene mutants in the fields. I think at the moment it is a bit too hyped and too much focus is put on it and I have a feeling, we forget a few other things that we might be able to reach easier and faster. So, I think the mix isn't quite present. And I think, and I personally think as an employee of Company Bertha, you can of course probably work a lot on the matter, especially in the automotive sector, but I think there are also other things that can be tackled as Company Bertha on a smaller scale (E5 Company Bertha).

4.6.2 Employees' perception of information communication

Employees and managers at all three case study sites mentioned that information communication during all changes is immensely important to them. In the context of electrification, many employees are concerned with receiving as much information about electrification as possible, thus it was reported that they even go to other departments and colleagues to ask them whether they know more than themselves. This is of course dangerous because actions like this can spread wrong information. However, when experiencing a lack of information, employees will resist changes from the very beginning,

So, if you know there's something coming up, you start talking to people. Of course, you want to find out what the matter is. The danger in that, of course, is that you end up collecting more rumours than actual information (E17 Company Carl).

Other employees acknowledged the fact that internal information communication is substantial and thus appreciate that their companies and colleagues understand the importance and the need for electrification,

Generally, now with the shift towards electromobility, there is much information available. So, I wouldn't say that there's an article on the intranet every day. But I mean, you can't just say, 'Oh, we've electrified a new car series now.' Or a hybrid, or what do I know. But there are many, many small issues or topics that you can communicate. I think that is very present. And simply because there is this need [to change], I do not think there is much discussion about that. I think everyone understood that (E17 Company Carl).

In this regard, managers often described information communication as necessary transparency which means that changes are often accepted when information is provided. It became evident that this is also the case with the communication of electrification and the employees' need to obtain all information about the current changes. Therefore, an initial hesitation can often be observed among employees when a change is communicated at Company Bertha, simply because the management does not have the chance to communicate all information from the very beginning,

Sometimes people tend to be a bit hesitant to watch what's really coming up and how it affects them personally. But I think what is more important is the transparency that is given or not given in this process that kicks off a change like this (E8 Company Bertha).

Other employees of Company Bertha complained, however, that information communication does not allow for employee involvement. Employees and managers value the involvement of all parties. However, the involvement of employees in information communication is difficult because the objective of this type of communication is solely to inform all staff. Since employees are likely to resist when they are not involved in change and are not informed properly, a mixture of both communication approaches needs to be applied when communicating changes regarding electrification,

So, there were even information events at different steps [in the introduction of the change]. So that wasn't bad in itself. However, it was said that everyone can somehow

help shape the change. And that was not the case in the end. In the end everything was decided by a project team (E6 Company Bertha).

4.6.3 Employees' perception of change goal communication

Some employees at Company Carl reported perceiving the change goals to become carbon neutral within the next 20 years in a less enthusiastic way than their manager group. These employees especially question the underlying short-term processes for reaching the proposed goals and the sincerity of the pro-environmental goals,

I think the problem is that that has been put in the room, this date. And now in the background everyone is pancaking and running around desperately trying to set these short-term goals. What we're doing tomorrow? What we're doing the day after? And I think Company Carl is bad at setting short-term goals but so far it has managed every X years to get a new car line on the street. So I think, 5 minutes before the end Company Carl gets this somehow done, but until then, there will be chaos (E16 Company Carl).

Other employees stressed the fact that becoming carbon neutrality within the next 20 years is unrealistic since internal company processes regarding car development work in different timeframes, measuring time in car generations,

Yes, that's not that much time [20 years]. When I think about how far we think and develop in advance and where we are today, I mean that's the whole industry that's not just the case with Company Carl now. At BMW, the next generation 3 Series BMW will already be in the planning, just like us. So that's why I find this date - yes 20 years. That's only two and a half generations. Or almost three generations. And as I said, the next generation is already ready or at least in the final stages, so I can no longer change something with that. Then I have only two car generations left. That's not much. That's not a lot of time. What do I think of the goal? Is CO₂ really the big problem? That is the big question I am asking myself. And is it really the exhaust gases that come out in the back of the car? (E15 Company Carl).

It has to be added that goal setting is not a cure for all resistance to pro-environmental changes, as was observed at Company Carl. In addition to Employee 15, who doubts that there is enough

time to become carbon-neutral within the next 20 years, other employees question carbon neutrality as a concept and perceive this as an unrealistic change,

So yes, I mean they promise that. You have to believe that or not. I do not know whether this is achievable. I don't think so. CO₂ neutrality also means that I have a factory that supplies itself, yes. With solar energy or something. I hope we do the right thing. But I'm not so deeply involved in what's coming up with future construction projects (E13 Company Carl).

Employee 13 further stated that he wishes there were a milestone plan for the pro-environmental goals which outlines short-term goals for achieving carbon neutrality within the next 20 years,

In 20 years, we want to become CO₂ neutral, then we are now slowly looking at that [goal]. So, I doubt it. But I, so if the bosses say they can do it, then yes, then there will be something [feasible] behind it. I'm missing the presentation of the intermediate steps within these 20 years. That's a far-fetched goal, there's a lot to promise. But with such a goal, with such a project. I'd say, it has to take 5 years. You have to say, hey, where do we want to be in 5 years? Because the current executives, you can't assess their actions by asking what's going to happen in 20 years. Simply because that there may be different executives then. But you must take intermediate steps and say where do we want to be in 5 years. I would like to say that 25% of what we want to do in 20 years, should be done within 10 years, 50% five years later and so on. I am missing this plan a little bit (E13 Company Carl).

Employee 13 also criticised the missing short-term goals regarding Company Carl's carbon neutrality plan. This proves that internal change communication regarding pro-environmental changes is not efficient at Company Carl, even though, Company Carl's management has designed a precise pro-environmental goal plan,

This means that we must achieve a 15 percent CO₂ reduction by 2025 across the entire fleet. Then by 2030 we must have a 30 percent reduction in CO₂ emissions. So, in other words, there are already shorter objectives, which we are clearly working towards the overall goal. [...] And broken down from that, where do we now put our limited

development capacity to deliver the greatest added value for this 15 percent, 30 percent and so on? This means that we also must focus consciously (M20 Company Carl).

This applied strategy by Manager 20 is almost identical to the process proposed by Employee 13, who reported that he wishes for more measurable short-term goals. Thus, a lack of transparent change communication regarding achieving carbon neutrality within the next 20 years is present in Company Carl since a short-term goal strategy has been set in place but has not been sufficiently communicated to the employees.

Managers at Company Bertha, which also has the objective of becoming a carbon-neutral organisation within the next 20 years, use this change goal to try to overcome resistance and make everyone's contribution to the change topic clear. In contrast to Company Carl, employees of Company Bertha reported that their managers offer so-called internal 'break plans' which essentially are milestone maps that dictate when specific goals have to be achieved in order reach carbon neutrality. According to Employee 1, these well-defined and smaller goals are the most significant motivating factor for employees and a suitable instrument for preventing or overcoming resistance,

So, we actually achieved this in two or three aggregations. Generally, we use a 'break plan' which defines when we want to achieve something. And the second thing is, in our working groups regarding Leadership, Process Methods or Collaboration, we always use two-week sprints. There we use agile working methods where we set ourselves feasible, achievable, and measurable goals. This motivates the employees because they see the change and say: 'wow that's new and I see the added value that I have provided.' That is motivating! (E1 Company Bertha).

Small achievable goals were reported to be motivational by employees in the other companies as well. However, goals designed to be individual goals for employees were reported to have an even higher motivational impact than general CO₂ reduction plans, for instance. Personal goals were found to be especially motivating for employees when established together with superiors on a trust-based relationship,

I think so because, these goals that are actually suggested. I think the communication with my boss was a bit difficult at the beginning because we didn't have the level of

mutual trust that we have now. I think this is something you gain over time, but now I think, now that we have this mutual trust, I think that when I suggest something to improve my own work, it is actually validated from him and he says: ‘ok: let’s put that down as your own goal for the next year.’ (E2 Company Bertha).

When it comes to pro-environmental changes, Employee 3 explained that these changes also have an impact on the employees’ personal lives, since CO₂ affects the environment and is a driver of global warming. Therefore, pro-environmental goals applied at a company could inspire employees to think about implementing pro-environmental measures in their private lives, which would result in even more CO₂ reduction,

So, yes, of course. Since there is also a personal opinion linked to this subject regarding the environment, regarding the topic of a global footprint, CO₂ and the future for our children etc. Because this can of course also be a guide for us [as private persons]. If a company sets a [pro-environmental] goal you ask yourself, can I implement all this in my private life then? (E3 Company Bertha).

4.6.4 Employees’ perception of newly applied communication channels to communicate electrification

Employees at Company Bertha are not convinced that the strategic aim of their management will create automatisms for them. They proposed that a strategy unified strategy for Company Bertha would be more beneficial and thus, not make employees reliant on ‘automatisms’ that are exemplified by their managers. They also pointed out that the impacts of electrification and carbon neutrality on the automotive departments are much more significant compared to other business units. Thus, the employees proposed that every business unit define the meaning of the change for itself,

There has to be a meeting where the headquarters and the business units and project managers from every business area come together. In this case, each business unit would derive the main topic for discussion for itself asking: what does that mean for us? That would make sense. So, production sites of course are affected and so on, but purely as far as our products are concerned. Probably the impact on the automotive industry [and the corresponding business units] is much bigger I believe (E5 Company Bertha).

Employee 4 also explained that established communication methods are perceived as reliable, since they have worked in the past. Moreover, during internal changes or transformations all employees must be reached with the same information. Hence, the new way of creating automatisms is considered rather negative by some employees of Company Bertha,

I think I would continue to use the same methods that are available. Especially the [communication] platforms that are already used. Like, regular town halls or Company Bertha direct [social intranet]. Because I think it's a platform that all employees look at and visit and I don't think we need to start with a new platform now. We can just use what we've already used the last few years, through the last transformation, to inform [employees] (E4 Company Bertha).

4.6.5 Mistrust of employees towards the communication of electrification

One pressing issue that was found during many employee interviews was that, in general, employees at Company Carl and Company Bertha distrust their managers' communication of electrification. Most of the interviewed employees even doubt whether electrification is a feasible change, and these doubts also create mistrust towards the managers' communication of pro-environmental changes and electrification.

Another issue at Company Carl which leads to employees' discontent is the setting of poor examples by their respective managers. During times of electrification and pro-environmental changes, employees expect from the management a certain pro-environmental behaviour. However, some managers of Company Carl fail to comply with pro-environmental standards and thus set a poor example,

You always look up to your boss. And they fly to Munich. And now well, I don't know Munich. In our department, they now fly to Las Vegas three of them [on company expenses]. So boss, sub-boss and executive. Where I say, must that be? What is the corresponding mission statement? How do I stand in front of the team? And there is much talk about it, preach water, drink wine. And we already lack the appropriate orientation [regarding pro-environmental questions]. Well, it's always the question, there's already growing resentment. So, the question again, this is very important: if I want to save something I have to act as an example (E13 Company Carl).

Not only are certain communication measures perceived as hypocritical, but it was also reported that some managers at Company Carl do not communicate in a fully truthful manner with their employees. The issue is that jobs must be cut in order for Company Carl to save money for the new engine developments for electrification. Of course, many industries and companies are often faced with tough decisions like this. However, at Company Carl the initial change communication regarding these changes was unprecise and not completely true. This infuriated many employees and even now it is not clear how many jobs will be cut in total, which leads to employee distrust towards any further top-down communication regarding this matter,

So, I don't know how it works in production, but what I've seen now is that a lot of team leaders or department heads are trying to reassure their people. But it's um, as you say, there's general distrust here because it's not really clear to us, how much is being saved in terms of jobs. We've heard different things, but the official ones are only the 2,000 management positions that are to be cut, but that's not clearly communicated (E16 Company Carl).

Distrust in the management stems not only from communication regarding possible job cuts, but also from the internal reorganisation caused by electrification. At Company Carl, many departments are now being shifted to other overarching business areas, leaving many managers without teams and vice versa. The internal restructuring causes employees to lose trust in the communication of the management because most changes happen overnight and are not announced sufficiently,

But the really explosive thing is that compared to, for example, the last crisis [2008], last time it was a general crisis that has affected all sectors of the economy, now it is just this economic sector or just the car industry that is really affected now. People are slowly worrying about how this is going to continue. I actually find the more explosive thing now that people say: is this more explosive than an organisational restructuring? Incidentally they now say that 1,100 executive positions are being cut, accordingly. Now in the course of this reaction my team has been assigned to another department. Purchasing is no longer an executive reporting department, but it is now assigned to R&D. So, there is a lot of organisational restructuring (E14 Company Carl).

Employees at Company Bertha perceive pro-environmental changes as beneficial for them and their organisation, their distrust is mostly not directed towards new pro-environmental measures, but they rather question the communication methods used by their management. Thus, the employees complained that they cannot see the connection between the communication of pro-environmental measures and the context in which they will be implemented. Moreover, further confusion is created since important information is missing in the official communication,

It was once communicated in the Company Bertha-Connect [social intranet]. Company Bertha becomes CO₂-Neutral. And it has now been communicated to the head of departments (by executives). Otherwise, there was no project communication in any official form, except that of course individual activities or individual topics are communicated or come to realization. But there is no connection between the activities and a greater plan, no one knows, I would say. So, I didn't notice what the context was. I didn't even know that there was a central project team that takes care of it (E12 Company Bertha).

Missing information leading to distrust is also an interesting finding of this study. Employees in general might become concerned about their company's future if important information is missing in official change communication. Thus, some employees who cannot access all sources of information are very concerned about achieving carbon neutrality because they simply do not know how the respective changes are realized and implemented. If this understanding is missing, employees jump to quick assumptions and believe that a whole mission of Company Bertha like carbon neutrality is simply 'corporate greenwashing' to gain public admiration,

So, I have the impression that the goal to carbon-neutral in 20 years is unrealistic, impossible, since it's not far in the future. I hope anyway, that hopefully we are not so far away from reaching the goal however. I can't imagine how you want to implement it in [this] time. But I don't know. I'm just saying my guesses. I'm worried that this is just an announcement to look good for the public, but I don't know how much substance there is behind the goal (E9 Company Bertha).

When employees realize that the communication is missing important information, they first tend to distrust the management. Later, however, employees will even go further in their distrust and will question the whole change venture and its future. Employee 5 of Company Bertha for instance complained that there was no information event for him to attend, and therefore, he and his colleagues do not know what the future of their business unit will look like. Since he is unaware of how the change will affect him, distrust and uncertainties emerge,

So, I have to admit, that's where I actually think it's a bit unrealistic. I think it's going to be very difficult, and it goes back to what I just said before: I think that even if there's a general discussion in the whole car industry, at the moment, that there's a bit too much focus on pro-environmental discussions. So, I think there are just other things that you have to pay attention to, and pro-environmental changes are partly not thoroughly thought through to the end. Carbon-neutral is a Company Bertha project. I think these are quite different challenges. I'm selling something like this to my whole company something like that. I'd say, the only thing I'm going to do is if I just happen to look at the intranet and read something about it in the newspaper. I would now also say, spoken from my view, it has also not really arrived with us yet in the sense that a [project team] makes an information event for us and says: hey listen, if you are interested, come on, we'll show you what Company Bertha has planned for you and what does this mean for your Business Unit (E5 Company Bertha).

4.6.6 Conclusion: Communication of pro-environmental changes

An interesting finding regarding the communication of electrification was that managers and employees at all case study sites reported that they regard perceived media communication about the internal change of electrification as helpful whenever it conveys messages to the intended recipients. However, external media communication could also have the potential to manipulate the recipients by fearmongering or by leaving out important information. Managers reported that these external channels and their communication must be controlled in the very first step when communicating electrification.

Moreover, the general perception of electrification was mostly reported to be negative, except for participants of Company Bertha, where many employees reported welcoming electrification. Almost all managers explained that in the next step of communicating

electrification, potential employee resistance to the concrete change of electrification should be addressed, including resistance to organisational and task-based changes caused by electrification. Managers also reported that they apply open and transparent information communication regarding electrification, which has the potential to overcome resistance, a dynamic also used during the communication of conventional changes. In the specific case of electrification, however, managers at Company Bertha and Company Carl explained that after transparent and open information communication, another communication strategy must be applied, namely the communication of specific goals showing the recipients the strategic direction of electrification. These goals are mostly measured by the companies' overall ecological performance regarding CO₂ emissions which constitutes a measurable control figure, making them accountable regarding the proficiency of their changes and ecological actions. Company Carl and Company Bertha, both set themselves the goal of becoming carbon-neutral companies within the next 20 years, a goal fundamental to their internal communication of electrification. In comparison, Company Albert, as a much smaller company, did not set a specific goal to become carbon-neutral, so their approach to communicating electrification does not include goals but rather uses a tactile method that includes their produced parts as the key component of their communication. Company Albert also makes itself accountable through presenting their parts that make mobility cleaner as a key component of their communication. Employees of Company Albert can thus always double check whether more ecologically friendly parts are built into new cars or not, so they can know to what extent Company Albert has an increased positive impact on the environment. Managers at Company Bertha also use a communication strategy that can be included in the category of tactile communication, namely the creation of automatisms for their employees, where they must act as role models regarding ecological performance, inspiring their employees to act in the same way.

After using internal, transparent information communication and their specific goal setting for electrification, managers at Company Carl reported using their internal hierarchical structure to communicate electrification, a procedure which is called waterfall communication. This specific type of internal top-down communication aims to reach every employee and every department through their respective managers. Of course, this communication approach is nothing new or extraordinary, but considering the size of Company Carl and its internal organisational structure this type of communication has indeed the potential to inform all employees, especially manual workers who do not have a company email address and therefore are not granted the same access to information as employees in office jobs.

It became apparent at all three companies that the communication of electrification is fundamentally different from the communication of conventional changes. While the channels used for communicating electrification might not greatly change compared to conventional change communication, the conventional change communication processes of all three companies are not applied when communicating electrification. It even seems that the companies merely react through their communication instead of presenting a clear direction. This, of course, can be explained by the ever-changing regulations dictated by politics. On the other hand, it is still fascinating that Southern German companies that create processes for every single business task do not have processes for the communication of electrification. Furthermore, it is interesting that goal setting as a fundamental part of German corporate strategy does not foresee the communication of milestones, but rather sets a goal which is 20 years away without presenting further steps or a direction. Other communication concepts that are extensively used during conventional change communication at the three case study sites, such as town hall meetings, emailing or face-to-face talks, are not present during the communication of electrification. This leads to the creation of new channels, such as tactile communication, which is, as a concept, completely new to employees as well and thus constitutes a change on its own. Moreover, companies like Company Carl, which present themselves as being firmly in control of all changes at their sites, reported embracing external communication channels and their content about electrification without having an influence on the presentation of news. This creates more work for them when it comes to controlling internal resistance created by external media coverage. Therefore, even more internal employee resistance to electrification emerges because the companies abandon their conventional change communication strategies and thus create even more uncertainty among the recipients of their communication regarding electrification.

This statement is confirmed by some employees of Company Carl who stated that, in the context of electrification, external media communication is valued higher than internal communication, since external channels at least give information to the employees regarding the current strategic orientation of their companies while adapting to electrification. Moreover, some employees of Company Bertha and Company Carl complained that sometimes internal information communication is ambiguous and unclear, especially when managers communicate how many positions must be eliminated due to electrification and what groups and how many managers or employees will be affected. Furthermore, the employees perceive the internal

communication of goals regarding electrification as very unclear since important intermediate steps are missing from the presented goal communication. Employees at Company Bertha also reported perceiving new communication measures like the creation of automatisms as very unsatisfying and wish that the management would rather apply the old communication methods as they are still used when conventional changes are communicated. This again shows how employees mostly experience uncertainty through the new communication measures used for the communication of electrification. Furthermore, many employees reported having a general mistrust towards the communication of electrification. Often, new communication measures in general are seen as attempts by the management to be put in a better light, to gain more positive political and public attention. This can again be explained by the employees' lack of trust in the new communication methods that are used during the communication of electrification and other pro-environmental changes.

5. Chapter Five: Discussion of findings

This chapter will focus on this thesis' findings and contextualise them in a discussion using relevant literature. First, the findings regarding conventional change communication in the three automotive companies will be considered, followed by a discussion of the findings regarding the participants' perceptions of electrification and its communication. Finally, this chapter will discuss the findings in relation to the communication channels used by the three companies to communicate the new changes provoked by electrification. This is to see how they differ from conventional change communication practices and how they are ultimately perceived by the participants in the respective embedded units of analysis.

5.1 Main findings on conventional change communication

5.1.1 Process-driven change communication of conventional changes

When considering this thesis' findings regarding the communication of conventional changes, it becomes apparent that all three companies use a process-driven change communication approach, in which precise communication strategies and channels are established to communicate to employees. The literature addressing conventional change communication

states that following a process when communicating changes is a common strategy for companies (Galpin, 1996; Kanter et al., 1992; Klein, 1996; Kotter, 1996; Luecke, 2003; Nelson, 2003).

Comparing these findings to prominent change examples in the literature, where other companies underwent internal change, it becomes apparent that the literature seems to have identified that successful internal change requires overcoming fear and communicating a common mission (Morrison, 1993; Richardson & Denton, 1996). An internal change at the automotive OEM Chrysler in the 1990s is taken as a prominent example where the automotive company faced a culture change that provoked employees' fear of job loss. To overcome this fear, internal communication processes were used to remind employees of the common company mission. Therefore, it can be stated that process-driven change management is a tool that has been used for at least 25 years in the automotive industry. Another example is the internal change in 1994 at Delta, which was the first company to apply an internal change communication process that specifically focused on decreasing fear and uncertainty among employees by using defined communication steps. Delta used a kick-off event in Atlanta which was followed by telephone communication where employees all over the world could call the headquarters and thus obtain information about the change and its effect on their specific positions (Delta Air Lines, 1994; Richardson & Denton, 1996).

The change examples presented above took place in the USA in the 1990s, whereas this thesis examines recent change communication in Germany. However, the literature suggests that process-based change communication, where predefined communication channels and content are defined by the management, allows companies to better deal with internal uncertainty and fear. Based on this thesis' findings and based on the current literature, companies still apply process-based change models and change communication to cope with the challenge of change itself as well as with employee fear and uncertainty (Cram et al., 2016; Fdhila et al., 2015; Hagger et al., 2020; Jones & Harvey, 2017; Varney, 2017). In the literature review, the questions were raised, whether the three companies use process-based change communication for conventional changes. It can be stated that the three automotive companies are very process-driven in their conventional change communication and do not show much flexibility in their communication approaches. This thesis has found that all considered companies have strict, defined processes for conventional change communication and have defined processes for almost every business task to give their employees guidelines and a sense of security. It can be

concluded that the general flexibility of communicating conventional changes, however, may be negatively affected by pre-defined communication processes.

5.1.2 Communication channels used in conventional change communication processes

Pre-defined communication processes would not work without the appropriate communication channels to convey messages to the employees. This research has thus found that the three companies apply a different set of communication channels. However, the three case study sites considered some communication channels as more important than others and had different understandings of what certain communication channels and their purposes are when used to communicate changes.

Company Albert, for instance, as the smallest company valued face-to-face communication the most. Company Bertha's manager and employee participants reported considering town hall meetings as the most important communication channel when communicating changes. Company Carl's manager participants emphasised on applying a mix of communication channels when communicating changes.

Manager and employee participants across all companies usually distinguish town hall meetings from personal face-to-face communication on the basis that town hall meetings are monological, whereas personal face-to-face communication is dialogic. Therefore, in comparison to the general understanding of dialogic and monologic communication, the communicators, and recipients within the three companies have different perceptions regarding the nature of specific communication channels. This thesis has found that, unlike other studies' participants' understanding of dialogic and monological channels, the participants here only attribute a dialogic perception to channels that include verbal communication and personal face-to-face communication (Capriotti et al., 2021; Kent & Lane, 2017; Kent & Taylor, 2002; Wu, 2018; Zare & Tavakoli, 2017).

While perceiving some channels as more valuable than others, participants of all three companies are subject to a communication process that is applied whenever changes are communicated. The finding that companies apply change communication processes is not new and is often and widely discussed in the literature. The change communication principles of the three companies show many similarities to the developed change communication processes

established by Klein (1996) and Kotter (1996), who state that face-to-face communication is the most effective and that information and knowledge about the change need to be communicated to employees, in order to reassure them that the change has positive effects on the company. Previous research has established that change communication processes are valuable for companies in ensuring the success of organisational change, and internal communication in general, by structuring the internal communication as a process-based communication tool which focuses on the application of a variety of sources that aim to increase employee satisfaction and involvement (Men, 2014, 2015; Schulz-Knappe et al., 2019; Tourish & Hargie, 2009; White et al., 2010). Moreover, the companies' applied change communication repetitiveness and consistency were equally valued by managers and employees from all case study companies, a finding which is in line with the extant literature (Bratton & Gold, 2017; Klein, 1996; Kotter, 1996; Young & Post, 1994).

The applied communication channels that are used by all three companies in this study are very similar to those identified by previous research, which states that information-rich, face-to-face channels should be used by leaders to communicate to employees. Moreover, internal change communication should provide all information by using a variety of communication channels (Men, 2014; Richardson & Denton, 1996; Schulz-Knappe et al., 2019). While the findings of this thesis suggest that leaders at all three companies most frequently tend to use verbal communication, previous research found that written monologic communication like email and social media channels can also facilitate positive employee perceptions of internal changes (Malik et al., 2017; Men, 2015; Men & Tsai, 2016). These studies have found that if the written channels allow the recipients to access the right amount of information and engage in an exchange during the change communication process, communication in writing can be as effective as verbal communication. However, most manager and employee participants of all three companies reject the idea of using written communication during changes even though written communication is part of their general communication processes.

5.1.3 Importance of information communication

Regarding the communication concept of information communication, this thesis has found that all employee and manager participants strongly emphasise the communication of change-specific information. Managers and employees described information communication as a concept that strictly focuses on the core information of a change. The employee group

especially requires detailed information about upcoming changes. Managers at all companies have reported that missing information can lead to employees applying defence mechanisms in order to express their resistance towards the change. The most prominent employee defence mechanism triggered by missing information is an excessive use of asking their management questions. This defence mechanism is used to express employees' resistance towards change and imply that missing information is of great importance to them. In this context, this thesis has also found that if any of the companies do not provide the required amount of information, employees subsequently try to obtain as much information as possible by consulting other company internal or publicly accessible information sources.

The importance of communicating change-specific information is also widely discussed in the change literature, which states that such information needs to be communicated often and precisely, in order for the recipients to understand how the company has to change (Allen et al., 2007; Bel et al., 2018; Daft & Lengel, 1986; DiFonzo & Bordia, 1998; Jimmieson et al., 2004; Kitchen & Daly, 2002; Nisar et al., 2019; White et al., 2010). Similar to the findings in the literature, this research has established that manager participants are aware that information communication is essential for their employees and is thus directly linked to their possible response to a change. However, the manager participants of this thesis were not able to present strategies regarding the nature of the information that needs to be communicated, but rather explained that they try to communicate all necessary information. Nonetheless, what employees and managers deem 'necessary change information' often differs, and therefore uncertainty and resistance can occur. Previous studies have been able to identify specific types of information that need to be communicated during changes. For instance, Kitchen and Daly (2002) specified that employees require either job-specific, desirable information about the enterprise or gossip from the office. While the quality of information might vary between the two communication sources, employees nonetheless focus on obtaining information about the change and are satisfied if they receive any change-specific information (Goodman & Truss, 2004; Kitchen & Daly, 2002). As mentioned above, manager participants of this study stressed the importance of information communication during times of change. However, manager participants, especially of Company Albert and Company Carl, perceive the conventional change communication process as a sufficient means to communicate all necessary information without further considering specific information communication strategies similar to those presented in the literature (Goodman & Truss, 2004; Kitchen & Daly, 2002).

Managers of all three companies perceive certain channels, like town hall meetings, as sufficient for communicating change-specific information. However, during these meetings a lot of topics are presented which are not necessarily entirely focused on change-specific information and therefore can lead to confusion among employees. Furthermore, this study has found that using only certain channels to communicate change-specific information is not perceived as sufficient by employees. Employees of Company Carl especially expressed their need for information about a change at every stage of the change communication process, which means that every communication channel should convey change-specific information.

If companies maintained a high level of information communication, their employees stated that they felt very motivated when managers kept them informed during all stages of a change. This was especially found at Company Berth. However, in most cases, managers only provide change-specific information during certain steps in the change communication process, such as in town hall meetings. In addition to the presented literature, this thesis has found that employees expect that change-specific information is communicated to them during every step of the change communication process and thus require an enhanced transparency in their companies.

5.1.4 Importance of sensemaking communication

Another important aspect of conventional change communication identified by this thesis is sensemaking communication. Sensemaking communication is widely discussed in the literature and is also used in organisations that do not undergo changes. Previous literature indicates that sensemaking allows employees to better understand managerial decisions and actions (Ahmadi et al., 2018; Asik-Dizdar & Esen, 2016; Brown et al., 2015; Colville et al., 2016; Kudesia, 2017; Sandberg & Tsoukas, 2015, 2020; Schildt et al., 2020).

Managers and employees of the three research sites distinguished between information communication and sensemaking communication. They consider information communication to merely convey essential information about a change, whereas they believe that sensemaking communication is a better form of persuasion. The managers of all three companies explained that their employees sometimes require a sensemaking component that explains why the organisation must change. Resulting from the employees' need to understand the necessity for a change, this thesis has found that sensemaking communication is a valuable supplement to

information communication in the automotive companies. When the core information about a change alone is not sufficient for the recipients to be persuaded, a sensemaking angle can be pivotal for the success of a change. As one manager stated, sensemaking can be understood as a way to also establish a sense of urgency for recipients in order for them to understand why any change has to happen and how it will affect the company.

This thesis has found that employees in all three automotive companies require sensemaking components, which must be embedded in the communication process, to see why changes are necessary. This finding is in line with the literature, where the understanding was established that sensemaking during change communication processes allows communicators to manage their recipients' perceptions of opportunities and threats. Furthermore, sensemaking communication allows its recipients to alter their understanding of change and further explore alternatives to existing change problems (Lüscher & Lewis, 2008; Van Vuuren & Elving, 2008; Weick, 1995). According to the literature, sensemaking is often only spontaneously incorporated into organisations after certain events took place (Colville et al., 2016; Schildt et al., 2020). However, managers of the case study companies frequently emphasised that employees need to be constantly involved in the change process. This involvement of employees can be understood as a sensemaking approach since, through their consequent active participation in the change, the subsequent sense underlying the change is better grasped by the employees and thus employee resistance can be managed and reduced.

5.2 Electrification: An epochal turn of times

Compared to other changes, electrification is a change that has emerged from outside pressures imposed on the automotive companies by politics and society. International climate treaties to reduce CO₂ emissions have led governments to heavily subsidise and support emission-free engines while at the same time punishing and restricting the production of ICEs. This dynamic causes electrification to be an unprecedented change for companies since the impetus for the change towards electric engines is not initiated by the automotive industry but rather the result of the sum of public and political perceptions of traffic and car exhausts. A further unusual characteristic of electrification as a change can be found when considering the source of innovation targeting emission-free and electrified drivetrains. As mentioned above, governments heavily subsidise some drivetrains more than others, leading the automotive

industry to react to outside factors rather than internally developing new emission-free drivetrains. This thesis found that the circumstances and the identified characteristics of electrification qualify this change as a crisis for the automotive industry (Kovoor-Misra, 2019)

While there have been other circumstances and changes impacting companies as outside pressures before, for example the 2008 financial crisis, the ‘dot.com bubble’ or digitalisation, the changes regarding electrification are special for various reasons. Firstly, the German automotive industry, was not impacted as heavily by economic crises compared to other industries, which means that the automotive industry, unlike the banking industry for instance, did not have to adapt to outside pressures. The economic crisis of 2008 impacted consumer behaviour negatively and literature at the time observed that automotive companies felt a significant backlash from the economic crisis (Baum & Delfmann, 2010). However, German automotive companies were coined as ‘winners’ of the economic crisis since their diversified product portfolio, containing luxury cars, utility cars, and small city vehicles still appealed to a variety of consumers’ needs. Their innovative capability and diversified product portfolio thus helped the German car industry to overcome the crisis (Becker, 2010). While automotive companies survived the economic crisis of 2008 through their innovative capability, this very trait of German automotive companies is now jeopardised by government subsidies for electric drivetrains. Moreover, the societal pressure and opinion demanding a decrease in CO₂ exhausted by cars leads automotive companies to change towards electrification, since they do not want to lose their positive public perception. This fear of losing their positive public image mostly originates from the effects of the diesel scandal described in Chapter Four. Considering the reasons presented in this section, it can be stated that it will be extremely difficult for German automotive companies not to participate in electrification, which leads to the perception of managers and employees that electrification is an inevitable change.

When analysing the interview data, it became apparent that perceptions of electrification across the three companies vary regarding some aspects, while for other similarities were found. Firstly, participants at Company Albert perceive electrification as a threat and an opportunity at the same time. Secondly, participants at Company Bertha support electrification as a pro-environmental change; some participants of this company even reported seeking possibilities for implementing pro-environmental changes in their personal lives. Lastly, participants at Company Carl perceive the change of electrification negatively and consider this pro-environmental change as causing uncertainty, thereby threatening their everyday business and

the future of their company. Despite these company-specific perceptions, this thesis has also identified certain overarching company similarities within the manager group and the employee group regarding the perception of electrification, which will be presented in this Chapter.

5.2.1 Employees' and managers' shared positive perceptions of electrification

While electrification as a change often leads to uncertainty and fear among employees, this section will present this study's findings regarding positive perceptions towards electrification as a change.

This thesis found that Company Bertha is the only company that has a thoroughly positive perception of electrification. Firstly, Company Bertha has a strong organisational culture focusing on pro-environmental products and environmentally friendly technologies that are developed to support society. Resulting from its corporate culture and broad product range, which already contains numerous pro-environmental appliances, Company Bertha has been able to develop an employer attractiveness which helps them to target young professionals and graduates who want to work for a company that supports the reduction of pollutants through technological advancements and facilitates pro-environmental behaviour through its organisational culture. Additionally, Company Bertha has already produced batteries for almost 40 years that are used for various electrical appliances. Thus, Company Bertha has been able to react to the challenges of electrification and consequently entered the field of electrified drivetrains quickly. In this regard, this study has found that the combination of a corporate culture, focusing on supplying pro-environmental products to customers, and broad knowledge of different technologies regarding electrified drivetrains, are the reasons why Company Bertha's manager and employee participants both perceive the change of electrification as positive. Due to Company Bertha's corporate culture, internal knowledge about pro-environmental technologies, broad variety of pro-environmental appliances and significant focus on electrification, less resistance towards electrification is provoked within Company Bertha.

According to the findings of this study, it can be suggested that there is a link between the positive impact of organisational culture facilitating change acceptance and innovation, as is the case for Company Bertha and its staff. These findings are also supported by previous research (Alas & Vadi, 2006; Armenakis & Bedeian, 1999; Armenakis et al., 2007; Hinings et

al., 2018; Kenny & Reedy, 2006; Qi et al., 2021; Safi et al., 2018; Sung & Kim, 2021; Twati & Gammack, 2006). Furthermore, the literature on institutional pressure provoking companies' green or sustainable performance underlines the findings of this thesis and shows that Company Bertha's management understands their employees' demands for sustainable actions. Pro-environmental actions implemented by the management lead to a positive effect, moderating between employees' demands and the actions taken by the management (Delmas & Toffel, 2005; Wang et al., 2018; Wang et al., 2019). While this thesis has not found that institutional pressure on Company Bertha's management is exercised through their employees, the employees' general attitude towards sustainability motivates Company Bertha's management to implement green policies and products, since their employees specifically seek a company that is sustainable and environmentally friendly (Bansal & Roth, 2000; Chang & Hung, 2021; Dillon & Fischer, 1992; Lämsiluoto & Järvenpää, 2008; Qi et al., 2021; Sung & Kim, 2021). The literature on institutionalised pressure, however, indicates that Company Bertha's management could not introduce new products that would harm the environment, since this step could potentially anger Company Bertha's employees who place great emphasis on pro-environmental products.

5.2.2 Manager-specific positive perceptions of electrification

This thesis has also identified some senior manager participants from Company Albert perceiving electrification positively, since electrification allows their company to enter new markets. However, managers at Company Albert sometimes provided conflicting answers regarding their perceptions of electrification, revealing that some managers perceive electrification as both a negative and a positive change, depending on the scenario.

Company Albert as the smallest of the three case study sites looks for possibilities to diversify and increase its product portfolio. Therefore, electrification offers Company Albert an opportunity to position itself in new business fields, where electrified drivetrains constitute a chance to become a market leader. Even smaller companies can compete in the new markets, since a shorter supply chain is required, and less production capital will be needed to produce electric engines. Like Company Albert, Company Carl also could enter new markets with electrified products. However, compared to Company Albert, Company Carl is a has a larger investment potential. Thus, an expansion from the traditional automotive market to electrified markets would have been possible in the past, even without relying on government subsidies.

Company Carl had not taken the opportunity to venture into new markets in the past because the additional investments would have had to be covered by their own investment budget. Company Albert has a smaller investment budget, which previously limited the company's capability to venture into new markets. However, as mentioned above, the government heavily subsidised electrification, so the management has taken the opportunity and invested in new products.

For these reasons most managers at Company Albert perceive new innovative products in e-mobility as a motivating factor for them and for all staff. As mentioned in the section above, Company Bertha has a corporate culture open to and supportive of innovation and technology. Therefore, electrification is considered a suitable change for Company Bertha and its organisational culture, which supports new technologies and products. In contrast, Company Albert has only recently started growing as an organisation and diversifying its product range.

Relevant to this example is that the literature predominantly shows a link between motivation and innovation. Many studies state that a motivated workforce can enhance a company's innovation and its development regarding innovation (Akhmetshin et al., 2018; Block et al., 2013; Grosheva & Naumkin, 2013). However, this research has found that, in the context of electrification at Company Albert and Company Bertha, motivation can emerge from new innovative products that have to be produced by companies to stay competitive in the automotive industry. While the literature has not established a profound understanding of how pro-environmental products can enhance motivation, previous research stated that environmental performance measurements and pro-environmental motivation are linked together (Danso et al., 2019; Lisi, 2015; Passetti & Tenucci, 2016). In this regard, the literature linking innovation and motivation must also be considered since it states that a motivated workforce contributes to innovation and vice versa (Akhmetshin et al., 2018; Block et al., 2013; Grosheva & Naumkin, 2013). However, considering the nature of electrification and its innovation, it becomes apparent that most of the innovative work on electric engines is mostly found outside of the three companies. Consequently, automotive companies react to proposed technologies and try to incorporate these innovations in their product portfolio. Therefore, electrification as a technological change has an unconventional dynamic where the innovation of new drivetrains is suddenly not fully conducted within companies' R+D departments. This can explain why, in the case of this thesis, the motivation for innovation depends on the

employees' and managers' perceptions of electrification and its pro-environmental nature and not on the actual technology inherent to electric engines.

While electric engines might demand less innovation on the part of companies because of their simplicity, the result of producing electric engines is reduced CO₂ emissions once the cars are on the street. In the context of this thesis' findings and the above-mentioned literature, it can be stated that, ultimately, the emission-free characteristic of electric engines is what constitutes the motivation, especially for participants from Company Bertha. In the case of Company Albert, technological innovations are presented as motivating factors. Still, managers emphasise that electrification must also be considered as a strategy to grow the product portfolio and to enter new markets, thus also considering electrification as an opportunity to gain new market shares in electric mobility (Kovoor-Misra, 2019).

5.2.3 Employees' and managers' shared negative perceptions of electrification

This research has found that manager and employee participants, particularly at Company Albert and Company Carl, perceive electrification as an outside pressure on their companies which impacts their way of working and their freedom in choosing their own strategies and business tasks. For example, the participants perceive that outside pressures regarding electrification dictate product strategies and thus interfere with the innovative capabilities of the companies when it comes to engine production, business, and sales strategy. Managers and employees felt equally frustrated that the new requirements are imposed on them by decision-makers and the society possessing less technological expertise than the respective R+D departments.

Exercising pressure on companies to change and adapt to a more pro-environmental business focus is a fairly new phenomenon, since climate concerns and pro-environmental thinking have only been part of the wider public consciousness for the last two decades. Previous research has established that some outside forces might exercise pressure on companies and demand them to become greener and more sustainable (Contrafatto et al., 2019; Fernandez-Feijoo et al., 2014; González-Benito & González-Benito, 2010; Helmig et al., 2016; Lee & Kim, 2021; Wolf, 2014; Yu & Choi, 2016). In turn, this can influence the management to react by submitting to public opinion or other external forces such as politics and new legislation. To meet the demands and requirements of public authorities and other stakeholders, the literature has established that

many companies implement various green strategies and mechanisms such as the ISO14001 norm (environmentally friendly management practices), sustainability reports or, in this case, electrified car parts and car fleets (Bansal & Roth, 2000; Callens & Wolters, 1998; Dias-Sardinha & Reijnders, 2005; Lämsiluoto & Järvenpää, 2008). Submitting to green outside pressures is not an anomaly for companies. However, the literature presented above mainly establishes the understanding that companies would rather submit to green production norms or green initiatives that allow them to use green electricity for production processes. The literature has also shown that companies often focus on smaller pro-environmental measures that do not directly affect their product line. By contrast, this thesis has shown that electrification is perceived as an outside pressure that threatens the existence of traditional automotive companies by targeting their core products and drivetrains.

The automotive companies submit to more minor pro-environmental changes and go even further and implement ideas and innovations that originate outside their R+D departments. Thus, they give up on their unique selling points to meet the demands of society and politics. It has been stated earlier in this chapter that government subsidies give more money to some drivetrains than to others. In the case of electrification, electric engines are the emission-free drive system that is supported most by politicians. Therefore, the three companies especially focus on designing electric engines, even though other drivetrains like combustion engines with synthetic fuels or FCEVs are also emission-free. However, these drivetrains do not receive equal political or monetary support, which forces the companies to discontinue the research in further alternative drivetrains. Therefore, this thesis has found that innovations regarding emission-free drivetrains depend on political support and not on company internal innovation. This could potentially hamper the development of new innovative emission-free drivetrains when companies only allocate internal resources to externally supported drivetrains like electric engines. While employees of Company Carl especially negatively perceived this development, some managers of Company Carl and Company Albert also indicated their doubts regarding the sole focus on electrification as the drivetrain of the future.

This thesis has further established the understanding that political and societal influence provokes Company Albert and Company Carl to adapt their technology and innovations to gain societal approval and subsidies from governing bodies. The evidence in the literature regarding outside influences on internal technology development and innovation shows that outside factors like information from the industry environment have a positive effect on innovation

performance (Frishammar & Åke Hörte, 2005). Furthermore, the literature suggests that unforced pro-environmental actions like the integration of pro-environmental behaviour in companies' structures proves to be beneficial to the inherent innovation capabilities of companies (Broadstock et al., 2020). However, in the case of this thesis, external policies are forced on the companies to integrate innovation regarding emission-free drivetrains. The literature states that externally imposed changes on companies could have a negative impact on their innovative performance by increasing policy uncertainty (Ahsan & Qureshi, 2021). This statement is supported by this thesis since a general distrust regarding the politics' decision-making and the subsequent consistency of these decisions were observed among the managers and employees of Company Carl as well as from the managers of Company Albert. Furthermore, the literature also suggests that the automotive industry currently finds itself in a sandwich position between political influence regarding technology and customer demands, which leads to potential disruptive innovation for automotive companies (Dobbs et al., 2015; Wittmann, 2017). Managers of Company Carl have complained that meeting costumers' demands for SUVs cannot be met while politics require full electrification. Consequently, this means that the traditional automotive industry might lose control over the automobile market if they are not able to compete with newcomers like Tesla who are not caught between two drivetrains but only produce electric mobility (Dobbs et al., 2015; Wittmann, 2017).

5.2.4. Employee-specific negative perceptions of electrification

5.2.4.1 Negative employee-specific perceptions of electrification based on technological flaws

Most employees of Company Carl perceive the current state of electrified drivetrains and technology as inadequate to meet their customers' requirements. Employees of Company Carl criticised that BEVs do not have sufficient ranges to compete with ICEs. Moreover, they questioned whether the electrical grid in Germany could facilitate a fully electrified fleet. The findings of previous literature support these negative perceptions of electric drivetrains (Casper & Sundin, 2020; Tamor et al., 2013).

It is unclear whether the managers of Company Carl thought similarly about the technological potential of electrification but felt restricted to express their critical opinions openly despite the commitment to confidentiality and anonymity governing the interviews. Such caution on the side of managers can be anticipated due to Casper and Sundin's (2020) findings, which state

that managers or even CEOs from other automotive companies mention problems regarding electrification technologies such as the toxic ingredients of batteries. However, no such perceptions were found among managers in this research.

The literature further suggests that electrification as a technological change undergoes a ‘hype-cycle’, which means that automotive companies must raise awareness by publicly communicating the upsides of electrified drivetrains. By doing so, automotive companies want the public and politicians to know that the new innovative technology and drivetrains are viable choices but also that they require additional infrastructure, such as an improved electricity grid, in order to work (Budde et al., 2015). In some areas of Germany, electricity grids cannot facilitate the demands for electricity to power electric vehicles, and not enough charging points are available (BMUV, 2020). This dynamic explains why managers of the three automotive companies do not discuss technological flaws with third parties since their new drivetrains require public and political support for improved infrastructure.

5.2.4.2 Negative employee-specific perceptions of electrification based on reduced workforce

This research also shows that all managers from the three case study sites acknowledged that the automotive industry is at a crucial point in its history, and every management decision could have severe outcomes for employees and the industry. Electrification is predicted to lead to a comprehensive simplification of production mechanisms that will heavily impact traditional automotive companies like Company Albert and Company Carl, which will also have to consider dismissing staff members if complete electrification occurs.

Depending on the speed and degree of electrification that will take place in the companies within the next few years, layoffs and unemployment are probable results. The changes that result from electrification are perceived as inevitable and managers stated that there is no alternative to electrification. Thus, fear and uncertainty will stay, especially with Company Carl’s employees, since they will face immense challenges due to electrification. This in turn explains why Company Carl’s employees are unsatisfied with the situation caused by electrification. The literature provides many examples of the underlying mechanisms of change, namely the perception of losing control and the fear and uncertainty this produces; these mechanisms are also inherent to electrification (Bordia et al., 2004; French, 2001; Herold et al., 2007; Herzig & Jimmieson, 2006). It must be added that some managers at Company Albert

added that they also notice fear and uncertainty among their employees. However, since this specific employee group was not interviewed, it can only be assumed that Company Albert's employees have similar fears to the employees of Company Carl.

According to managers of this study, a radical electrification could potentially lead to the loss of 60% to 80% of employees in the supply chain, a claim supported by the findings of Erich and Witteveen (2017). Casper and Sundin (2020) have shown that it is possible that even up to 86% of automotive companies' staff in the supply chain could lose their jobs. This means that in the case of Company Albert and Company Carl, tens of thousands of people would lose their jobs. Therefore, it is obvious why uncertainty, fear and distrust play a prominent role when considering the change towards electrification and its effects on staff.

5.3 Companies' communicative response to electrification

A strong finding was made by this thesis regarding the communicative response of the three companies when being confronted with electrification. Previous literature has found that companies might apply new linguistic approaches when communicating pro-environmental changes (Ferguson et al., 2016). However, this thesis found that all three case study companies abandoned their usual change communication strategies and approaches when communicating electrification. Moreover, when considering the communication approaches for communicating electrification, all three companies were found to apply a rather abbreviated change communication strategy²³.

5.3.1 Controlling external media communication

First, it shall be noted that Company Albert and Company Carl apply a similar communicative response to electrification. As public companies, both companies are faced with outside attention, which results in media coverage about their transition towards electrification. Thus, their first communication step when facing electrification was found to be the attempt to control external media communication through internal communication.

²³ See differences between companies' conventional change communication processes and their applied communication process when communicating electrification in Appendix A of the Appendices in Table 4 and Table 5

Usually, the extant literature differentiates between two distinct aspects of external communication. External company communication is described as a communication procedure used to communicate new developments externally. Furthermore, external communication can be described as a means to obtain news and information about the corporation through external sources (Desai, 2014; Men & Stacks, 2014; Tushman & Katz, 1980; Zeithaml et al., 1988).

This thesis found that employees especially use external media channels to inform themselves about upcoming changes regarding electrification which exposed them to potentially harmful or wrong information which had to be controlled by the management of Company Albert and Company Carl. While previous research has indicated that external media communication can play a positive role in crisis management and company internal PR (Deverell, 2021; Lin et al., 2016; Macnamara & Zerfass, 2012; Špoljarić, 2021), this thesis identified that external communication regarding electrification creates uncertainties and fears among employees. Therefore, contrasting the above presented literature regarding external media communication and its positive impacts on internal PR, this thesis has found that manager participants at Company Albert and Company Carl perceive external media communication not as a positive influence on their internal PR but rather as an obstacle that has the potential to misinform staff and thus cause resistance. Company Albert and Company Carl thus applied similar strategies to control external communication through personal face-to-face communication (Company Albert) and transparent internal information communication and employee involvement (Company Carl).

Moreover, even managers were found to react to external communication regarding electrification by perceiving the media as a negative driving force impacting internal management decisions and resource allocation. This is in line with the literature, which indicates that managers can adapt strategically to external media coverage by adjusting their leadership actions and resource allocation (Desai, 2014; Haunschild & Beckman, 1998; Ocasio, 1997; Schwab, 2007).

Consequently, the two companies react to the information given by external media communication with internal information communication. This communication measure exclusively focuses on facts about upcoming changes to provide detailed information to refute wrongful external media coverage and tries to limit hasty resource allocations from other

managers. However, employees of Company Carl perceive internal information communication that reacts to public announcements negatively and showed a higher level of distrust regarding this specific communication of their management.

5.3.2 Employee involvement in companies' electrification communication

In addition to controlling external media communication, this thesis has found that the following steps taken by Company Albert's and Company Carl's management to communicate electrification are also similar.

Both companies aim to integrate employees in the change communication process by increasing employee involvement to enhance their acceptance of this change. Similar findings have been identified in the literature, where employee involvement and employee integration in changes are widely discussed (Ali & Anwar, 2021; Brown & Cregan, 2008; Charles et al., 2021; Hussain et al., 2018; Morgan & Zeffane, 2003; Sharif & Scandura, 2014; Sims & Sims, 2002). In this context, it was found that Company Albert's and Company Carl's managers, who both face resistance from their employees, focus even more on employee involvement and perceive this communication approach as a sensemaking component. Therefore, it can be stated that Company Albert and Company Carl may apply similar change communication strategies regarding electrification because they face similar circumstances such as internal employee resistance and outside pressure from the media.

Company Albert and Company Carl, as traditional automotive companies that only manufacture automotive products, attract employees with an affinity and fascination for ICEs, thus making these employees critical of electrification and its communication. Therefore, this thesis found that their involvement in the change process is substantial for their respective management to reduce their resistance.

5.3.3 Project team communication and continuous communication

This thesis found that initial communicative responses to electrification of Company Albert and Company Carl were very similar. Both companies were found to control external media communication to reduce their employees' uncertainties and fears. In the subsequent step, both

companies tried to integrate their employees in the change process to further reduce their resistance and apply a sensemaking component.

By contrast Company Bertha is not a traditional automotive company like Company Albert and Company Carl. Therefore, Company Bertha did not face as much external media communication, and because of their pro-environmental attitudes, employees were also not found to strongly resist electrification. Thus, Company Bertha was found to use a different initial communicative response to electrification. While also abandoning their conventional change communication process, Company Bertha formed a project team to communicate all relevant changes regarding electrification and used a continuous pro-environmental change goal communication process to remind their employees of the current changes constantly.

Previous literature has shown that the integration of designated 'Employee Champions Teams' only had a moderate impact on employees and their overall environmental performance (Hargreaves, 2011). However, Hargreaves (2011) still observed a positive shift towards the companies' reduction in waste and emissions after the integration of the 'Employee Champions Teams'. The findings of this thesis have shown that Company Bertha also integrated designated project teams into their change communication process and tasked them to communicate changes to their co-workers. Building upon Hargreaves' understanding, the employee teams at Company Bertha were not found to directly or independently impact the environmental performance of their organisation, however, the understanding was established that these designated project teams at the very least have a moderate positive impact on the change communication process. They can be understood as a form of integrating employees in the change communication process. Moreover, designated project teams at Company Bertha were found to be composed of managers and employees, which means that employees were also put in charge of communicating changes and were thus actively integrated in the communication process of the ongoing changes. The project team at Company Bertha subsequently follow a strategy of continuously communicating the company's pro-environmental change goals to remind staff of their change venture to become carbon neutral. Previous literature has found that continuous internal communication can increase the success of a change venture (Bratton & Gold, 2017; Klein, 1996; Kotter, 1996; Young & Post, 1994). While managers from Company Carl and Company Albert also stressed that continuous communication is applied at their companies, Company Bertha extended this concept to primarily respond to electrification and pro-environmental goal setting by applying a project team that consists of a diverse body

of representatives from different departments. Therefore, this project team can address more than one department with specific messages.

5.3.4 Abandoning conventional change communication processes

This thesis has found that all three companies change their conventional communication strategies to communicate electrification by applying new channels and communication methods. This is in stark contrast with the usual approaches regarding conventional change communication in this industry, since this thesis has also found that the three German automotive companies usually use strict processes for every business task, including communication processes.

The literature considering change communication supports the understanding that, generally speaking, change communication itself needs to be integrated into business processes and thus has to work as a strategic business planning tool (Barrett, 2002; Kotter, 1996, 2008). The findings of this thesis confirm this perception by showing how the three companies have created a change communication process for conventional changes, the methods of which are familiar to every participant and are often even considered standard business and communication procedures. However, this thesis has found that the applied communicative responses to communicating electrification differed strongly from the companies' normal change communication processes. When facing the challenges of electrification and all its inherent changes, the companies have been found not to rely on the pre-established communication methods, but rather apply new communicative responses to overcome resistance of electrification. These new inventive communication channels allow the companies to react faster to new challenges and demands so that they can break with their change communication processes, which in turn enables them to communicate the changes resulting from electrification faster and more specifically to their employees.

It can consequently be argued that the findings of this thesis show that the companies resemble each other, both in their conventional change communication strategies and in their abandonment of conventional change communication strategies regarding electrification. The participants explained this rapid change of focus with the fact that unforeseen circumstances such as external media communication or employee resistance must be controlled with adequate communication measures. The literature does offer some information about similar radical

shifts in internal communication strategies. Such shifts can be observed when companies are dealing with a radical change or crisis and have to resort to a suitable form of communication that focuses specifically on the unexpected new situation and therefore varies from usual communication techniques and is often ad-hoc communication or communication on demand (Heide & Simonsson, 2014; Jarzabkowski et al., 2019; Mazzei et al., 2012; Ozanne et al., 2020; Stoddard & Jarvenpaa, 1995; Strandberg & Vigsø, 2016; Todd, 1999).

Responsive or ad-hoc communication applied during these change settings is described as differing from 'normal' internal communication and is thus sometimes considered ad-hoc as it does not follow the usual processes and procedures. Some previous studies that considered radical change and its management see a very similar development in the events that take place in the automotive industry (Todd, 1999). Todd argues that a radical change challenges a company and especially its managers to adopt new unknown behaviours in a short period of time while also considering day-to-day business. In view of the time pressure and the required response to a market window, normal communication is often difficult to realise, so business processes must be redesigned. The first communicative ad-hoc response of the three companies is therefore similar to the findings in the literature (Jarzabkowski et al., 2019; Mazzei et al., 2012; Stoddard & Jarvenpaa, 1995; Todd, 1999). Moreover, the literature on crisis management identifies practices where additionally to ad-hoc communication, improvised content is applied, which naturally cannot comply with pre-defined communication strategies (Heide & Simonsson, 2014; Ozanne et al., 2020).

5.3.5 Electrification-specific communication methods

This thesis found that all three companies abandon their conventional change communication process and thus applied different communicative responses to electrification. A further understanding was established that all companies designed specific communication methods to further facilitate the change of electrification in their companies. Company Albert designed a communication method that was called tactile communication, Company Bertha developed a communication method that aims to create pro-environmental automatisms for their recipients, and Company Carl uses pro-environmental goal setting that is communicated by using conventional waterfall communication.

5.3.5.1 Tactile communication

After the initial communicative response to electrification, Company Albert applied a new communication method that aims to make the changes of electrification striking for the recipients and thus create a sense of urgency for them. The term ‘tactile’ communication is implemented in this thesis because the communication strategy uses real cars and real products manufactured by Company Albert, which are visually and physically presented to the recipients.

By applying tactile communication, the management aims to create a sense of urgency among the employees. All recipients at Company Albert have gone through extensive product training at the beginning of their career. In this training, employees learned everything about Company Albert’s products, and about the products with which they will work daily. This thesis has found that this extensive and physical product training has two objectives: firstly, for employees to identify with their products and understand that every component is needed to make the car move on the street; and secondly, after learning about Company Albert’s products in this training, for employees to take pride in what they do. This research uses the term ‘tactile’ communication based on this training, because Company Albert allows its employees to learn about the products with all their senses, hoping that the recipients will create a bond between them and their products. This tactile communication method aims to create a sense of urgency among the employees, who see the products, with which they have identified before, taken out of the conventional car, one by one, and who will therefore understand that their own jobs will become redundant if no solution is found. This communication method will ultimately show the recipients that Company Albert will go out of business unless the new challenges and requirements of electrification are fulfilled.

Senior executives of Company Albert explained that only with striking examples that physically show the recipients how electrification will impact the products will employees see and understand the urgent need to change and therefore potentially accept the consequence that fewer people will be needed in the workforce in the near future. Moreover, striking, and tangible examples like missing products in a real-life car have been found to create a pressing theme for recipients, who ultimately might stop resisting or questioning electrification because they see the adverse and inevitable effects of electrification on automotive supplier companies like Company Albert.

A communication method like Company Albert's tactile communication was not found in the change literature. When considering the structure and purpose of tactile communication, it becomes obvious that Company Albert's managers want to create a sense of urgency among their employees regarding electrification by making a striking example of how electrification will impact Company Albert's products. This sense of urgency, however, is often discussed in the change management literature, stating that urgency has to be created around a change in order for recipients to understand why they have to change and why it is important to change now (Barrow & Toney-Butler, 2017; Galli, 2018; Graetz, 2000; Kotter, 1996, 2008). Thus, even though creating a sense of urgency is known to the literature, creating such urgency through tactile communication is a new finding of this thesis.

To understand what mechanisms lie behind tactile communication and what the effects of this communication channel are on its recipients, literature other than the change literature must be considered. Tactile communication tries to convey messages by using visual demonstrations of products the recipients have bonded with. Considering the embodiment literature and, in particular, the literature addressing the embodiment of learning and the cognition of learning, it becomes evident that human learning and understanding is based on observations within linguistic and physical systems of which people are a part of (Brocklesby & Mingers, 2005; Horn & Wilburn, 2005; Maturana & Varela, 1987; Rosch et al., 1991). Following this logic, learning something new for the employee recipients of Company Albert is based on their observations of physical and linguistic channels that are offered by their company. Therefore, tactile communication, which offers a physical and linguistic component, appeals to the learning process of the recipients for them to understand the new changes that are provoked by electrification through an experience which leads to embodied learning and understanding. However, when considering how tactile communication is applied at Company Albert, it becomes clear that this communication channel is intended not as a learning event but rather as a communication event that aims to convey a striking message to the employees.

When considering tactile communication from its communication side and seeing that the channel is used to convey messages that are structured in a way that employees can relate to, tactile communication can be considered as an experience. Also, the literature on experience economy for instance states that an experience can provide a meaningful learning component to the recipient if the recipient perceives the communication as personally relevant and if the conveyed information is memorable and perceived as content that provokes feelings of

sensation and experience (Pine & Gilmore, 1998a, 1998b; Poulsson & Kale, 2004; Yeoman & McMahon-Beattie, 2019). Therefore, tactile communication as a communication method can be understood as an event or an experience with a learning character that appeals to its recipients on a personal level.

As the term tactile communication indicates, this communication method appeals to the senses of the recipients in order for them to establish a connection between the products' future and their own future. Appealing to the senses of recipients is not a concept that is found within the change literature, but a concept that is discussed in anthropology and ethnological studies, where previous research identified the power of sensory perceptions of one's environment that can shape an understanding and feeling of reality (Lee et al., 2013; Pink, 2007, 2008, 2020; Vannini et al., 2013). Furthermore, sensory knowledge is obtained when experiencing new realities with senses other than standard communication components like noises or speech. This ultimately allows the recipient of sensory knowledge, which in the case of tactile communication can be understood as embodied imaginative knowledge, to obtain an understanding of the given surroundings with all senses (Vannini et al., 2013). This access to knowledge and understanding that is given to recipients through tactile communication, where a multi-sensory communication approach is applied, allows both the communicator and the recipient to experience the surroundings and communication object from a different perspective and therefore deepen the bond between product, reality and recipient (Allen-Collinson & Leledaki, 2015; Howes & Classen, 2013; Orr et al., 2016; Vannini et al., 2013). Tactile communication appeals to more senses than regular change communication and thus provides a multi-layered sensory communication approach to the recipients. Tactile communication appeals to Company Albert's employees' by including all their senses and therefore creates a relatable reality that can be understood by everyone independent of one's educational background and position in the company. Finally, according to the literature, this communication channel also creates a team identity based on the senses of the recipients (Lee et al., 2013). Despite tactile communication being a useful method to communicate the urgency of electrification to the employees, no indication for an enhanced team identity was observed at Company Albert.

Company Albert's staff is predominantly focused on the technology and innovation of combustion engines, and thus all managers and employees have a connection to their company's products. Considering tactile communication as a channel that appeals to

employees' affinity with technology, it can be stated that a link between the communication content and the recipient can be established, and therefore an enhanced understanding of electrification takes place. Similar dynamics can be found in the literature, where it is stated that the connections between employees and technology in professional environments are directly linked together and have the potential to shape a dynamic of power, knowledge and motivation (Orlikowski, 2000). Considering tactile communication where Company Albert's technology is at the centre of the communication, it is evident that the recipients will be able to connect more easily to the communication content and thus relate their own situation to the technology and parts in the cars. This is especially important when considering the fact that innovative power comes from the employees who shape innovation with their ideas and are thus connected to all products of their company (Kremer et al., 2019).

Tactile communication is a communication method which is not mentioned in conventional change literature, and the literature cited above cannot be found in change-specific research. This thesis has made an attempt to put the findings regarding tactile communication in a context that can explain the underlying mechanisms of this communication method. Since tactile communication is not found in the conventional change literature, other research fields had to be considered by this thesis to explain the underlying dynamics that make this channel a suitable communication approach during change processes. To conclude this section, it can be said that the method of appealing to recipients' senses has been found to be effective since a learning process can be improved by addressing the recipients' senses. Moreover, its event character and the incorporation of company products allow to access the recipients easily and thus, create a striking message.

5.3.5.2 Creating pro-environmental automatisms

Company Bertha's initial communicative response to electrification applies a project team and continuous goal communication. However, to achieve complete carbon neutrality within the next 20 years, Company Bertha's managers proposed that more communication measures are necessary. Therefore, Company Bertha's management proposed further communicating pro-environmental behaviour to their employees by demonstrating pro-environmental actions. This communication channel aims to create automatisms among the employees, thus positively influencing their behaviour and encouraging them to act more sustainably. Pro-environmental

automatisms can be understood as sustainable actions that Company Bertha's managers constantly exemplify.

When it comes to the communication of automatisms that aim to increase sustainability, managers need to be the central figures. To achieve a change in employee behaviour, the managers' actions, and behaviour must change, so that they also act sustainably and pro-environmentally at their workplaces. This will ultimately allow the employees to see how pro-environmental behaviour and pro-environmental automatisms will help the whole company.

The literature on change management has established that in times of change managers should always lead by example and be aware that their behaviour is an indicator for employees of how important and how serious a change is (Ford & Ford, 1995; Kotter, 1996). Company Bertha applies the communication of pro-environmental automatisms in addition to pro-environmental goal setting. The management of Company Bertha hopes that the combination of the two communication methods increases the overall environmental performance of Company Bertha. The literature generally supports the understanding that leadership and leaders' behaviour can enhance pro-environmental actions when presented authentically (Bamberg & Möser, 2007; Hargreaves, 2011; Robertson & Carleton, 2018). Therefore, the creation of pro-environmental automatisms has to be established through continuous and authentic exemplary behaviour of Company Bertha's managers. Furthermore, the findings of this thesis are in line with the literature, which states that authority figures encouraging their recipients' to take action on their own by presenting and representing the right pro-environmental behaviour will ultimately lead the recipients to be more motivated to engage in pro-environmental behaviour on their own (Gifford & Nilsson, 2014; Osbaldiston & Sheldon, 2003; Robertson & Carleton, 2018).

In contrast to Company Albert's approach, where tactile communication is used to create urgency, creating automatisms constitutes Company Bertha's approach to enhance its employees' pro-environmental behaviour and understanding of the upcoming changes that will result from electrification. As the literature in the section above shows, involving managers as role models is an approach that has been proven to work before in other contexts and in other organisations. Especially at Company Bertha, managers have to be role models because their employees expect their employer to be as environmentally friendly as they are, so creating automatisms for employees in order for them to enhance their pro-environmental behaviour is

an approach that could increase motivation and identification of employees towards new pro-environmental projects of Company Bertha.

5.3.5.3 Pro-environmental goal setting

While this research has found that Company Albert and Company Bertha designed their own unique communication approach to communicate electrification (tactile communication, creation of automatisms), one further concept has been identified regarding the communication of electrification that is used in two of the three companies, namely pro-environmental goal setting. Company Bertha and Company Carl use this communication approach to increase the change recipients' acceptance and motivate them for upcoming pro-environmental changes.

All three companies use goal setting to track performance and motivate employees, however, this thesis has found that pro-environmental goal setting is a communicative method focusing on numeric measurement of pro-environmental performance and was exclusively introduced in response to the demanding challenges of electrification. It became evident that the management at Company Bertha and Company Carl use pro-environmental goal setting during the transition towards electrification to be transparent and to motivate their employees. Unlike Company Bertha and Company Carl, Company Albert does not use pro-environmental goal setting. This can be explained by the fact that Company Bertha and Company Carl as larger companies are subject to European ecological reports, and therefore must measure their overall emissions of CO₂ to provide annual ecological and sustainability records. Company Albert as a public company is also subject to environmental reports, but due to increasing demands for ecological performance of larger companies, Company Bertha and Company Carl have both set themselves the goal of becoming carbon-neutral organisations to avoid fines or other consequences imposed on them by either the EU or the federal government.

The literature only offers a few sources regarding pro-environmental goal setting, which is comparable to the defined goals by Company Carl and Company Bertha (Baard & Björnberg, 2015; Staples et al., 2017; Staples et al., 2020). These studies have found that pro-environmental goal setting as a communication strategy is applied to enhance acceptance for pro-environmental concepts and that pro-environmental goal setting is directly linked to better pro-environmental performance. Furthermore, pro-environmental goal setting is considered a motivational factor that has the potential to accommodate and improve pro-environmental actions (Abrahamse et al., 2007; Gifford & Nilsson, 2014; Rabinovich et al., 2009; Staples et

al., 2020; Steg et al., 2014). Previous research has also found that pro-environmental goal setting works as a motivation for employees when used as a stand-alone communication approach. This means that, theoretically, only applying pro-environmental goal setting as a communication practice will be enough to motivate employees to act pro-environmentally (Gifford & Nilsson, 2014; Lindenberg & Steg, 2007). This is partially comparable to the finding of this thesis that Company Bertha's employees feel motivated to support their company's pro-environmental change goals. However, Lindenberg and Steg (2020) added to their findings that pro-environmental goals on their own rarely work and that, instead, a combination of multiple personal goals and company goals should be applied in addition to the proposed pro-environmental change goals to have a motivating effect on the recipients. The companies, however, mainly focused on only using pro-environmental goals, and a broader context was not presented to the employees.

5.3.5.4 Waterfall communication

Company Carl did not create specific communication channels to communicate electrification like Company Albert, which applied tactile communication, or Company Bertha, which emphasised the creation of pro-environmental automatisms. However, Company Carl introduced pro-environmental goal setting as a new communication method to facilitate the change of becoming carbon neutral within the next 20 years. While Company Bertha uses the creation of automatisms to facilitate and communicate their pro-environmental goals to their employees, Company Carl uses its pre-established internal communication methods to communicate pro-environmental change goals to their employees.

The management of Company Carl perceives the equal distribution of information throughout the organisation as essential and thus applies top-down cascade communication. In this communication method, Company Carl decentralises information and every line manager is responsible for the communication of information to his or her department. This method shall ultimately ensure that all staff receive the same message, including manual workers who have neither company computers nor company email addresses.

Using waterfall communication allows Company Carl to transport a large amount of information internally and to reach all employees without relying on digital communication. When considering the literature in the context of change-specific top-down communication, it

can be seen that previous studies attribute much potential to this communication when it comes to the information content of this communication (Baker, 2007; Bel et al., 2018; DiFonzo & Bordia, 1998; Klein, 1996; Kotter, 2008). Compared to the other two companies, Company Carl has a high percentage of manual workers, which ultimately explains this top-down information communication approach.

5.4 Participants' perceptions of electrification-specific communication methods

This thesis also aimed to identify the perception of electrification as a change and has thus found that managers and employees sometimes share specific negative or positive perceptions of electrification as a change, such as electrification as an outside pressure or electrification as a change that has a positive impact on the environment. Unlike the perceptions of electrification as a change, this study has found that manager and employee participants have very clear and distinct perceptions of the new communication methods applied to communicate electrification. Therefore, no similarities in the perceptions of the new communication channels have been found between the two groups. The following sections shall provide a discussion based on this thesis' findings regarding the three companies' manager and employee perceptions of the new communication methods used to communicate electrification in the different companies.

5.4.1 Managers' perceptions of electrification-specific communication methods

During the interviews, managers of Company Carl did not want to discuss their personal perceptions of the communication of electrification in detail since they wanted to represent a coherent line regarding the companies' strategic goals. Two managers at Company Bertha and two at Company Albert reported that they perceive the current communication of electrification and its pro-environmental changes as insufficient if the organisation wants to reach all employees.

The communication of electrification and the connected pro-environmental changes had only started at the three companies shortly before the research for this thesis began. Nonetheless, this study has found that it is difficult for managers to assess the success or failure of their communication strategies since this change is very new and the effects of their change

communication are hard to measure. Considering these reasons, managers might not have been able to express their perceptions regarding the communication of electrification, and instead adjusted their scarce statements to be in line with the companies' strategies. It was difficult to assess whether these managers supported the new ways of communicating electrification or if they had little to no influence on the communication strategies, even though their positions would have allowed them to shape and influence their respective companies' communication strategies. While this thesis considers the participants' perceptions of electrification as a change and the communication of electrification separately, participants sometimes jumped between the two concepts.

In this regard, the literature provides evidence that those leaders who are not willing to support a change, or who even resist it, exert a negative impact on their employees' own support of the change and might even provoke their employees to resist the change (Koning & Van Kleef, 2015; Oreg & Berson, 2011; Stewart & Barrick, 2004). In particular, managers at Company Carl and some managers at Company Albert did not want to fully express their personal perceptions of electrification. As shown by the literature presented above, it becomes apparent that managers who openly question a change might provoke resistance among their employees, which managers at all levels try to avoid. This thesis does not suggest that critical thinking or questioning changes is a negative leadership attribute; however, when considering electrification as a change that is hard to avoid for companies, managers need to show courage in order to set a good example for their staff and therefore act consistently with their companies' strategies (Furnham, 2002; Kotter, 1996).

5.4.1.1 Managers' perceptions of the communication of electrification as an external communication strategy

When assessing the communication of electrification, managers at Company Albert and Company Carl predominantly consider the internal communication of electrification as a way to also gain public attention and present their companies in an environmentally friendly way. This allows the respective managements to appeal to younger people who are motivated to apply to and consequently work for companies that focus on solving environmental issues.

In the specific case of Company Albert, internal communication of electrification is regarded as a recruitment strategy that has the potential to make Company Albert more appealing to

young people as an employer, since the public knows about Company Albert's efforts to meet European and federal demands to decrease pollutants like CO₂. Company Carl uses the same strategy, but, as an OEM, Company Carl is more appealing as an employer to young professionals and graduates. When considering the communication strategy that aims to include stakeholder perspectives in internal communication, it becomes clear that Company Albert's and Company Carl's internal change communication approach aims to address external and internal stakeholders alike, in order to be appealing as a green company to as many recipients as possible (Welch, 2012; Welch & Jackson, 2007).

This thesis has also found that the managements of Company Albert and Company Carl perceive the internal communication of electrification, and its resulting pro-environmental changes, as a means for the two companies to increase their sustainability figures, which have to be reported to the public in sustainability reports. In this regard, it has been found that managers are aware of how vital companies' environmentally friendly actions are for young professionals and graduates. Especially the employment structure of Company Bertha as a green company shows how positively young professionals and graduates perceive their companies' pro-environmental actions. Thus, this thesis found that change communication at Company Albert and Company Carl also aims to appeal to the public by offering detailed press reports about their internal changes and their communication regarding electrification.

5.4.1.2 Managers' perception of the diversification of electrification-specific communication methods

Some senior managers at Company Albert and Company Carl perceived the current change communication regarding electrification as incapable of reaching all their employees equally. They stated that some employees in production, who have a lower level of education, might not be accessible via the current communication measures, since they are regarded as a different group with a different focus compared to employees in office jobs.

This statement was not intended to be condescending in any regard. Rather, this thesis has found that these managers support the idea of a diverse body of employees with different focuses, in which different topics play bigger roles for some employees than for others. This results in a communication of electrification that must be diverse and consequently needs to be tailored specifically to different employee groups. This finding is in line with the literature, where

previous research has stated that tailored communication has the potential to improve employee support for changes and to enhance employees' commitment to proposed changes (Barrett, 2002; Husain, 2013; Johansson & Heide, 2008). However, while tailored communication might be more effective for communicating with manual workers, the three companies, and especially Company Albert and Company Carl, are limited when communicating with manual workers, since manual workers do not have access to company computers, company emails or company social intranet. While the managers perceive that more diverse communication would be beneficial to communicate electrification, the manual workers at Company Albert and Company Carl only receive change communication from their line managers.

5.4.2 Employees' perceptions of electrification-specific communication methods

This current section will consider employees' perceptions of the communication applied by the management to specifically communicate electrification and its pro-environmental changes. The manager groups of all three companies shared similar perceptions towards their applied electrification-specific communication. By contrast, employees were found to have both shared perceptions across the three case study sites and perceptions that were exclusive to one company and its employee group. This current section will outline the shared employee perceptions of the applied electrification communication methods and Section 5.4.3 will present employee perceptions that were exclusively found in each company.

5.4.2.1 Paradoxical perception of external media communication regarding electrification

As discussed earlier in this chapter, many participants have been found to perceive electrification as external pressure imposed on their companies by politics and society. This section will thus focus on the perception of external communication of electrification, which primarily happens through outside media channels that are not linked to the companies.

This thesis has found that external media communication regarding electrification often contains information about upcoming or ongoing internal changes at the three companies. Company Carl and Company Albert as public companies are also obliged to communicate some internal changes and developments publicly even before internal communication to provide transparency to shareholders and the stock market. Managers of Company Albert and Company Carl however, reported on their activities to control external media communication to minimise

the spread of wrong information in their companies and thus reduce fear and uncertainties among their employees. What is paradoxical regarding external media communication is the fact that employees of Company Carl perceive information that is conveyed publicly and over external communication channels as more substantial and detailed than internal change communication regarding electrification. Some employees even reported placing greater trust in electrification-specific information conveyed by external channels, since internal communication can be perceived as vague or containing insufficient information. Employees at Company Carl have further paradoxical perceptions of electrification as a change; although electrification is perceived as a negative outside pressure, its external communication is perceived as a welcome source of information. Therefore, it is necessary to differentiate between electrification as an externally imposed change and its subsequent external communication. While externally imposed changes have been found to be perceived negatively by the employee group, its subsequent external communication is perceived more positively, because employees perceive external media communication regarding electrification as richer in information than internal company communication. Therefore, these positive perceptions can be referred to the employees' need to gain as much information as possible about upcoming changes. A second paradox becomes apparent when comparing the finding to the literature where it was established that during times of change, employees would typically rather receive information from their managers or superiors than from external channels (Allen et al., 2007; Hargie & Tourish, 2009; Larkin & Larkin, 1994). Thus, combining the understanding of the literature and this thesis' findings, it can be concluded that employees prefer the communication channel that offers the most information regardless of whether these communication channels are internal or external.

This thesis has found that media communication regarding electrification constitutes a problem targeting the relation between employees and managers, since employees often receive external media communication about new developments before this information is communicated internally, which makes employees question their managers' trust in them. Public companies are obligated to communicate new developments externally in order to provide transparency for the stock trade. However, when considering the information that is publicly conveyed by the companies themselves, it has been found that automotive companies would rather report positive developments publicly, such as increasing sales or beating sales records. However, at the same time, these companies communicate internally about electrification and its effects resulting in money problems, layoffs, and cutbacks. Under these circumstances, where

companies' external media communication contradicts internal developments regarding electrification, this thesis has found that uncertainty and frustration are provoked among the employees of Company Carl.

In contrast to Company Carl's employees, the employees of Company Bertha are not as much affected by external media communication. However, some employees of Company Bertha still reported experiencing external media communication regarding electrification and thus feeling that there is a lack of consistency between internal and external communication since Company Bertha's management has been found to have not substantially communicated electrification internally at the time this thesis' interviews were held. While Company Albert's and Company Carl's initial response to electrification was to control external communication through internal information communication, Company Bertha's initial response to electrification was creating a project team that oversees the communication of electrification related changes. This explains why some employees of Company Bertha perceived a lack of consistency between internal and external communication regarding electrification since a specific response to external communication was not designed by Company Bertha's management.

When considering the literature, it becomes clear that employees are mostly invested in their companies and want to learn about current changes by obtaining as much information as possible (DiFonzo & Bordia, 1998; Kitchen & Daly, 2002). However, this thesis' findings show that differing employee perceptions of external information communication and internal change communication can cause uncertainty and frustration. This finding is similar to the understanding of previous research which found that uncertainty is likely to emerge through different communication channels and information sources. Consequently, recipients of communication can develop a trusting or a distrusting relationship with certain communication channels and information sources, depending on their content consistency (Bordia et al., 2004; Brashers, 2007).

This thesis has shown that the general perception of a change and the perception of its communication are two different entities. This means that change supporters can still negatively perceive the respective change communication. Although Company Bertha's employees negatively perceive certain external change communication, they still support electrification as a change. By contrast, Company Carl's employees, who have been found to perceive external

media communication positively, still have negative perceptions of electrification as a change initiative.

5.4.2.2 Negative employee perceptions of pro-environmental goal communication

The managements of Company Bertha and Company Carl both reported having the goal to become carbon-neutral within the next 20 years. One manager at Company Carl even stated that the whole fleet of Company Carl is set to be emission-free by the year 2050. These goals are ambitious, but this thesis has found that employees at Company Carl question these goals and consider them unreasonable or unachievable and therefore feel pressured by this type of change communication. This thesis supports the understanding of previous research, which states that pro-environmental goal communication is a difficult task for any communicator since a substantial amount of uncertainty and misinformation regarding environmental issues is currently present among recipients, leading to scepticism and the rejection of climate change initiatives (Shaw et al., 2016).

Company Carl's employees expressed their distrust concerning the communication of carbon neutrality and stated that they perceive the communicated goals to have inherent randomness. However, as the companies' managers explained, this goal has been partially set by outside forces, especially the European Union and the federal government, who require companies to become carbon-neutral within the next 20 years. The employees of Company Carl especially considered the 20-year goal timespan as insufficient to reach the communicated goals, since employees at Company Carl measure time in car generations. Employees at Company Carl connect the carbon-neutral deadline with the release time of only two to three car generations and thus regard this specific communication as applying immense pressure to change the drivetrain of a whole fleet within this short period. Company Carl's employees' perceptions can be supported by the literature which states that recipients of pro-environmental goals might take a defensive stance and justify their actions and short term needs by claiming that the current system is working, and new goals are unnecessary (Feygina et al., 2010). Contrary to the belief of the companies' managers that the communication of pro-environmental goals should have a motivational impact on employees, the employees feel under pressure and thus perceive pro-environmental goals as sources of additional stress. The lack of intermediate goals intensifies this feeling of stress and uncertainty caused by the limited time available for the overall change, breaking down the massive change into multiple achievable goals. Even though Company

Carl's managers specifically expressed that short-term goals for becoming a carbon neutral organisation were defined, employees of Company Carl did not know about them, which shows an apparent lack of transparent communication regarding goals in Company Carl.

Company Carl's and Company Bertha's employees also reported perceiving uncertainty caused by missing defined milestones that would show them how carbon neutrality will be achieved. Company Bertha's employees reported that the communication of internal goals usually requires a 'break plan' with 'sprint phases', in which intermediate steps are closely described. However, in the case of carbon neutrality, employees of Company Bertha did not report that such a break plan or such sprint phases were communicated or applied at the beginning of this change communication, which again has led to uncertainty in this organisation. Thus, the findings of this thesis contradict the findings of the literature, which requires the proposed goals of carbon neutrality to be SMART goals in order to be accepted by the employee group (Specific, Measurable, Attainable, Relevant, Time-Bound) (Cothran & Wysocki, 2005; Lawlor, 2012; Sull & Sull, 2018). However, the findings of this thesis support previous research, which states that participant engagement in achieving pro-environmental goals is often low (Shaw et al., 2018). Similar to the established understanding that the public often lacks fundamental trust and develops uncertainties when decision-makers require substantial lifestyle changes, this thesis also found that employees of Company Carl and Company Bertha develop distrust and uncertainties regarding pro-environmental changes. (Shaw et al., 2018; Steentjes et al., 2017).

Previous studies have also indicated that goal acceptance is directly dependent on the employees' satisfaction with their work environment and, in particular, their team environment (Goffnett, 2020). The findings regarding the rejection of carbon neutrality contradict this statement since no employees were found to dislike their team environment. Moreover, some previous studies have found that a highly set goal like carbon neutrality is directly linked to high employee motivation and increased willpower in employees (Ismail, 2017; Locke & Latham, 2006). By contrast, this thesis has found that the ambitious pro-environmental goals which address the companies' overall ecological performances are assessed more critically by employees and are often questioned. This can be explained with the perceived loss of control and uncertainties that are linked to electrification or other radical changes.

Similar studies have established that pro-environmental goal setting is usually directly linked to an improved ecological performance of the recipients (Baard & Björnberg, 2015; Staples et

al., 2017; Staples et al., 2020). On the contrary, this thesis has found that the pro-environmental goals of Company Carl, which aim to make the company carbon-neutral within the next 20 years, are rejected by the recipients. While employees of Company Bertha generally perceived pro-environmental goals as motivating, supporting the literature, they struggled with the managements' communication lacks essential information and details of how these goals are to be attained.

5.4.3 Company-specific employee perceptions regarding electrification-specific communication methods

Unlike the previous section, where a discussion of shared employee perceptions was presented, this current section will consider the findings regarding employee perceptions that were exclusively found at one company and will thus highlight how the respective employee groups perceive change communication regarding electrification and its pro-environmental changes differently.

5.4.3.1 Company Bertha: Employee perceptions of electrification-specific communication methods

This thesis has established that Company Bertha's employees support electrification as well as other pro-environmental changes. However, it has also been found that they do not necessarily support their management's communication regarding electrification. In particular, Company Bertha deviates from a well-known change management approach familiar to employees, by applying new communication methods.

By introducing new communication methods, Company Bertha abandoned its usual communication processes for communicating conventional changes. This constitutes a change in itself for the recipients of change communication. Therefore, this research has found that Company Bertha's employees perceive the new change communication negatively, although it aims to create pro-environmental automatisms for its recipients. Moreover, employees of Company Bertha are concerned about the change in communication strategy. During the interviews, employees proposed that Company Bertha should take a more structured approach to communicate electrification by integrating a project team. Thus, employees expect that all business areas and business units should stick to existing communication processes that are

familiar to all staff. While Company Bertha's managers integrated a project team as a communicative response to specifically communicate pro-environmental goal setting, no employees were aware of the existence of this project team at the time the interviews took place. This is an indicator of poor communication at Company Bertha, followed by the immediate employee response to distrusting their management. Consequently, employees perceived this as a disruptive event in the communication of electrification at Company Bertha and provoked distrust and scepticism among them. This finding is supported by existing literature which states that a change of communication channels and techniques to which employees have become accustomed can have adverse effects on employees (Heide & Simonsson, 2014; Jarzabkowski et al., 2019; Mazzei et al., 2012; Ozanne et al., 2020; Stoddard & Jarvenpaa, 1995; Strandberg & Vigsø, 2016; Todd, 1999).

The perception of a missing project team at Company Bertha was enough to create distrust and uncertainties. Similar dynamics have been found in the literature when it comes to employees' distrust towards new communication approaches, especially when new communication approaches are conveyed over new channels (Nienaber et al., 2021). Furthermore, other research has found that only communication approaches that are trusted by the employees have the potential to build an internal sense of commitment and trust towards the management's decision making and communication practices (De Ridder, 2004; Elving, 2005; Scholz & Scholz, 2018). Following the above-mentioned understanding derived from the literature regarding the application of new internal change communication channels, it can be concluded that employees' distrust towards new communication techniques is often linked to a 'climate of uncertainty' that results from the application of new communication channels.

While Company Bertha already has a wide range of electrified products, the internal change communication mainly focuses on other pro-environmental aspects like water and electricity saving or waste avoidance. While the literature on change communication often distinguishes between formal and informal communication channels during changes (Johnson et al., 1994; Mohr & Sohi, 1995), this thesis has found that employees are not interested in the formality of the communication channel but rather focus on how familiar they are with the persons who communicate changes to them. Moreover, familiarity with communication practices with which conventional changes have previously been communicated plays an important role for employees. This is in line with the literature that states that in communication settings, in addition to formality, familiarity with the communicators and the channels plays a significant

role when it comes to accepting communication content (Adams et al., 2005; George et al., 2013; Lipiäinen et al., 2014; Sanina et al., 2017).

5.4.3.2 Company Carl: Employee perceptions of electrification-specific communication methods

It has been established by this thesis' findings that Company Carl's employees are rather sceptical towards many aspects of electrification as a change. Technological flaws in electrified drivetrains and in the existing charging infrastructure are perceived as problematic by Company Carl's employees. Additionally, to the pre-existing negative perceptions of electrification, two communication issues provoked even more distrust among the employees, inconsistency of change communication and vague change communication.

Most employees of Company Carl distrusted their management's electrification-specific communication since they perceived that the behaviour of their managers is inconsistent concerning their communicated pro-environmental change goals. When Company Carl's employees perceive an inconsistency between the communication of electrification and their managers' 'non-environmental' behaviour, they question the seriousness of the announced changes and goals. In some cases, this even leads employees to question the urgency of electrification and pro-environmental changes. This thesis has identified examples of such management behaviour, such as managers frequently taking work-related domestic and overseas flights. Employees consider domestic flights with a total flight time of 20 minutes a behavioural inconsistency which does not comply with the company goal of becoming carbon-neutral within the next 20 years. Even managers raise concerns that company racing teams' participation in various racing series harms employees' perception of carbon neutrality. Consequently, the employee group at Company Carl has been found to harbour a distrust towards some internal pro-environmental goals and their respective communication since they perceive their managers as superiors who do not take these changes and goals seriously.

The literature regarding leaders' communication and behavioural inconsistency during times of change shows that recipients can develop a certain distrust towards internal pro-environmental changes when their managers demonstrate non-environmentally friendly behaviour after communicating pro-environmental changes (Ayub et al., 2014; Ford & Ford, 1995; Ford et al., 2008; Kotter, 1996). Further literature on leadership behaviour and the respective acceptance of pro-environmental changes has shown that leaders must embrace their exemplary role

(Bamberg & Möser, 2007; Gifford & Nilsson, 2014; Hargreaves, 2011; Osbaldiston & Sheldon, 2003). Company Carl's managers, however, have shown that due to their acting in a non-environmentally friendly manner, their employees have developed scepticism and distrust in their ability to successfully lead changes like electrification (Robertson & Carleton, 2018; Smollan, 2013).

Another source of employee distrust at Company Carl was identified when employees complained about not getting detailed insights regarding the effects of electrification and pro-environmental changes on Company Carl's staff structure and future employment possibilities. Company Carl's management did not provide a precise number of employees who would have to be made redundant after the implementation of the first measures of electrification. Resulting from the vagueness of this significant communication content, employees at Company Carl have been found to be uneasy, which has generated uncertainty and distrust towards their management.

As the findings of this thesis have established, electrification will have a noticeable impact on the automotive industry's workforce, since the changes resulting from electrification will shrink the industry's current supply chain significantly (Casper & Sundin, 2020). This research has thus established that employees in general require a high level of information regarding changes, especially when it comes to job security and internal restructuring of departments and production processes (Allen et al., 2007; Bel et al., 2018; Daft & Lengel, 1986; DiFonzo & Bordia, 1998; Jimmieson et al., 2004; Kitchen & Daly, 2002; White et al., 2010).

However, one shared information caused significant uncertainties among the employee group at Company Carl. To save money and cope with electrification challenges, Company Carl has announced that between 1,000 and 2,000 manager jobs will have to be made redundant. Moreover, some departments will have to merge to cope with the situation, making some management positions redundant. Interestingly, no announcement was made that employees will have to be laid off in the future. This vague communication about layoffs and department mergers increased distrust among Company Carl's employees. Furthermore, rumours about hidden agendas and management's disputed honesty aggravate this distrust further.

The literature provides clear examples of sources of uncertainty during changes, especially when layoffs and department mergers are part of the change, indicating that employees might

lose control over their personal situation (Bordia et al., 2004; French, 2001; Herold et al., 2007; Herzig & Jimmieson, 2006). In this context, this thesis has found that even the mere announcement of possible layoffs, downsizing and restructuring has a negative impact on employees and on change ventures themselves, since vague announcements have been found to create job insecurity among employees (Abildgaard et al., 2018; Sverke & Hellgren, 2002; Sverke et al., 2008). Therefore, it can be concluded that Company Carl's vague communication of possible layoffs and restructuring is an additional factor that leads to employee distrust of internal change communication regarding electrification.

6. Chapter Six: Conclusion

6.1 Summary of findings and response to research questions

6.1.1 Perceptions of electrification as a pro-environmental change

In answer to the first research question, it can be said that the participants of this thesis were found to have many varying perceptions of electrification, ranging from perceiving electrification as an elemental threat to the automotive industry, at one end of the spectrum, to a necessary step at the other. In general, it can be concluded that the perception of electrification is strongly dependent on a greater number of factors, of which the participant's profession, hierarchical position, company culture and personal attitudes are the most influential ones.

6.1.1.1 Company differences in perceptions regarding electrification

In response to the proposed question of how and to what extent the perception of electrification differs between the three case study companies, this thesis found that there are notable differences. Especially company culture, company size and the companies' business model were identified as influential factors on the sometimes-conflicting perception of electrification.

Out of the three considered companies, Company Bertha was found to be the most in favour of electrification. All participants at Company Bertha perceived electrification as a generally positive and necessary change that has the potential to make mobility cleaner and thus mitigate

the negative environmental impact of the automotive industry. The identified reasons for this positive perception of electrification were, among others, that Company Bertha is a conglomerate and therefore, possesses a very diversified product range of which only a small percentage is directly threatened by electrification. As a result, a successful transformation towards electrification is important for the company, yet Company Bertha is less dependent on conventional ICE components than other automotive companies with a less diversified product range. Electrification is thus perceived as a chance for improvement rather than a threat. This perception is further encouraged by Company Bertha's company culture. Through Company Bertha's culture and mission, managers and employees feel morally obliged to provide advanced technologies that can improve quality of life and thus also help the environment by significantly decreasing emissions. Through their strong corporate culture and emphasis on pro-environmental technologies, most participants from Company Bertha were consequently highly invested in ecological matters and even looked for ways to integrate pro-environmental measures into their personal lives. As this is proof of intrinsic motivation for improvement, the personal commitment to pro-environmental change and the supportive company culture can be considered the main reason for Company Bertha's overall positive perception of electrification.

By contrast, participants of Company Albert and Company Carl expressed their rather negative perceptions of electrification, which sets them at the other end of the spectrum. For these participants, electrification stands for uncertainty and the potential loss of their jobs. Compared to Company Bertha, they do not feel like being part of a pro-environmental movement but as the victims of political decisions. With their professional future unclear and doubts concerning the basis of political decision-making, participants of Company Albert and Company Carl perceived electrification negatively. The most evident reason can be found in the companies' individual backgrounds: both Company Albert and Company Carl are traditional automotive companies that mostly focus on the production of conventional drivetrains, namely ICE and ICE-components. Through these traditional products and cultures, participants of these companies perceived electrification as a significant threat to their professional lives and to their companies. Employees and managers of Company Carl and Company Albert take pride in their products and in their companies' heritage. However, since electrification constitutes an immense threat to this heritage of traditional automotive companies, participants were found to develop fears and uncertainties, causing them to reject electrification.

6.1.1.2 Different perceptions of electrification between managers and employees

In answer to the question of how managers and employees perceive electrification differently, it can be stated that based on this thesis' findings, managers and employees within one company have very similar perceptions of electrification and pro-environmental changes. This is a significant finding since the traditional change literature strongly differentiates between manager and employee-related change perceptions by stating that in most cases, managers make strategic change decisions and subsequently try to persuade employees for their proposed changes. This means that, usually, managers perceive their proposed changes positively, while employees perceive those changes negatively and sometimes even resist them (Wagner, 2006). However, regarding electrification and its inherent pro-environmental changes, this thesis' findings challenge the usual differentiation between manager and employee change perceptions since a symmetry between the perceptions of the two groups was found in the case study companies.

Company Albert's manager participants were found to have mixed feelings regarding electrification. On the one hand, electrification was perceived as an immense outside pressure and a difficult change for the organisation that threatens many business areas and thus might have a negative impact on employment figures and on the overall economic performance of Company Albert. Managers of Company Albert especially emphasised that the simplification of electrified drivetrains poses a significant challenge for their company. On the other hand, managers at Company Albert reported perceiving electrification as an opportunity since this change allows smaller companies to expand and venture into new markets (Akhmetshin et al., 2018; Block et al., 2013; Grosheva & Naumkin, 2013). Based on the comments of Company Albert's managers, it can be expected that employees at Company Albert share these perceptions since the company's opportunity to venture into new markets also promises current employees a stable employment relationship. Unfortunately, the employee group of Company Albert could not be accessed, and thus, observations and opinions from their managers were taken to estimate their perceptions as well as possible to support this statement.

Within Company Bertha, managers and employees were found to perceive electrification similarly positive. Both groups supported electrification and perceived this change as a viable opportunity to combat the high CO₂ emissions of automotive companies. Company Bertha's corporate culture was very focused on the idea of serving the public with their innovations and technologies. This was a factor that facilitated the positive perception of electrification for both

managers and employees. Based on these findings in Company Bertha, it can be suggested that a green corporate culture can facilitate pro-environmental changes better and thus create more support and excitement for pro-environmental changes like electrification. This thesis' findings regarding green corporate cultures facilitating pro-environmental behaviour are in line with previous literature stating that there are connections between companies' mission and culture and their respective performance (Alas & Vadi, 2006; Armenakis & Bedeian, 1999; Armenakis et al., 2007; Kenny & Reedy, 2006; Twati & Gammack, 2006).

The perceived outside pressures exerted by politics and society were found to create substantial uncertainties for managers and employees alike at Company Carl. While submitting to green outside influences is no anomaly for companies (Fernandez-Feijoo et al., 2014; González-Benito & González-Benito, 2010; Helmig et al., 2016; Wolf, 2014; Yu & Choi, 2016), electrification constitutes a different challenge, and especially the participants of Company Carl perceive the green technologies connected with electrification as inferior to ICEs. This thesis found that employees at Company Carl were concerned with the new drivetrain technologies and the missing infrastructure to support the new technologies. Moreover, manager participants estimated that approximately 60-80% of the supply chain are to be made redundant when full electrification is implemented (Erich & Witteveen, 2017). In this regard, this thesis found that electrification constitutes a perceived loss of control for the employee group of Company Carl and thus creates uncertainty regarding job security. The management of Company Carl, however, ensured that all positions of current employees are guaranteed to be maintained until 2029. However, here it was found that the uncertainties created regarding electrification outweigh the statement of the management, a dynamic that is also discussed in the literature (Bordia et al., 2004; French, 2001; Herold et al., 2007; Herzig & Jimmieson, 2006). Consequently, it can be stated that both managers and employees at Company Carl felt limited in their professional and strategic freedom since both parties perceive to follow political and societal influences. Thus, the perception arises that there is a loss of control on behalf of the companies themselves (Dobbs et al., 2015; Wittmann, 2017). Moreover, outside pressures were perceived as a driving force that could potentially lead to a negative impact on the innovative performance of Company Carl regarding the further development of electrified drivetrains (Ahsan & Qureshi, 2021). Pro-environmental goal setting at Company Carl also intensified the employees' negative perception of pro-environmental changes. It was found that employees use car development cycles as reference points for the implementation of pro-environmental changes such as carbon neutrality. Since carbon neutrality must happen within the next 20 years

or within two to three car generations, employees at Company Carl stated that they feel additional pressure regarding electrification.

At Company Carl, a generally negative perception of electrification was observed on the part of the employees as much as on the part of the managers. Interestingly, the outside pressure imposed on them by politics and society was the only reason provided by both participant groups. Additionally, managers estimated that approximately 60-80% of the supply chain are to be made redundant when full electrification is implemented (Erich & Witteveen, 2017). For employees, the negative perception was further induced by the questionable basis for decision-making consulted by politicians. The short period of time during in which electrification has to be accomplished and the threat of losing employment were additional reasons behind the negative employee perception of electrification.

Overall, in response to this first research question, it can be concluded that the perception of electrification appears to differ more strongly between companies than between hierarchies. The predominant feelings of uncertainty and fear observed at Company Albert and Company Carl are expressed in the negative perception of electrification. Neither company has an alternative business unit that would provide for the company to survive should the transformation towards electrification fail. In contrast, electrification is not new to Company Bertha and its broad product range, which explains why electrification is perceived positively. Since electrification represents a challenge that must be met by the entire company rather than by managers or employees separately, company affiliation was found to have a stronger effect on the perception of electrification than hierarchy.

6.1.2 Communication of conventional changes

One objective of this thesis was to understand how the study participants perceive electrification as a pro-environmental change and how this change is ultimately communicated in automotive companies. However, to understand how electrification is communicated and to what extent the communication of the new pro-environmental changes differs from conventional communication, an understanding of how conventional changes are communicated in the case study companies had to be established first.

To answer the research question of how conventional changes are communicated in the three automotive companies, it can be stated that all companies rely on well-established communication processes by applying pre-defined communication methods and channels for every conventional change they face. The most significant finding regarding conventional change communication was that internal communication processes and the respective change communication channels in the three companies are almost identical or only differ slightly from each other. While the three companies value different communication channels, the general communication processes and the similarity of the applied communication channels is a significant finding. Two different dynamics can explain the similarity of communication processes and the applied communication channels. Firstly, pre-defined communication processes enable the reduction of complexity of changes and allow the recipients to feel a sense of familiarity (Cram et al., 2016; Fdhila et al., 2015; Hagger et al., 2020; Jones & Harvey, 2017; Varney, 2017). Secondly, pre-defined communication processes lead to a decrease of additional employee uncertainty that could emerge from unfamiliar communication practices (Men, 2014, 2015; Schulz-Knappe et al., 2019; Tourish & Hargie, 2009; White et al., 2010).

Furthermore, a significant finding was made by this thesis regarding the integration of information communication and sensemaking communication during conventional changes at the companies. All participants from the three automotive companies stressed the fact that a high level of information is required by change communication recipients and thus, sufficient information must be communicated to the employees (Allen et al., 2007; Armenakis & Harris, 2002; Daft & Lengel, 1986). Moreover, the companies also put a strong emphasis on the involvement of employees in the change processes. In addition to the provided information regarding a change, employee involvement is applied as an additional sensemaking component. Employee involvement as a sensemaking component to conventional change communication was found to support the employees in order for them to understand why a change is happening at their company. Thus, sensemaking in the sense of the extant literature is practised in all three companies (Lüscher & Lewis, 2008; Van Vuuren & Elving, 2008; Weick, 1995). However, through the involvement of the employees, a new angle to sensemaking communication was found by this thesis.

6.1.2.1 Differences in conventional change communication between the three case study companies

In answer to the research question regarding whether there are differences between the three companies and their communication of conventional changes, this thesis has found strong similarities regarding the companies' applied communication processes. However, differences were identified regarding the applied communication channels.

All three automotive companies were found to use similar pre-defined communication processes when communicating conventional changes. Moreover, the three companies use pre-defined communication channels that are firmly integrated into the respective communication routines and processes of the companies and have a recognisable character for the recipients of change communication. However, while the applied change communication processes are similar between the three companies, this thesis has found that the companies put a different amount of emphasis on the importance of different communication channels within their processes. This can be explained by their underlying perceptions of monologic and dialogic change communication and the degree to which managers want to involve their employees in the change communication process.

The companies' sizes played an additional role in the design and execution of the communication processes. Participants at Company Albert, a smaller company, reported valuing dialogic channels like face-to-face communication more than other change communication channels. Larger corporations like Company Bertha and Company Carl apply more monologic communication channels like email communication and town-hall meetings held in a lecture style. Consequently, this thesis found that not only the choice of communication channels is influenced by the companies' size but also the participants' varying perceptions of what monologic and dialogic change communication is.

6.1.2.2 Perceptions of conventional change communication

The answer to the research question of how conventional change communication is perceived by both participant groups is that all manager and employee participants were satisfied with their conventional change communication processes and their inherent communication channels.

This thesis found that all participants generally have a high level of identification with their conventional internal communication processes and perceive a sense of pride in their companies' processes. Managers and employees alike perceive these processes as a security measure that has the potential to reduce any uncertainties regarding upcoming changes (Cram et al., 2016; Fdhila et al., 2015; Hagger et al., 2020; Jones & Harvey, 2017; Varney, 2017). The three automotive companies were found to have varying philosophies regarding the applied change communication channels. Therefore, the representation of an underlying communication philosophy through a respective communication channel is perceived very positively by all participants and was found to increase the employees' identification with their company.

Despite the shared trust of managers and employees towards the companies' change communication processes, employees of Company Bertha and Company Carl can perceive conventional change communication negatively when their managers do not communicate all required information regarding a change or when the employees do not understand the underlying sense of why they must change. While employees of Company Bertha and Company Carl generally trust their managers' conventional change communication, external information communication can also potentially impact their perceptions and could trigger distrust and uncertainties.

To sum up, it can be concluded that all companies rely on similar conventional change communication processes, even though they apply different communication channels depending on the respective company size. Since the communication channels appear to be well chosen, they help to provide structure, familiarity, and security to the workforce in times of change, resulting in an overall positive perception of conventional change communication across all three companies.

6.1.3 Communication of pro-environmental changes related to electrification

In answer to the research question of how pro-environmental changes related to electrification are communicated in the three automotive companies, this thesis found that all three companies abandon their conventional communication processes and apply an ad-hoc change communication approach instead, which resembles crisis communication. Moreover, all three

companies created new communication methods that are specifically applied to communicate electrification internally.

6.1.3.1 Differences between the communication of electrification and conventional change communication

In response to the research question relating to differences between the communication of electrification and conventional change communication, it can be said that this thesis found that the applied communication methods regarding electrification are vastly different to the three companies' conventional change communication methods.

When communicating electrification, the three automotive companies do not follow their usual communication processes but introduced new communication methods like tactile communication, the creation of automatisms, pro-environmental goal setting, and waterfall communication. These actions can be explained by the fact that the three companies were focused on conveying the most important messages regarding electrification to their employees. Thus, they were found to tailor their new communication approaches to this specific change to also create an urgency for their employees. As mentioned above, the nature of these new communication processes resembled ad-hoc crisis communication, which mostly focuses on conveying the most important information in a short period of time or simply aim to create an urgency for the upcoming changes.

6.1.3.2 Differences between companies' applied communication methods regarding electrification

To answer the research question of how and to what extent the communication of pro-environmental changes related to electrification differs between the three companies, it must be stated that this thesis has found that by contrast to their conventional change communication strategies, the companies communication approaches regarding electrification differ strongly from each other.

Firstly, it must be said that the initial response to communicate electrification of all three companies is rather similar. All companies were found to abandon their conventional communication processes and instead replaced them with new communication methods once

they faced the task of electrification-specific change communication. The companies chose new communication channels to convey their overall strategic objective regarding electrification to their employees. However, while the initial response to communicate electrification might be similar across the three case study companies, the newly applied communication methods differ strongly between the three companies.

Employees in all companies were found to have a high demand for information-rich communication thus externally communicated information regarding electrification was appealing to employees of all organisations. However, since externally communicated electrification-related communication is not always consistent with internal communication, companies were found to fight misinformation or wrongly interpret media messages. At the same time, the literature suggests that some external media communication can help organisations create positive internal perceptions regarding changes (Lin et al., 2016; Macnamara & Zerfass, 2012). However, this was not the case for the organisations in this study, which were found to communicate information that tried to relativise the information communicated through public sources.

Another finding regarding the character of the change communication regarding pro-environmental changes was the fact that none of the companies applied a persuasive tone to their communication or tried to offer incentives to their employees in order to persuade them to engage in the pro-environmental changes. This can be explained by the fact that a persuasive communication strategy is not needed to communicate electrification since electrification has emerged from outside of the companies. Instead, Company Albert and Company Carl were found to involve their employees in the change communication process to facilitate a buy-in from their employees and to explain the underlying sense of this pro-environmental change. These findings are in line with the literature suggesting that employee involvement in the change and the change communication process can increase their acceptance of or willingness to change (Brown & Cregan, 2008; Hussain et al., 2018; Morgan & Zeffane, 2003; Sharif & Scandura, 2014; Sims & Sims, 2002).

The main finding of this thesis regarding the specific communication of electrification is that the companies abandoned all established communication practices and strategies and applied new processes and channels specifically to communicate electrification. Company Albert, for instance, used a new communication method which was described as a form of tactile

communication. While this communication technique is a novelty in change communication, especially in German automotive companies, the literature on embodied learning suggests that a sensory and tactile component can indeed increase the understanding and thus the urgency among the recipients since there is a strong identification and connection with the communication content (Brocklesby & Mingers, 2005; Horn & Wilburn, 2005; Maturana & Varela, 1987; Rosch et al., 1991). Moreover, the ‘event character’ of this communication can also have positive impacts on the recipients’ understanding of the change and consequently increase their involvement (Pine & Gilmore, 1998a, 1998b; Poulsson & Kale, 2004; Yeoman & McMahon-Beattie, 2019).

At Company Bertha, it became apparent that many electrified products were already produced at their company sites, which meant that compared to Company Albert and Company Carl, fewer product-related changes had to be made at Company Bertha. Thus, Company Bertha’s management did not have to create a sense of urgency for their employees like that created by Company Albert and Company Carl. However, for Company Bertha to become a carbon-neutral organisation, employees were required to adjust their way of working and engage in more pro-environmental actions that would lower the overall ecological impact of Company Bertha. The communication approach applied in this regard was described as a strategy that would enhance pro-environmental behaviour through the physical and verbal demonstration of ‘pro-environmental automatisms’. This strategy required managers to demonstrate to their employees which actions could be taken in their respective departments to save energy and thus lower the overall ecological impact of their company. Like the applied tactile communication at Company Albert, the creation of pro-environmental automatisms at Company Bertha also required the communicator to engage in physical demonstrations and thus apply a bilateral exchange between managers and employees in order for the recipients to create a memorable learning experience that could be incorporated in their day-to-day work life. This specific communication approach at Company Bertha can be very effective when considering the understanding of previous research that creating automatisms to increase pro-environmental behaviour is a viable form of communication that has been proven to work in the past (Bamberg & Möser, 2007; Hargreaves, 2011; Robertson & Carleton, 2018). Furthermore, the findings of this thesis are in line with the literature, which states that authority figures who encourage their recipients to take action on their own by presenting and representing the right pro-environmental behaviour will ultimately lead the recipients to be more motivated to perform

pro-environmental behaviour on their own (Gifford & Nilsson, 2014; Osbaldiston & Sheldon, 2003; Robertson & Carleton, 2018).

Lastly, a communication strategy was found to be used at Company Bertha and Company Carl to further communicate and motivate employees for pro-environmental changes. This communication approach was called ‘pro-environmental goal setting’ and had the objective of setting reachable and realistic pro-environmental goals with which employees in the respective companies could identify. In the case of Company Carl, this communication approach uses measurable company goals focusing on the CO₂ exhaust of both their products and production processes. Managers at Company Carl emphasised that these pro-environmental goals need to be feasible and achievable to be motivational for their employees (Abrahamse et al., 2007; Gifford & Nilsson, 2014; Rabinovich et al., 2009; Staples et al., 2020; Steg et al., 2014). In the case of Company Carl, however, it was found that this company also abandons its usual change communication process to communicate pro-environmental goals. However, no new communication approach like tactile communication was applied, and pro-environmental goals were communicated with ‘waterfall communication’ in a top-down manner in order to reach all employees, including manual workers without access to internal email communication or the social intranet (Baker, 2007; Bel et al., 2018; DiFonzo & Bordia, 1998; Klein, 1996; Kotter, 2008). Moreover, waterfall communication also means that aspects of goal setting communication can be adjusted for each department, including the severity of the pro-environmental change that needs to take place in each department. This enables tailoring of pro-environmental goals for each department and thus engagement with employees on each level to keep them motivated regarding changes.

6.1.4 Perceptions of electrification - specific communication

Lastly, to answer the final research question regarding the participants’ perception of the newly applied communication methods, it can be stated that especially the employee participants perceived these new communication methods negatively. Employees felt that the new communication methods constituted an additional change to electrification and were thus sceptical.

6.1.4.1 Differing perceptions regarding the communication of electrification between the three case study companies

To answer the research question as to how the perceptions of the newly applied communication methods differ between the three automotive companies, it can be stated that they are perceived very differently between the case study companies.

This thesis found that the newly used communication channels that were created to communicate pro-environmental changes more effectively also created uncertainty among the employees. Employees of Company Bertha and Company Carl perceived their managements' pro-environmental goal setting as negative. Especially employees of Company Carl were found to be frustrated with the pro-environmental goal communication of their company, perceiving that the goals were made up or not feasibly applicable to real-life scenarios in their companies. While previous research has stated that pro-environmental goal setting is often directly linked to subsequent positive environmental behaviour of the recipients (Baard & Björnberg, 2015; Staples et al., 2017; Staples et al., 2020), this was not the case for the participants of this thesis. Especially employees of Company Carl perceived the pro-environmental goal communication of their management as exerting additional pressure because they perceived that the established goals of their management were unattainable and unrealistic. Employees at Company Bertha were also unsure how their company wants to attain the proposed pro-environmental goals and thus suggested that break plans could solve this problem. These break plans would require the management to give employees feasible and achievable goals in two-week intervals, thus keeping the goals up to date and creating the understanding that everyone's contribution to the goal achievement is transparent.

Furthermore, some employees of Company Bertha do not approve of or support newly created communication approaches even though they support pro-environmental changes. Company Bertha's employees rejected the newly applied communication channels since they were familiar with the established conventional communication methods of Company Bertha. Therefore, Company Bertha's employees were found to distrust new communication methods, which led to a generally negative perception of these communication channels. These findings are in line with literature that suggests that only established communication channels can provoke trust for a change venture (De Ridder, 2004; Elving, 2005; Scholz & Scholz, 2018). Moreover, employees of Company Bertha were used to receiving change-related

communication from designated change project teams. These teams were also missing during pro-environmental goal communication, and thus, a further source of negative perceptions and distrust emerged among this employee group.

Company Carl's employees were also found to distrust the newly applied communication methods for communicating electrification. In addition to the distrust regarding the pro-environmental goal setting at Company Carl, employees at this organisation were found to perceive pro-environmental change communication as inconsistent in relation to the subsequent behaviour of their management. Managers at Company Carl required their staff to change in a pro-environmental way but were subsequently found to fly frequently to short- and long-distance destinations on company expenses. This behaviour provoked uncertainty and distrust, a development that is also described in detail in the literature (Ayub et al., 2014; Ford & Ford, 1995; Ford et al., 2008; Kotter, 1996). A further source of distrust was found at Company Carl and originated from vague communication regarding layoffs connected to electrification. While between 1000 and 2000 manager positions were cut at Company Carl because of electrification, no employee positions were impacted until this point. However, the management was not clear as to whether employee positions would be affected in the future, and therefore uncertainty and distrust towards electrification-related communication were found to emerge (Allen et al., 2007; Bel et al., 2018; Daft & Lengel, 1986; DiFonzo & Bordia, 1998; Jimmieson et al., 2004; Kitchen & Daly, 2002; White et al., 2010).

As a concluding remark regarding the participants' perceptions of the new communication methods regarding electrification, it can be stated that the employee group generally distrusted their managements' newly applied change communication methods and perceived them as an additional uncertainty of electrification. The special treatment of electrification as a pro-environmental change overwhelmed many employee participants who could not understand why so much importance was attached to the communication of electrification and why new communication methods and approaches were taken. On the other hand, the managers perceived electrification as a great challenge and a demanding change that required special communication approaches to make the significance of this change as clear as possible to their employees.

6.1.4.2 Differing perceptions between managers' and employees' perception of pro-environmental change communication

To answer the research question of how managers and employees perceive pro-environmental change communication differently, it can be stated that, generally, employees perceive the newly applied change communication negatively because of its inherent inconsistencies and vagueness. Managers at Company Albert and Company Carl perceived the new communication techniques as suitable approaches for externally communicating pro-environmental changes to reach potential future employees and thus appeal to young professionals and graduates who value pro-environmental actions of companies.

These findings are in line with the literature, stating that change communication has the potential to target internal and external stakeholders alike and that especially pro-environmental changes are appealing to young professionals and graduates (Welch, 2012; Welch & Jackson, 2007). However, upon reflecting on the current change communication regarding electrification, Company Albert and Company Carl managers perceive that manual workers are not accessible via the current communication measures. Thus, it is perceived that a diverse body of employees requires a diverse communication approach, including communication tailored for manual workers. This understanding is also present within the current literature, stating that tailored communication has the potential to improve employee support for changes and to enhance employee commitment to the proposed changes (Barrett, 2002; Husain, 2013; Johansson & Heide, 2008). This thesis found that managers and employees did not share similar perceptions of the newly applied communication practices, which resulted in the final understanding that a communication process that is well-known among employees is a useful tool for facilitating new changes, while newly applied communication methods can create additional uncertainty among the recipients of change communication.

Consequently, considering the findings regarding the difference between companies and the differences between hierarchies with regard to the perception of change communication of electrification, it can be concluded that the overall perception is negative, yet this feeling is stronger on the employee level than on the manager level. While no one appears to be satisfied with the newly applied ad-hoc communication methods in contrast to the conventional change communication, some managers try to use pro-environmental change communication to their advantage by attracting new employees. Finally, this thesis found that the combination of a

negative perception of electrification in addition to the use of unfamiliar new communication methods has led to a negative perception of change communication of electrification.

6.2 Reviewing the data collection process and the interviewing phase

In late 2017 and early 2018, it became apparent that the ongoing shift in German society and political decision-making towards greener mobility required automotive companies to act. Thus, companies shifted their attention towards increased production of electrified engines and other emission-free drivetrains.

At that time, contact was established with several automotive companies to negotiate access for the initial research proposal that aimed to study communicative styles in gender-dominated departments in automotive companies. While automotive companies showed interest in the initial research idea, all parties realised that the automotive industry was facing more pressing questions at that time. Therefore, it became apparent that electrification as a change was a pressing and current topic in automotive companies and that this thesis constituted a unique chance to study electrification first-hand in German automotive companies. Thus, this thesis constituted an excellent opportunity to explore a new change in an industry that was previously somewhat protected from radical and externally driven change before. A positive effect that resulted from this change of topics was the sudden increased interest of the company contacts, who were very enthusiastic about the topic and helped to facilitate access to their companies and ultimately the research process. After proposing the new study topic on the perceptions and communication of electrification, company access was discussed with representatives of six automotive companies. Ultimately, these companies allowed some access to their sites, but after lengthy negotiations, only three companies (Company Albert, Company Bertha and Company Carl) allowed interviews with both their employees and managers. However, as the on-site data collection process commenced, Company Albert withdrew its offer to interview their employees. A contact person from Company Albert offered a new contract allowing the researcher to interview employees as well, but the new contract also stated that the study could only take place at Company Albert without considering other automotive companies and the findings would have to be presented exclusively to Company Albert. Therefore, this offer was declined, and it was explained to Company Albert's representatives that such a contract would

limit this thesis' scope since its goal was to consider a variety of automotive companies to observe how electrification differently impacts automotive companies.

Another problem that was sometimes encountered with company representatives was managing their expectations of what this study could contribute to an individual company. Some representatives thought that this thesis could reveal other companies' strategies regarding the communication of electrification and their consequent strategies for dealing with electrification. In these circumstances, it had to be explained to these participants that this study could not reveal any company names or individual names since the researcher was subject to ethical rules and procedures guaranteeing the anonymity of all study participants and organisations. Furthermore, a few managers thought that they could directly understand how electrification should be communicated most effectively in their companies through the findings of this thesis. In these circumstances, it had to be explained to managers that this thesis could give recommendations on communicating electrification internally, but that the explorative element of this study would instead focus on perceptions and initial company responses to this change since this study never intended to identify a benchmark for communicating electrification and pro-environmental changes.

6.3 Study limitations

This study constitutes the first attempt to capture an understanding of how electrification as a change is communicated and perceived in automotive companies in South-West Germany. While this study obtained a substantial insight into the three considered automotive companies, some limitations emerged during the research process and shall be assessed in this section.

The applied case study structure aided the process of exploring perceptions and strategies regarding the communication of electrification. However, only three automotive companies were considered for this thesis. To capture a complete understanding of electrification in the German automotive sector, more companies need to be considered that are impacted by this change.

Moreover, it must be mentioned that this study tried to capture the first insights into the communication side of electrification in South-West Germany. Therefore, a limitation emerged

through the scarce presence of literature regarding the communication and perception of electrification. To overcome a lack of established and developed theoretical foundations for this thesis' topic, an explorative study approach was chosen to first gather knowledge on this subject and lay a foundation for future research considering the communication of electrification as an unprecedented change in the German automotive sector.

This thesis had the objective of considering an employee group and a manager group from each of the three companies included in the case study. However, it is apparent that the employee group from Company Albert is missing. This was a major drawback since the employees from Company Albert were an analysis group whose perceptions and experiences could have contributed greatly to this thesis. Without the permission of Company Albert's work council, however, contacting or trying to access the employee group of Company Albert was not possible. At the same time, Company Bertha only allowed three manager interviews, after which the management became concerned that too much internal and sensitive information would be at stake if all of the planned interviews with managers at Company Bertha were completed. Even though Company Albert and Company Bertha each agreed to a set number of ten employee and ten manager interviews in the beginning, the companies withdrew their agreements during the data collection processes, pointing to the sensitive nature of the research focus and the pressures that electrification introduces. While the missing employee interviews at Company Albert could not be substituted, the drawbacks that emerged from this situation only had a limited effect on this thesis. Managers at Company Albert were very open, and even they did not understand the work council's decision to deny access to the employee group. Thus, the managers reported on their experiences with their employees regarding electrification and reported from their perspective how their employees might perceive new pro-environmental changes and their communication. Moreover, the head of the work council, who is the representative of all employees of Company Albert, was interviewed, and therefore a general understanding of Company Albert's employees' perceptions was obtained. Moreover, this thesis' data triangulation with company documents helped to gain further insight into the employees' perceptions.

No more manager interviews at Company Bertha could be held after the first three were conducted. Therefore, substitute manager interviews were held at companies similar to Company Bertha, namely Company Dora, Company Emil and Company Friedrich. In those companies, five interviews were held with managers with the same job description as the

managers that would have been interviewed at Company Bertha. These interviews were held in order to gain a general idea of communication strategies regarding electrification. These interviews were not included in this thesis' case study report. However, these additional interviews were conducted to give an additional perspective on whether electrification is communicated and perceived similarly or differently in other German automotive companies. Since the managers at Company Dora, Company Emil and Company Friedrich are very influential managers, and similarly shape the future of the automotive industry like managers of the three case study companies, their interviews provided additional insight into how electrification impacts other companies and how they perceive this change. After having conducted the manager interviews at Company Dora, Company Emil and Company Friedrich, it was concluded that the managers of these automotive companies perceive electrification similarly to those of the case study objects and that electrification also poses similar challenges to these companies. As mentioned before, this thesis also applied data triangulation by considering secondary data such as company and government research. However, it was not possible to fully include secondary data sources into the appendix since the anonymity of the companies would have been lost if any of these documents were to become public through this thesis.

Considering all of the limitations that have emerged throughout the study and research process of this thesis, it can be concluded that this thesis constitutes a first step towards researching the communication and perception of electrification and has produced findings that are likely to have applicability across the automotive sector.

6.4 Practical implications

Even though this study applied an explorative approach focusing on the perceptions and experiences of the study participants, it was never the main goal to derive a universal textbook approach dictating how electrification should be communicated. However, through the findings of this thesis, relevant conclusions were drawn, pointing out some practical recommendations that could help automotive companies to effectively communicate pro-environmental changes.

One suggestion that can be made based on this thesis' findings is that any external media communication regarding change communication should equally be considered as internal

communication since employees frequently access both sources of information. Being invested in their companies' development regarding electrification, employees do not content themselves with the information provided internally, but they also consult external publications. Therefore, companies should be mindful when communicating to third parties using public communication methods, as they are equally accessed by uninvolved third parties as well as their own employees. In the specific case of communicating pro-environmental changes, this thesis has also established that some companies use external communication for recruiting purposes since young professionals and university graduates are found to highly value a company's pro-environmental engagement. Therefore, automotive companies should address these efforts in their external communication to appeal to an employee target group that is motivated to drive and shape electrification.

Moreover, companies should create a straightforward narrative as to why they apply different communication methods to the current change in comparison to previous changes. This thesis has found newly applied communication methods generate an additional layer of change for recipients, aggravating their perception of the change situation even further. Therefore, employees need to be educated on why familiar change communication strategies are no longer applied, when it comes to communicating electrification, and how these new communication methods will aid the companies in communicating to all staff most effectively.

A further practical implication can be made regarding the newly applied communication methods that are used in the three automotive companies. Tactile communication, the creation of automatisms and pro-environmental goal setting have shown great potential to communicate pro-environmental changes since they are specifically tailored for the communication of pro-environmental changes. These communication methods have been shown to foster a feeling of urgency among recipients, confirming the necessity to change. Simultaneously, those tailor-made communication methods allow managers to create a narrative regarding how pro-environmental changes impact the companies' products and their day-to-day business.

A further recommendation can be drawn from this thesis' findings regarding political decision-making during electrification and pro-environmental changes. A significant degree of resistance towards change and rejection of electrification on the part of the employees is generated or at least intensified by the non-transparent decision-making of politics. This thesis found strong evidence that explaining the reasoning to the affected professional groups or even

involving them in the decision-making process would positively affect their responses to the governmentally commanded change. While enhanced transparency is important, the new environmental requirements and regulations must also be explicit and accessible to the automotive companies. Especially the cooperation between European lawmakers and the German government needs improvement for companies to better grasp what laws and regulations they need to fulfil at which point in time. In order for companies to understand the laws of numerous governing bodies, they must consult many resources in a time-consuming effort. With clearer and more coherent communication from governing bodies, much uncertainty and frustration on behalf of automotive staff could be mitigated.

6.5 Concluding remarks on electrification and recommendations for future research

This thesis has presented one of the first insights into automotive companies' applied communication strategies and practices regarding the change communication of electrification and the participants' perceptions of pro-environmental change. Many study participants of the automotive companies were found to perceive electrification as an outside pressure, driven by a public narrative led by politics and society. Therefore, future research should focus on the driving forces behind electrification and study the linked motivations for this change by considering political decision-making and social motivations for greener mobility. This approach could obtain a clear understanding of how public mobility needs and economic needs in relation to pro-environmental change can both be fulfilled.

While this study focused on one OEM and two supplier companies, many more companies in Germany require social science attention when considering electrification and its subsequent communication. Future research should focus on metal supplier companies from the Rhein-Ruhr region who also actively shape the German automotive industry and are equally impacted by electrification. Moreover, future research regarding electrification should consider German technology and chip manufacturers, which in the future will be at the centre of the German car industry once electrification is implemented.

One significant finding of this thesis was that conventional change communication strategies were almost entirely abandoned when automotive companies were faced with the

communication of electrification. While some previous research has presented findings which indicate that companies abandon their established communication practices when faced with a crisis (Heide & Simonsson, 2014; Jarzabkowski et al., 2019), there needs to be more research regarding the underlying processes and strategies that German automotive companies can apply as a ‘quick response’ to radical internal and external changes. Moreover, future research should consider how newly applied work forms and office concepts, such as agile transformations, can enhance communication speed and quality, and whether agile automotive companies can ultimately respond differently to radical internal changes like electrification, as compared to hierarchical organisations. Regarding the abandonment of conventional change communication processes, future research should also consider why companies who are facing radical changes no longer apply conventional change communication methods if this would provide familiarity and security to employees, as this thesis suggests.

To further understand the motivations for the observed change in communication methods, future research should study the communication methods applied to address the other big transformations the automotive industries is confronted with: digitalisation and autonomous driving. It would be interesting to apply similar research questions to explore, for instance, whether conventional or new communication methods are applied.

This thesis found that employees have a very high demand for information and are thus invested in obtaining news about changes through public media. Employees are also critical of newly created internal communication strategies that do not resemble previously applied change communication measures. This thesis has specifically shown that new communication measures that are different to conventional communication strategies can provoke additional uncertainty and resistance. Future studies should therefore further explore and consider whether certain communication channels applied in pro-environmental change and crisis communication can decrease employee resistance.

This study has also found that automotive companies’ external communication regarding electrification and pro-environmental changes is appealing to university graduates and young professionals. Therefore, future studies concerning external communication of pro-environmental changes should also study how pro-environmental change communication can be used as a recruiting tool targeting young professionals and university graduates. In this regard, future studies could also focus on communication channels or approaches that can

reduce the information disparity between externally communicated change messages and internal change communication.

As a concluding remark, it must be noted that electrification as a pro-environmental change has only just begun, and time will tell which drivetrains and communication methods will finally allow this change to be implemented effectively. It is the responsibility of consumers and companies to be mindful of our resources. While driving provides the ultimate freedom for many citizens, it can also take away the freedom of individuals living in parts of the earth most affected by climate change. Companies, politics, and society are also responsible for German employees working in the automotive industry. They should therefore build sustainable and secure workplaces in the future in order for the automotive industry to remain the backbone of South-West Germany's industry and the driving force for the wellbeing of the German working and middle classes.

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Appendices

I Appendix A: General research materials and documentation presented in Chapters One, Two and Three – Figures and Tables

Table 1- Contacted automotive supplier companies

Company	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Supplier 5
Description	Automotive supplier company traditionally focusing on the production of cylinder head gaskets	Automotive supplier company, conglomerate active in many different areas of automotive production, but focusing on fuel and diesel powertrain systems	Automotive supplier company focusing on the production of gears and gearboxes as well as pistons, differentials and connecting rods	Automotive supplier company focusing on the production of pistons, bushing, gaskets, oil filters and bearings	Automotive supplier company focusing on the production of small engine solutions as well as the production of injection systems
Access to managers	Yes	Yes	Yes	Yes	Yes
Access to employees	Yes	Yes	No	No	No

Table 2- Full and partial access to automotive companies

Company	Company Albert (Supplier 1) >15,000 employees	Company Bertha (Supplier 2) <400,000 employees	Company Carl (OEM 1) <300,000 employees	Company Dora (Supplier 3) >150,000 employees	Company Emil (Supplier 4) >80,000 employees	Company Friedrich (Supplier 5) >15,000 employees
Description	Automotive supplier company traditionally focusing on the production of cylinder head gaskets	Automotive supplier company, conglomerate active on many different areas of automotive production, but focusing on fuel and diesel powertrain systems	Traditional OEM	Automotive supplier company focusing on the production of pistons, bushing, gaskets, oil filters and bearings	Automotive supplier company focusing on the production of pistons, bushing, gaskets, oil filters and bearings	Supplier company focusing on the production of small engine solutions as well as the production of injection systems
Nature of Access	Partial (managers)	Full (managers + employees)	Full (managers + employees)	Partial (managers)	Partial (managers)	Partial (managers)

Table 3 - Ethics in Social Research: The views of research participants

(Graham et al., 2007, p.6)

Before the Interview	During the Interview	After the Interview
Unpressured decision making about taking part	Being able to exercise the right not to answer a question or not to say more than they want to	Right to privacy and anonymity respected in storage, access and reporting of the research
Research is independent and legitimate	An unpressurised pace, time to think	Unbiased and accurate research and reporting
Knowing why they were selected to be approached	Feeling comfortable and at ease, valued and respected, not intimidated or judged	Opportunity for feedback on findings and use
Clear and worthwhile objective, purpose and intended use	Opportunity for self-expression and for own views to be recorded	Use is actually made of the research for wider social benefit
Knowing what to expect and being able to prepare especially in terms of the coverage and questioning style	Questions are relevant, not repetitive, clear	
Openness, honesty, and correcting misunderstandings	Left without negative feelings about participation	

Table 4 - Conventional change communication processes

Company Albert: Conventional change communication process	Company Bertha: Conventional change communication process	Company Carl: Conventional change communication process	Company Carl: Alternative change communication process
Before initiation of communication: Involvement of primary stakeholders (work council and key leaders). Further involvement of team leaders to inform middle to lower leadership as well.	Change initiative starts by forming change idea.	Change initiative starts by forming change idea.	Announcement of change through emails and social intranet posts (very general information about the change without being too specific).
Initiating communication: managers stressed that the first communication has to be personal and direct. No use of email or phone calls.	Change project teams are formed containing a mixture of managers and employees who run the change implementation and communication.	Change implementation through kick-off event, town hall meeting with 1,000-2,000 participants.	‘Waterfall communication’ where the change message is communicated top-down along the hierarchical ladder.
Informing employees through direct communication in a kick-off event or a town hall meeting (1,000-1,400 people).	Change implementation starts with kick-off event and town hall meetings.	Continuous change communication through written communication and social intranet posts.	Team leaders communicate the change to their employees after they are informed by their managers.
Personal communication immediately after town hall meeting in teams (10-50 people). Giving the	Personal communication immediately after town hall meeting in teams (10-50 people). Giving the	Q&A documents answering many questions regarding the change are handed out to all teams	Q&A documents answering many questions regarding the change are handed out to all teams

opportunity for questions and feedback.	opportunity for questions and feedback.		
Emails and phone calls to overseas subsidiaries.	Continuous communication through mailings and social intranet posts.	Personal communication immediately after town hall meeting in teams (10-50 people). Giving the opportunity for questions and feedback.	
Presenting a change schedule to employees which shows future change tasks step-by-step.	Involvement of key leaders to communicate personally to affected teams on a regular basis. Weekly breakfasts or team runs (physical running) during lunchtime.		

Table 5 - Companies change communication processes regarding the communication of electrification

Company Albert: Electrification-specific communication process	Company Bertha: Electrification-specific communication process	Company Carl: Electrification-specific communication process
<p>Controlling external media communication through personal conversations.</p>	<p>Forming a change project team which is in charge of communication regarding electrification.</p>	<p>Controlling external media communication through more frequent and clearer communication via the intranet and employee involvement.</p>
<p>Overcoming internal resistance targeting pro-environmental changes and electrification by assigning specific change and leadership roles to employees in order to enable transparency and employee involvement.</p>	<p>Continuous communication of the goals and milestones which were initially set to cope with pro-environmental changes and electrification. Letting all employees know that within 20 years, Company Bertha has to be emission-free.</p>	<p>Overcoming internal resistance to pro-environmental changes and electrification by involving employees in change processes and presenting them possible consequences of the changes.</p>
<p>Applying tactile communication, using Company Albert's products to demonstrate which products will not be required in electric cars and to create urgency among the employees.</p>	<p>Creating pro-environmental automatisms for employees that are 'lived' by managers who set an example for all staff with their pro-environmental behaviour.</p>	<p>Overcoming further resistance by setting achievable and tangible change goals for employees. For instance, 15% CO₂ reduction by 2025, 30% by 2030 and so on.</p>
		<p>Using waterfall communication to try to inform all staff at the same time and to the same extent.</p>

Figure 1 - Overview of available drivetrain technologies

(PWC, 2017, p.18)





		 ICE	 PHEV	 BEV	 FCEV
Components	Engine	200 kW	160 kW	-	-
	e-Engine	-15-20 kW	-80 kW Peak, -50 kW Cont.	-200 kW Peak, -100 kW Cont.	-200 kW Peak, -100 kW Cont.
	Electric Drive	-	Inverter/DCDC/OBC	Inverter/DCDC/OBC	Inverter/DCDC/OBC
	Tank	~60 l (fuel/synfuel)	~60 l (fuel/synfuel)	-	~5 kg @ 700 bar (hydrogen)
	Battery	<1 kWh (48 V-battery)	~10 kWh (HV-battery)	~60 kWh (HV-battery)	~25 kWh (HV-battery)
Range	Non-Electric	700 km	700 km	-	-
	Electric	-	<50 km	~400 km	~500 km + ~150 km

Figure 2- Theme Structure derived from NVivo analysis

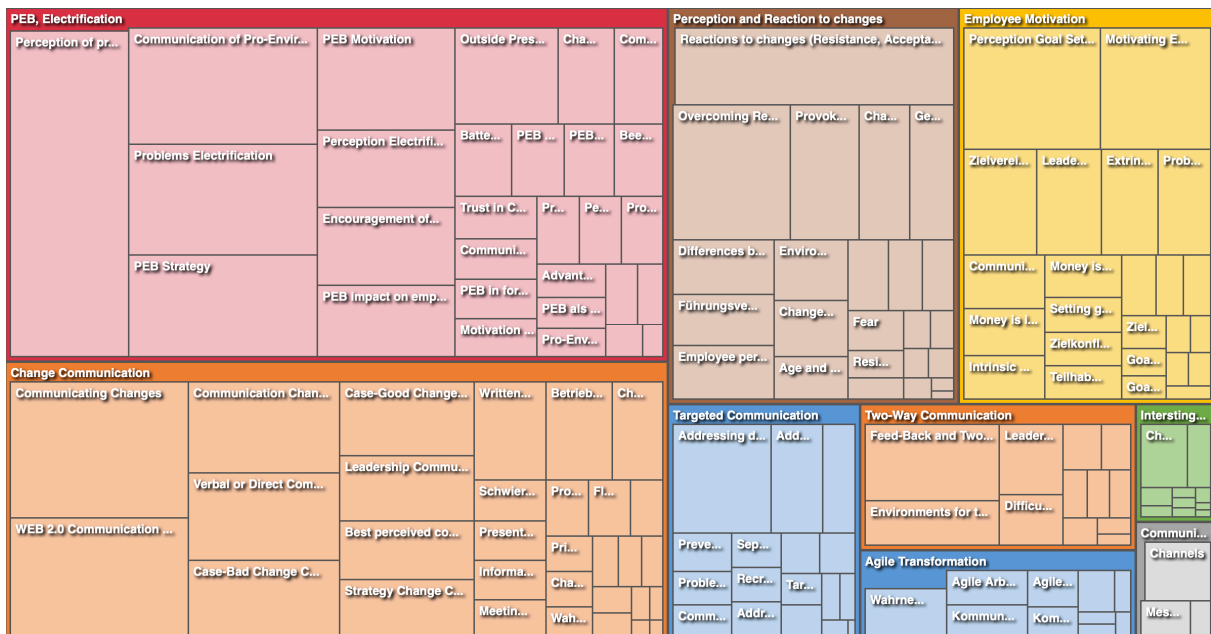


Figure 3 - Klein's change communication process

(Klein, 1996, p.39)

Principles	Unfreezing	Stages Changing	Refreezing
Redundancy and multimedia aids retention	Multimedia campaign delineating rationale, of objectives, planning activities and expectations	Frequent multimedia delivery including outcomes as they occur	Use of media to celebrate success as warranted with phase out as new process is institutionalized
Face-to-face medium is effective	Group meetings at each level of the hierarchy	Group meetings at each level of the hierarchy	Reliance on supervisor at each level to convey change – relevant information with senior management playing a key role regularly but less frequently than in other stages (e.g. awards assembly, semi-annual progress report ,etc.)
Effectiveness of line management as communications channel	See above with senior management of each unit presiding at stage setting meetings	Emphasis on delivering information through line management. Special emphasis is placed on the top and consistent knowledgeable participation of each supervisory level	
Direct supervision as key communicator	Meetings subsequent to stage setting are conveyed and run by unit supervisor		
Opinion leaders as key communicators	Opinion leaders are kept completely abreast of all relevant information through face-to-face meetings	Same as in unfreezing	Same as before
Personal relevance of interpretation	Expectations concerning personal impact of change should be conveyed via unit management and supervisors	As more information becomes known, supervisors disclose relevant personal and job-related information to subordinates. Especially job and role expectations as each person may be affected	This information is becoming increasingly accessible from personal experience but should be conveyed by supervisor when necessary. Clarifying personal impact is essential
Communications should be consistent and reinforcing	All communiqués should carry the same message and be consistent with organization's core values as appropriate	Same as unfreezing except more attention is placed on details as they become known	Reaffirmation of successes in supporting core values and meeting objectives

Figure 4 - Major constituents of sensemaking

(Sandberg & Tsoukas, 2015, p.12)

Major specific constituents of the sensemaking perspective				
<i>Events that trigger sensemaking</i>	<i>Processes of sensemaking efforts</i>	<i>Outcomes of sensemaking</i>	<i>Factors influencing sensemaking</i>	
- Major planned events	- Creation	- Restored sense	- Contexts	
- Major unplanned events	- Interpretation	- Restored action	- Language	
- Minor planned events	- Enactment	- Non-sense	- Identity	
- Minor unplanned events		- No restored action	- Cognitive frames	
- Hybrids of events			- Emotion	
			- Politics	
			- Technology	

Figure 5 – Comparison of state subsidies per electric vehicle

(McKinsey, 2014, p.16)

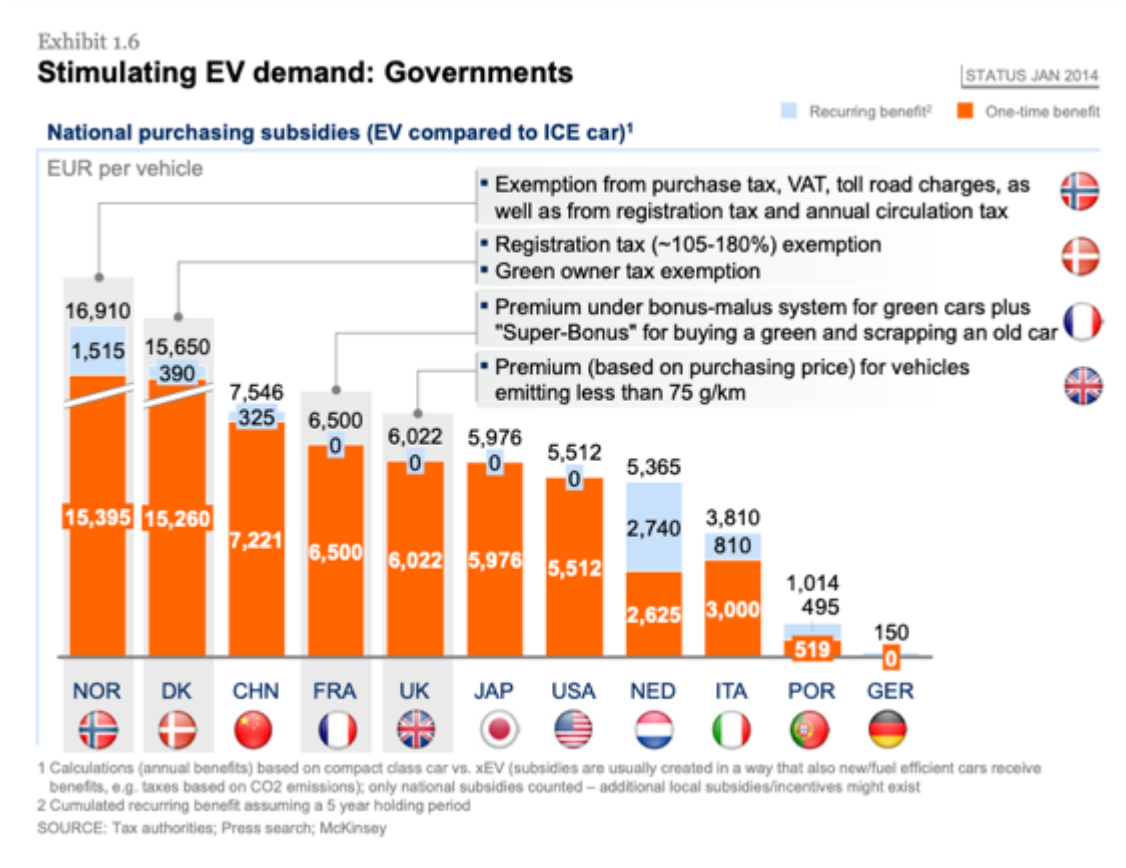


Figure 6 – Country overview of charging stations per 100.000 inhabitants

(Sierzchula et al., 2014, p.189)

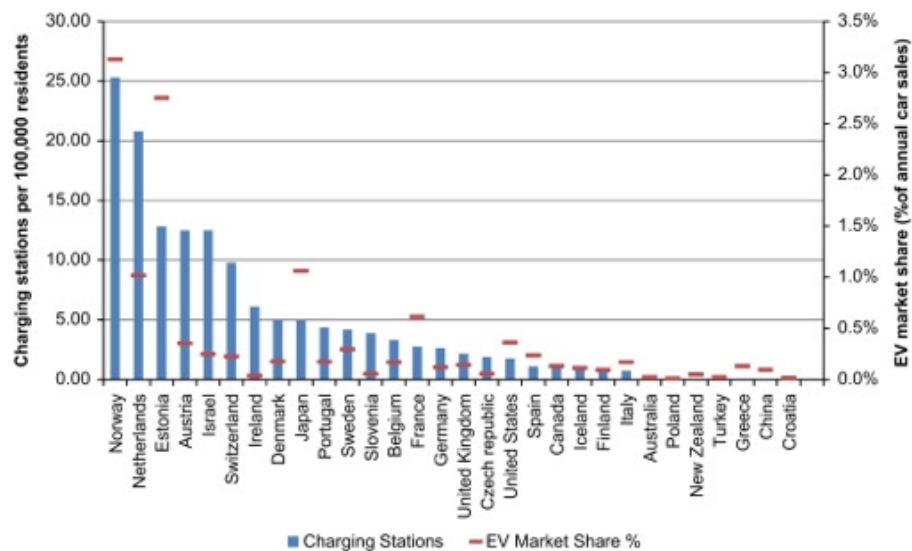


Figure 7 - Important questions to consider for each step of the literature review

(Snyder, 2019, p.336)

Important questions to consider in each step of the review.

Phase 1: design

- Is this review needed and what is the contribution of conducting this review?
- What is the potential audience of this review?
- What is the specific purpose and research question(s) this review will be addressing?
- What is an appropriate method to use of this review's specific purpose?
- What is the search strategy for this specific review? (including search terms, databases, inclusion and exclusion criteria etc.)

Phase 2: conduct

- Does the search plan developed in phase one work to produce an appropriate sample or does it need adjustment?
- What is the practical plan for selecting articles?
- How will the search process and selection be documented?
- How will the quality of the search process and selection be assessed?

Phase 3: analysis

- What type of information needs to be abstracted to fulfill the purpose of the specific review?
- What type of information is needed to conduct the specific analysis?
- How will reviewers be trained to ensure the quality of this process?
- How will this process be documented and reported?

Phase 4: structuring and writing the review

- Are the motivation and the need for this review clearly communicated?
 - What standards of reporting are appropriate for this specific review?
 - What information needs to be included in the review?
 - Is the level of information provided enough and appropriate to allow for transparency so readers can judge the quality of the review?
 - The results clearly presented and explained?
 - Is the contribution of the review clearly communicated?
-

Figure 8 - Guidelines to assess the quality of a literature review

(Snyder, 2019, p.338)

Guidelines to assess the quality of a literature review.

Phase 1: design

- In relationship to the overall research field, is this literature review needed and does it make a substantial, practical, or theoretical contribution?
- Are the motivation, the purpose, and the research question(s) clearly stated and motivated?
- Does the review account for the previous literature review and other relevant literature?
- Is the approach/methodology for the literature review clearly stated?
- Is this the most appropriate approach to address the research problem?
- Are the methodology and the search strategy clearly and transparently described and motivated (including search terms, databases used, and explicit inclusion and exclusion criteria)?

Phase 2: conduct

- Is the search process appropriate for this type of review?
- Is the practical search process accurately described and accounted for?
- Is the process of the inclusion and exclusion of articles transparent?
- Have proper measures been taken to ensure research quality?
- Can it be trusted that the final sample is appropriate and in concordance with the overall purpose of the review?

Phase 3: data abstraction and analysis

- Is the data abstracted from the article appropriate in concordance with the overall purpose of the review?
- Is the process for abstracting data accurately described?
- Have proper measures been taken to ensure quality data abstraction?
- Is the chosen data analysis technique appropriate in relation to the overall research question and the data abstracted?
- Is the analysis process properly described and transparent?

Phase 4: structuring and writing the review

- Is the review article organized coherently in relation to the overall approach and research question?
 - Is the overall method of conducting the literature review sufficiently described? Can the study be replicated?
 - Is the result of the review reported in an appropriate and clear way?
 - Does the article synthesize the findings of the literature review into a clear and valuable contribution to the topic?
 - Are questions or directions for further research included? Are the results from the review useable?
-

Figure 9 - Guidelines for conducting a literature review

(Snyder, 2019, p.335)

Examples of existing guidelines for conducting a literature review.

Authors	Discipline	Type of literature review	Contribution
Baumeister and Leary (1997)	Psychology	Narrative review	<ul style="list-style-type: none"> ● Overviews reasons for conducting a review ● Discusses common mistakes for conducting a review
Tranfield et al. (2003)	Management	Systematic review	<ul style="list-style-type: none"> ● Compares management and healthcare research ● Highlights the challenges of conducting a systematic review in management research ● Provides guidelines for conducting a systematic literature review in management research
Torraco (2005)	Human Resources	Integrative review	<ul style="list-style-type: none"> ● Defines the integrative literature review ● Provides guidelines and examples for integrative literature reviews ● Discusses contributions of an integrative literature review
Liberati et al. (2009)	Medicine	Systematic review and meta-analysis	<ul style="list-style-type: none"> ● Provides guidelines for conducting and reporting systematic reviews and meta-analysis
Wong et al. (2013)	Medicine	Semi-systematic review	<ul style="list-style-type: none"> ● Provides guidelines for conducting a meta-narrative review
Davis et al. (2014)	Social Sciences	Systematic review and meta-analysis	<ul style="list-style-type: none"> ● Synthesizes guidelines for systematic literature reviews ● Provides guidelines for conducting a systematic review and meta-analysis in social sciences
Palmatier et al. (2018)	Marketing	Review papers and systematic reviews	<ul style="list-style-type: none"> ● Provides guidelines for publishing review papers in the Journal of the Academy of Marketing Science

II Appendix B: Research materials used for research activities in Chapters Three, Four, Five and Six

Figure 10 - Ethical clearance document awarded by the School of Management



University Teaching and Research Ethics Committee

21 November 2018

Dear Tobias

Thank you for submitting your ethical application which was considered by the Ethics Committee when the following documents were reviewed:

1. Ethical Application Form
2. Participant Information Sheet
3. Consent Form
4. Debriefing Form
5. Semi-structured Interviews

The School of Management Ethics Committee has been delegated to act on behalf of the University Teaching and Research Ethics Committee (UTREC) and has granted this application ethical approval. The particulars relating to the approved project are as follows -

Approval Code:	MN13966	Approved on:	21/11/18	Approval Expiry:	21/11/23
Project Title:	Change management in the German automotive sector, challenges and strategies resulting from the electrification of the automotive industry and its products.				
Researcher(s):	Tobias Hein				
Supervisor(s):	Ruth Woodfield and Boyka Bratanova				

Approval is awarded for five years. Projects which have not commenced within two years of approval must be re-submitted for review by your School Ethics Committee. If you are unable to complete your research within the five year approval period, you are required to write to your School Ethics Committee Convener to request a discretionary extension of no greater than 6 months or to re-apply if directed to do so, and you should inform your School Ethics Committee when your project reaches completion.

If you make any changes to the project outlined in your approved ethical application form, you should inform your supervisor and seek advice on the ethical implications of those changes from the School Ethics Convener who may advise you to complete and submit an ethical amendment form for review.

Any adverse incident which occurs during the course of conducting your research must be reported immediately to the School Ethics Committee who will advise you on the appropriate action to be taken.

Approval is given on the understanding that you conduct your research as outlined in your application and in compliance with UTREC Guidelines and Policies (<http://www.st-andrews.ac.uk/utrec/guidelinespolicies/>). You are also advised to ensure that you procure and handle your research data within the provisions of the Data Provision Act 1998 and in accordance with any conditions of funding incumbent upon you.

Yours sincerely

Convener of the School Ethics Committee
cc Supervisor

School of Management Ethics Committee, The Gateway, North Haugh, St Andrews, Fife, KY16 9SS
management.ethics@st-andrews.ac.uk

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Figure 11 - Translated interview guideline questions for semi-structured interviews / manager interviews:

Semi-structured interview:

Guideline questions for manager interviews

First section: Employee behaviour and change communication

4. Have you ever experienced employees openly resisting internal changes proposed by the management?
5. Have you ever experienced employees openly resisting internal changes regarding electrification or pro-environmental changes proposed by the management? Can you tell me more about it?
6. If you have seen this, what is your understanding of employees resisting (electrification / pro-environmental changes) changes, what are their motivations?
7. What factors from the company side do you think can provoke such behaviour of resistance? (Poor planning or communication can provoke employees to resist changes)?
8. Do you believe currently that some employees are more likely to resist change than others? If so, why is that the case?
9. What is currently the fundamental difference between the employees' tasks, nature or backgrounds who resist change in comparison to those who embrace it?
10. Would you say that your behaviour as a manager directly influences the employee's mindset towards electrification (and other changes)?
11. If you reflect on your perception of change management: do you believe that you as a manager have different expectations, perceptions or ideas about current internal changes than your employees?

Second section: Change communication

- What is the most important characteristic in communication to enhance the employees' motivation?

- Imagine you had to start a change process targeting the whole electrification of your products, tomorrow morning at 8.00 o'clock, how would you start communicating today?
- Do you think there is a direct link between a two-way communication (feed-back culture) and the employees' happiness with the situation?
- What communication channels that are available in this company, do you think are the most suitable ones to convey a powerful message regarding electrification? Widest range?
- What communication channel do you think is the preferred one on behalf of the employees in times like this?
- Using Web 2.0 communication channels, like internal twitter like services, video blogs, team rooms, project blogs, corporate wikis: Do you think there would be a bigger potential to reach more employees at the same time to
- Can you tell me about a time when you feel change plans regarding pro-environmental changes were communicated well?
- Can you tell me about a time when you feel change plans regarding pro-environmental changes were communicated poorly?

Third section: Employee motivation and encouragement of pro-environmental behaviour

- What do you think is a better motivator for employees to change: monetary incentives and public recognition or personal and intrinsic motivation in form of setting personal and achievable (environmental) goals?
- If we decide that goal setting is a very effective way of motivating employees, how would you encourage your employees to set (realistic and reachable) goals for themselves?
- Is it irrational to believe that that the current company's goals can comply with the employees' goals?

Fourth section: Encouraging pro-environmental behaviour

- Do you believe that this concept has the power to encourage employees to commit to changes, and are you convinced by this approach?
- Could you imagine that employees would be more likely to commit to changes because they are of pro-environmental nature compared to changes that are not?

- If so, how would you, with your knowledge encourage employees to commit to these changes that have a positive impact on our planet?
- Different departments have different perceptions: Just follow the assumption that e.g. engineers are more aware of a product's environmentally impact than an employee in marketing.
 1. Have you ever realized a different in employee's perceptions towards this issue?
 2. Would you communicate pro-environmental changes differently to different departments?
- In your experience: Are employees aware that their job nowadays has a direct impact on their children's' and grandchildren's' future and that these rely on changes we make today? Or do employees consider their work as something that has to be done to bring food on the table today?

Fifth section: Targeted communication regarding electrification

- Do you have the perception using certain communication channels make the message 'stick' with the participants?
- Would you think that in change communication, eager phrased messages are more effective?
- Would you think that in change communication, persuasive phrased messages are more effective?
- Would you describe your employees as a group that likes to embrace new challenges or as a rather static group that likes to preserve the status quo?
- If there are both groups within the body of your employees, would you address them differently?

Figure 12- Translated interview guideline questions for semi-structured interviews / employee interviews:

Semi-structured interview:

Guideline questions for employee interviews

First section: Employee behaviour and change communication

12. Have you ever openly resisted internal changes proposed by the management regarding electrification? Why / Why not?
13. Have you ever experienced colleagues openly resisting internal changes regarding electrification or pro-environmental changes proposed by the management? Can you tell me more about it?
14. If you have seen this, what is your understanding of colleagues resisting (electrification / pro-environmental changes) changes, what are their motivations?
15. What factors from the company side do you think can provoke such behaviour of resistance? (Poor planning or communication?)
16. Do you believe currently that some employees are more likely to resist change than others? If so, why is that the case?
17. What is currently the fundamental difference between the employees' tasks, nature or backgrounds who resist change in comparison to those who embrace it?
18. Would you say that your managers' behaviour directly influences your mindset towards electrification (and other changes)?
19. If you reflect on your perception of change management: do you believe that you as an employee have different expectations, perceptions or ideas about current internal changes than your managers?

Second section: Change communication

- What is the most important characteristic in communication to enhance your motivation?
- Imagine you had to start a change process targeting the whole electrification of your products, tomorrow morning at 8.00 o'clock, how would you start communicating today?
- Do you think there is a direct link between a two-way communication (feed-back culture) and the your happiness with the situation?

- What communication channels that are available in this company, do you think are the most suitable ones to convey a powerful message regarding electrification? Widest range?
- What communication channel do you think is the preferred one on behalf of you and your colleagues in times like this?
- Using Web 2.0 communication channels, like internal twitter like services, video blogs, team rooms, project blogs, corporate wikis: Do you think there would be a bigger potential to reach more employees at the same time to
- Can you tell me about a time when you feel change plans regarding pro-environmental changes were communicated well?
- Can you tell me about a time when you feel change plans regarding pro-environmental changes were communicated poorly?

Third section: Employee motivation and encouragement of pro-environmental behaviour

- What do you think is a better motivator for you to change: monetary incentives and public recognition or personal and intrinsic motivation in form of setting personal and achievable (environmental) goals?
- If we decide that goal setting is a very effective way of motivating employees, how would you encourage your yourself and colleagues to set (realistic and reachable) goals for themselves?
- Is it irrational to believe that that the current company's goals can comply with the your own goals?

Fourth section: Encouraging pro-environmental behaviour

- Do you believe that this concept has the power to encourage employees to commit to changes, and are you convinced by this approach?
- Could you imagine that you would be more likely to commit to changes because they are of pro-environmental nature compared to changes that are not?
- If so, how would you, with your knowledge encourage yourself and other employees to commit to these changes that have a positive impact on our planet?
- Different departments have different perceptions: Just follow the assumption that e.g. engineers are more aware of a product's environmentally impact than an employee in marketing.

- 1 Have you ever realized a different in perceptions towards this issue?
 - 2 Would you communicate pro-environmental changes differently to different departments?
- In your experience: How do you perceive your job nowadays? Are you aware that current jobs have a direct impact on your children's' and grandchildren's' future and that these rely on changes we make today? Or do you consider your work as something that has to be done to bring food on the table today?

Fifth section: Targeted communication regarding electrification

- Do you have the perception using certain communication channels make the message 'stick' with the participants?
- Would you think that in change communication, eager phrased messages are more effective?
- Would you think that in change communication, persuasive phrased messages are more effective?
- Would you describe the employee group as a group that likes to embrace new challenges or as a rather static group that likes to preserve the status quo?
- If there are both groups within the body of your employees, would you address them differently?

Figure 13 - Letter of intent addressed to automotive companies

Betreff: Anfrage zur Mitarbeit eines Forschungsprojekt

Sehr geehrte Damen und Herren, mein Name ist Tobias Hein. Ich promoviere im Fachbereich Change Management an der School of Management der Universität St Andrews in Schottland bei Frau Prof. Dr. Ruth Woodfield (1. Gutachterin) und Herr Dr. Jeffrey Hughes (2. Gutachterin). Wie schon mit Frau X besprochen, ermöglicht mir die Firma XXXX einen Zugang in das Unternehmen, um einen Teil meiner Forschungsarbeit betreiben zu können.

Der vorläufige Titel meiner Arbeit lautet: **Change management in the German automotive sector, challenges and strategies resulting from the electrification of the automotive industry and its products.**

Ich suche interessierte Führungskräfte und Personen in Schlüsselpositionen, die an meinem Forschungsprojekt teilhaben wollen. Deshalb bitte ich Sie um Ihre Teilnahme an einem „in-depth“ Interview, welches ungefähr 45 Minuten bis zu einer Stunde dauern wird. Gegenstand des Interviews wird vor allem die Elektrifizierung der Automobilbranche und deren Produkte sein. Mit der Interviewmethode wird das Ziel verfolgt, von Personen, die unsere Wirtschaft im Süden Deutschlands mitgestalten, zu erfahren, wie große Veränderungen in Unternehmen am effektivsten an die Mitarbeiter zu kommunizieren sind und wie diese für Veränderungen motiviert werden können.

Sollten Sie sich zur Teilnahme entschließen, dann haben sie die Möglichkeit, an der Beantwortung der folgenden Forschungsfragen mitzuarbeiten:

- Wie müssen innerbetriebliche Veränderungen in Bezug auf die Elektrifizierung und E-Mobilität bestmöglich kommuniziert werden?
- Wie müssen unterschiedliche Mitarbeitergruppen adressiert werden um die Kommunikation während Veränderungsprozessen so effektiv wie möglich zu gestalten?

- Was ist die effektivste Art und Weise Mitarbeiter für Veränderungen zu motivieren um deren Zufriedenheit und Gesundheit zu gewährleisten?
- Welche Rolle spielen konventionelle sozialpsychologische Modelle bei der Kommunikation von Veränderungen in Unternehmen?

Eine detaillierte Beschreibung der Interviewmethode und den Inhalten finden Sie im beigefügten Handout.

Über eine Einladung zu einem Interview mit Ihnen würde ich mich sehr freuen. Wenn Sie vorab mehr Auskünfte über mein Forschungsvorhaben bzw. über meine Person haben möchten, stehe ich Ihnen jederzeit gerne zur Verfügung.

Für Ihre Unterstützung bedanke ich mich schon einmal im Voraus.

Mit freundlichen Grüßen,

Tobias Hein

Email: tobi.hein@me.com

Tel. +491722941188

Figure 14 - Company participant information sheet



Participant Information Sheet

Project Title

Change management in the German automotive sector, challenges and strategies resulting from the electrification of the automotive industry and its products.

What is the study about?

We invite you to participate in a research project about change communication and change strategies. The main aim of this study is to obtain an understanding of what the most effective way is to communicate changes containing the electrification of products in automotive companies in South-West Germany. Interviews with 10 persons in executive positions will be undertaken and 30 interviews with employees are planned. This will enable the researcher to use an interview focus which takes a managerial- and an employee- perspective into consideration which enables the researcher to derive the planned change communication strategies from the executives and the expectations of those strategies on behalf of the employees.

This study is being conducted as part of my, Tobias Hein, PhD Thesis in the School of Management.

Do I have to take Part?

This information sheet has been written to help you decide if you would like to take part. It is up to you and you alone whether or not to take part. If you do decide to take part, you will be

free to withdraw at any time without providing a reason until the thesis will be written up in May 2020.

What would I be required to do?

You will be asked to participate in an in-depth interview that we anticipate will take up a maximum of 60 minutes to complete. The information you provide will be held with the highest confidentiality by the researcher and supervisors involved in this project. Before agreeing to participate in this research you will be given a Participant Information Sheet that will further detail my research before consenting to participate.

Will my participation be Anonymous and Confidential?

The purpose of this section is to ensure that you are willing to take part in this study and to let you understand what it entails. Material gathered during this research will be coded to secure your data remains confidential. The collected data will be securely stored on a password saved, encrypted file on 'OneDrive', the University of St Andrews' security approved cloud system for up to and including 7 years before its professional destruction. Your permission maybe sought in the Participant Consent form for the data you provide, which will have all personal identifiers removed, so it cannot be traced back to you by anyone who reads the thesis. Only the researcher, who is obliged to keep all collected data confidential, is able to trace the data back to the participants of this study.

Storage and Destruction of Data Collected

Your data, namely transcriptions and recordings will be stored for future research, for up to and including 7 years in accordance with EU General Data Protection Regulation (GDPR). Material gathered during this research will be coded and kept confidential by the researcher. If after the thesis submission or publication of the thesis, other researchers want to have access to the coded data for research purposes, they have to contact the researcher of this study directly in order to get access to the data. However, it will not be possible for other academics, to make a

connection to you as a participant because all personal identifiers are removed from the coded data.

The collected data, namely recordings and transcripts will be saved on a password secured, encrypted file on 'OneDrive', the University of St Andrews' security approved cloud system, so all data is protected by the university's security measures. Furthermore, additionally to the password protection on the encrypted file, access to 'OneDrive' is also password secured by the outlook programme.

The signed participants' consent forms will be stored in a lockable cabinet, in a lockable room to which only the researcher has access to, separately from other collected materials (recordings and transcripts).

All collected data, including the signed participant consent forms will be stored for a period of up to and including 7 years, in order to demonstrate legislative compliance with the GDPR. Your data will be coded and kept confidential by the researcher. No personal information can be traced back to you at any time from the information provided in the thesis. Only the researcher will be able to trace collected data back to participants, however the researcher is obliged to keep this information strictly confidential.

After 7 years your data will be destroyed professionally, so the data confidentiality will be secured at all time during this 7-year period.

What will happen to the results of the research study?

The results will be finalised approximately by the end of 2020 and written up as part of my PhD Thesis. If you wish to withdraw from the study, you can do so without naming any reasons until the thesis will be written up, starting in May 2020. Material gathered during this research will be coded and kept confidential by the researcher. If after the thesis submission or publication of the thesis, other researchers want to have access to the coded data for research purposes, they have to contact the researcher of this study directly in order to get access to the data. However, it will not be possible for other academics, to make a connection to you as a participant because all personal identifiers are removed from the coded data.

Questions

You will have the opportunity to ask any questions in relation to this project before giving completing a Consent Form.

Consent and Approval

This research proposal has been scrutinised and been granted Ethical Approval through the University ethical approval process.

What should I do if I have concerns about this study?

A full outline of the procedures governed by the University Teaching and Research Ethical Committee is available at <http://www.st-andrews.ac.uk/utrec/guidelinespolicies/complaints/>

Contact Details

Researcher: Tobias Hein

Contact Details: tmh6@st-andrews.ac.uk

0049172294118

Supervisor: Ruth Woodfield; Jeffrey Hughes

Contact Details: Ruth Woodfield: rw57@st-andrews.ac.uk

Jeffrey Hughes: jh312@st-andrews.ac.uk

Figure 15 - Participant Consent Form Coded Data



Participant Consent Form Coded Data

Project Title

Change management in the German automotive sector, challenges and strategies resulting from the electrification of the automotive industry and its products.

Researcher's Name

Tobias Hein
University of St Andrews
tmh6@st-andrews.ac.uk

Supervisors Names

Dr. Ruth Woodfield
Dr. Jeffrey Hughes

The University of St Andrews attaches high priority to the ethical conduct of research. We therefore ask you to consider the following points before signing this form. Your signature confirms that you are happy to participate in the study.

What is Coded Data?

The term 'Coded Data' refers to data collected by the researcher which is identifiable as belonging to a particular participant but is kept with personal identifiers removed. The researcher retains a 'key' to the coded data which allows individual participants to be re-connected with their data at a later date (only by the researcher!). The un-coded data is kept confidential to the researcher. If consent is given to archive data (see consent section of form) the participant may be contacted in the future by the original researcher or other researcher.

Consent

The purpose of this form is to ensure that you are willing to take part in this study and to let you understand what it entails. Signing this form does not commit you to anything you do not wish to do, and you are free to withdraw at any stage. The thesis will be started to be written up in May 2020 until then you as a participant can withdraw at any time without giving any reasons why.

Your data, namely transcriptions and recordings will be stored for future research, for up to and including 7 years in accordance with EU General Data Protection Regulation (GDPR). Material gathered during this research will be coded and kept confidential by the researcher. If after the thesis submission or publication of the thesis, other researchers want to have access to the coded data for research purposes, they have to contact the researcher of this study directly in order to get access to the data. However, it will not be possible for other academics, to make a connection to you as a participant because all personal identifiers are removed from the coded data.

The collected data, namely recordings and transcripts will be saved on a password secured, encrypted file on 'OneDrive', the University of St Andrews' security approved cloud system, so all data is protected by the university's security measures. Furthermore, additionally to the password protection on the encrypted file, access to 'OneDrive' is also password secured by the outlook programme.

The signed participants' consent forms will be stored in a lockable cabinet, in a lockable room to which only the researcher has access to, separately from other collected materials (recordings and transcripts).

All collected data, including the signed participant consent forms will be stored for a period of up to and including 7 years, in order to demonstrate legislative compliance with the GDPR. Your data will be coded and kept confidential by the researcher. No personal information can be traced back to you at any time from the information provided in the thesis. Only the researcher will be able to trace collected data back to participants, however the researcher is obliged to keep this information strictly confidential.

After 7 years your data will be destroyed professionally, so the data confidentiality will be secured at all time during this 7-year period.

Please answer each statement concerning the collection and use of the research data.

- | | | |
|--|-----|----|
| I have read and understood the information sheet. | Yes | No |
| I have been given the opportunity to ask questions about the study. | Yes | No |
| I have had my questions answered satisfactorily. | Yes | No |
| I understand that I can withdraw from the study at any time without having to give an explanation until May 2020. | Yes | No |
| I understand that my data will be confidential and that it will contain identifiable personal data but that will be stored with personal identifiers removed by the researcher and that only the researcher will be able to decode this information as and when necessary. | Yes | No |
| I understand that my data will be stored for up to and including 7 years for future research | Yes | No |

Part of my research involves taking tape recordings. These recordings will be kept secure and stored with no identifying factors i.e. consent forms and questionnaires.

Photographs and recorded data can be valuable resources for future studies therefore we ask for your additional consent to maintain data and images for this purpose.

- | | | |
|---|------------------------------|-----------------------------|
| I agree to being tape recorded | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I agree for tape recorded material to be published as part of this research | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I agree for my tape-recorded material to be used in future studies | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Participation in this research is completely voluntary and your consent is required before you can participate in this research. If you decide at a later date that data should be destroyed, we will honour your request in writing.

Name in Block

Capitals

Signature

Date

Figure 16- Participant Debriefing Form



Participant Debriefing Form

Project Title

Change management in the German automotive sector, challenges and strategies resulting from the electrification of the automotive industry and its products.

Researcher(s) Name(s)

Tobias Hein

Tmh6@st-andrews.ac.uk

Supervisor's Name

Dr. Ruth Woodfield

Dr. Jeffrey Hughes

Nature of Project

This research is a project about change communication and change strategies. The main aim of this study is to obtain an understanding of what the most effective way is to communicate changes containing the electrification of products in automotive companies in South-West Germany. Interviews with 10 persons in executive positions will be undertaken and 30 interviews with employees are planned. This will enable the researcher to use an interview focus which takes a managerial- and an employee- perspective into consideration which enables the researcher to derive the planned change communication strategies from the executives and the expectations of those strategies on behalf of the employees.

This study will not use any form of deception at any time!

Storage of Data

Your data, namely transcriptions and recordings will be stored for future research, for up to and including 7 years in accordance with EU General Data Protection Regulation (GDPR). Material

gathered during this research will be coded and kept confidential by the researcher. If after the thesis submission or publication of the thesis, other researchers want to have access to the coded data for research purposes, they have to contact the researcher of this study directly in order to get access to the data. However, it will not be possible for other academics, to make a connection to you as a participant because all personal identifiers are removed from the coded data.

The collected data, namely recordings and transcripts will be saved on a password secured, encrypted file on 'OneDrive', the University of St Andrews' security approved cloud system, so all data is protected by the university's security measures. Furthermore, additionally to the password protection on the encrypted file, access to 'OneDrive' is also password secured by the outlook programme.

The signed participants' consent forms will be stored in a lockable cabinet, in a lockable room to which only the researcher has access to, separately from other collected materials (recordings and transcripts).

All collected data, including the signed participant consent forms will be stored for a period of up to and including 7 years, in order to demonstrate legislative compliance with the GDPR. Your data will be coded and kept confidential by the researcher. No personal information can be traced back to you at any time from the information provided in the thesis. Only the researcher will be able to trace collected data back to participants, however the researcher is obliged to keep this information strictly confidential.

After 7 years your data will be destroyed professionally, so the data confidentiality will be secured at all time during this 7-year period.

You can withdraw from this study at any time without giving an explanation until the thesis will be written up in May 2020.

Help Organisations

If you have been affected by participation in this study and wish to discuss your concerns further, you may wish to contact;

The university of St Andrews:

management.school@st-andrews.ac.uk

The study supervisors:

Contact details can be found on the bottom of this page.

Work union (IG Metall):

internet@igmetall.de

069 / 6693-0

Federal Agency for Work (Bundesagentur für Arbeit):

Zentrale.JDC-Datenschutz@arbeitsagentur.de

0911 179-7805

Ministry of Labor and Social Affairs (BMAS):

info@bmas.bund.de

What should I do if I have concerns about this study?

A full outline of the procedures governed by the University Teaching and Research Ethical Committee are outline on their website - <http://www.st-andrews.ac.uk/utrec/guidelinespolicies/complaints/>

Contact Details

Researcher: Tobias Hein

Contact Details: tmh6@st-andrews.ac.uk

00491722941188

Supervisor: Ruth Woodfield; Jeffrey Hughes

Contact Details: Ruth Woodfield: rw57@st-andrews.ac.uk

Jeffrey Hughes: jh312@st-andrews.ac.uk

Figure 17 - List of participants numerically listed in NVivo

E1 Company B	1	34	14.03.2020, 17:00	TMH	Heute, 15:54	TMH
E10 Company B	1	239	21.03.2020, 10:18	TMH	Heute, 15:54	TMH
E11 Company B	1	29	21.03.2020, 11:12	TMH	Heute, 15:54	TMH
E12 Company B	1	90	21.03.2020, 11:22	TMH	Heute, 15:54	TMH
E13 Company C	1	173	21.03.2020, 18:44	TMH	Heute, 15:54	TMH
E14 Company C	1	54	22.03.2020, 16:46	TMH	Heute, 15:54	TMH
E15 Company C	1	203	22.03.2020, 16:58	TMH	Heute, 15:54	TMH
E16 Company C	1	53	22.03.2020, 17:34	TMH	Heute, 15:54	TMH
E17 Company C	1	41	22.03.2020, 18:01	TMH	Heute, 15:54	TMH
E18 Company C	1	62	22.03.2020, 18:26	TMH	Heute, 15:54	TMH
E19 Company B	1	45	30.03.2020, 20:55	TMH	Heute, 15:54	TMH
E2 Company B	1	36	14.03.2020, 17:09	TMH	Heute, 15:54	TMH
E3 Company B	1	22	14.03.2020, 17:17	TMH	Heute, 15:54	TMH
E4 Company B	1	29	14.03.2020, 17:28	TMH	Heute, 15:54	TMH
E5 Company B	1	33	14.03.2020, 17:33	TMH	Heute, 15:54	TMH
E6 Company B	1	129	18.03.2020, 09:51	TMH	Heute, 15:54	TMH
E7 Company B	1	130	18.03.2020, 10:05	TMH	Heute, 15:54	TMH
E8 Company B	1	114	21.03.2020, 09:35	TMH	Heute, 15:54	TMH
E9 Company B	1	131	21.03.2020, 10:01	TMH	Heute, 15:54	TMH
M1 Company A	1	42	12.03.2020, 15:11	TMH	Heute, 15:54	TMH
M10 Company B	1	25	13.03.2020, 16:16	TMH	Heute, 15:54	TMH
M11 Company B	1	123	13.03.2020, 16:22	TMH	Heute, 15:54	TMH
M12 Company E	1	32	14.03.2020, 16:02	TMH	Heute, 15:54	TMH
M13 Company D	1	22	14.03.2020, 16:12	TMH	Heute, 15:54	TMH
M14 Company F	1	65	14.03.2020, 16:15	TMH	Heute, 15:54	TMH
M15 Company B	1	157	14.03.2020, 16:25	TMH	Heute, 15:54	TMH
M16 Company D	1	143	14.03.2020, 16:43	TMH	Heute, 15:54	TMH
M17 Company C	1	21	21.03.2020, 11:39	TMH	Heute, 15:54	TMH
M18 Company C	1	167	21.03.2020, 11:50	TMH	Heute, 15:54	TMH
M19 Company C	1	25	21.03.2020, 17:46	TMH	Heute, 15:54	TMH
M2 Company A	1	41	12.03.2020, 15:49	TMH	Heute, 15:54	TMH
M20 Company C	1	26	21.03.2020, 17:46	TMH	Heute, 15:54	TMH
M21 Company C	1	22	21.03.2020, 18:25	TMH	Heute, 15:54	TMH
M22 Company C	1	129	21.03.2020, 18:29	TMH	Heute, 15:54	TMH
M3 Company A	1	80	12.03.2020, 15:54	TMH	Heute, 15:54	TMH
M4 Company A	1	73	12.03.2020, 16:05	TMH	Heute, 15:54	TMH
M5 Company A	1	87	12.03.2020, 16:17	TMH	Heute, 15:54	TMH
M6 Company A	1	136	12.03.2020, 16:48	TMH	Heute, 15:54	TMH
M7 Company A	1	86	12.03.2020, 17:00	TMH	Heute, 15:54	TMH
M8 Company A	1	50	13.03.2020, 15:42	TMH	Heute, 15:54	TMH
M9 Company A	1	105	13.03.2020, 15:56	TMH	Heute, 15:54	TMH

Figure 18 - Coding list – Alphabetical derived from initial NVivo analysis

Name	Beschreibung	Datei	Referenzen
Agile Transformation		6	13
Agile Arbeitsweisen		8	16
Agile Arbeitsweisen Nachteile		12	24
Agile Arbeitsweisen vorteile		7	13
Agile Transformation and Age		2	4
Communication to different departments		5	6
Forced openness		2	3
Kommunikation Agile Transformation		12	22
Kommunikationsgeschwindigkeit Agile		8	13
Projects Agile Transformation		4	4
Wahrnehmung von Agile Transformation		16	34
Change Communication		0	0
Age and Communication Channels		6	9
Best perceived communication channel by employees		25	53
Betriebsversammlungen (Town Hall)		26	44
Case-Bad Change Communication		27	76
Case-Good Change Communication		30	67
CEO Communication		3	8

Name	Beschreibung	Datei	Referenzen
Change agents		7	11
Change communication in Hierarchical organisations		13	33
Communicating Changes		37	163
Communication Channels		34	93
Communication Strategy		1	2
Complexity of Communication Content		4	7
Employee exchange		6	6
Favourite Communication Channel (Managers)		4	7
Flurfunk		11	16
Information Communication		11	19
Leadership Communication		25	59
Meetings (Team-Meetings)		14	18
Presentations		10	19
Printed Communication		7	11
Problems Change Communication		7	16
Schwierigkeit, Konzernübergreifender Kommunikation		7	20
Sensemaking		7	13
Story Telling		1	2
Strategy Change Communication		19	52
Verbal or Direct Communication (Face-to-Face)		30	90
Wahrnehmung von Kommunikation		7	9

Name	Beschreibung	Datei	Referenzen
WEB 2.0 Communication Channels		35	141
Wissensstand Dcrepancies		1	3
Worst perceived communication channel by employees		2	4
Written Communication (Email)		23	47
Communicative style		2	2
Channels		8	33
Message Content		7	15
Message Tone		4	6
Employee Motivation		0	0
Advantages Goal Setting		4	6
Communicating Goals		20	29
Company culture and motivation		6	11
Employee Loyalty		4	4
Extrinsic Motivation		19	40
Goal setting and change		7	8
Goals and rewards		6	7
Intrinsic motivation		15	23
Leadership Motivation		20	46
Money is important		15	26
Money is unimportant		16	22
Motivating Employees		31	90
Motivation to change		3	5
Perception Goal Setting		36	111
Persönliche employee goals		4	5
Problems with Goal Setting		23	37
Recruiting motivated people		4	5

Name	Beschreibung	Datei	Referenzen
Reflection of employees about goals		7	11
Setting goals for employees		10	18
Tasks motivate employees		10	14
Teilhaben lassen am Produkt		7	17
Ziele als Motivation		7	10
Zielkonflikte		10	17
Zielsetzung und Gewerkschaften		1	1
Zielvereinbarkeit von employees und Unternehmen		24	52
Interesting Side Topics		0	0
Burnout		1	1
Changes und Gesundheit		2	26
Digitalisierung		2	2
Fehlerkultur		2	3
Handling Employee Expectations		1	1
Interesting Side-Notes		5	13
Lieferratenregress		1	2
Other Change Examples		3	5
Prozesssteuerung während Changes		2	2
Schlechtes Führungsverhalten		1	2
PEB, Electrification		2	2
Advantages Electrification		11	15
Age and PEB		2	3
Battery Production and Technology		12	27
Beeinflussung von PEB auf den Job		11	24

Name	Beschreibung	Datei	Referenzen
Change des Arbeitsplatzes durch PEB		12	36
Communicating PEB to non technological jobs		14	30
Communicating PEB to Technological Jobs		14	22
Communication of Pro-Environmental behaviour		37	145
Electricity Production (Infrastructure)		5	10
Encouragement of Pro-Environmental behaviour		25	70
Job and PEB		6	8
Motivation for PEB (Technology)		11	21
Outside Pressure (Politics, Society)		22	65
PEB (Electrification) as a Threat		8	24
PEB als chance		11	14
PEB impact on employees		15	65
PEB in foreign countries		11	21
PEB in Transportation		5	13
PEB Motivation		28	92
PEB outside of the Company		15	25
PEB Strategy		27	127
Perception Electrification		11	70
Perception of PEB to Conventional change		10	19
Perception of pro-environmental measures		38	255
Pro-Environmental Goals		4	13

Name	Beschreibung	Datei	Referenzen
Problems Electrification		25	138
Problems PEB		7	19
Projects in PEB		11	18
Trust in Company		10	23
Perception and Reaction to changes		1	1
Age and Resistance		14	20
Asking questions as manifestation of resistance		5	7
Change Befürworter Characteristics		18	28
Change Gegner Characteristics		24	46
Comfort Zone		4	5
Culture and resistance		5	16
Differences between resisting and accepting to change		15	37
Employee perception of changes		14	35
Environment for Resistance		14	30
Erwartungshaltung und change		6	8
Fear		11	15
Frustration der Mitarbeiter		3	5
Führungsverhalten und resistance		10	35
General employee behaviour during change		20	40
Identifying Resistance		2	6
Job and Resistance		8	15
Motivation for resistance		15	19
Overcoming Resistance		25	106
Peer Pressure		2	2
Provoking Resistance		27	62

Name	Beschreibung	Datei	Referenzen
Reactions to changes (Resistance, Acceptance)		34	143
Resistance of Managers		6	10
Resistance, Digitalisation		4	4
Time to manifest changes		1	1
Targeted Communication		0	0
Addressing different groups of employees		19	76
Addressing prevention focus		12	40
Addressing promotion focus		7	12
Advantages Targeted Communication		1	1
Communication in Focus scenarios		7	13
Departments with different focuses		3	3
Disadvantages Targeted Communication		4	5
Leadership and focus communication		6	10
Prevention focus Characteristics		11	16
Prevention of Managers		2	6
Problems of Targeted Communication		10	14
Promotion Focus Characteristics		6	9
Recognizing different focuses		5	11
Recruiting and focuses		7	12
Separating Employees by focus		9	12
Solving focus discrepancies		11	26

Name	Beschreibung	Datei	Referenzen
Targeted Communication Strategies		6	9
Two-Way Communication		0	0
Channels for feedback		7	10
Channels that limit two-way communication		7	9
Difficulties of two-way Communication		10	24
Employee satisfaction and two-way communication		12	13
Environments for two-way communication		18	45
Feed-Back and two-way Communication		29	78
Good Channels for Feedback		4	4
How do employees give feedback		4	7
Leadership and two-way communication		12	34
Open-Door		2	3
Possibilities to give feedback		6	8
Vorgesetzten-Bewertung		5	8

Figure 19- Impact of COVID-19 on the research activity

Since the outbreak of the COVID-19 pandemic in late 2019 and early 2020 in Europe, many researchers and PhD students have been affected adversely by the events that have unfolded with the spread of the coronavirus across the globe. The data collection of this thesis finished in February 2020, at a time when there were no restrictions and everyone was still able to move freely and meet people, even though the coronavirus was already present in Europe. If more interviews would have been scheduled after February 2020, the collection of more qualitative data would have been very difficult. In April 2020 all German automotive companies entered a government short-working scheme which enabled the companies to pay their staff through state subsidies, although no employees had to work. This was a policy to fight the effects of COVID-19 in Germany.

Moreover, supervision has focused upon the issue of how this thesis should address the possible effects of COVID-19 on internal communication since this pandemic has now shown that, for instance, FaceTime, Skype and Zoom are viable communication channels for companies whose employees work from home. It was ultimately decided not to address COVID-19 in this thesis because, hopefully, in the near future companies can go back to offering their employees the work environments they are accustomed to, in which face-to-face and group meetings are normal again. Certainly COVID-19 has shown that the increased use of Information Communication Technology (ICT) has helped companies to communicate with their employees working from home. As a great number of employees have learned to appreciate this new working situation, COVID-19 seems to have taken away from companies the option to communicate with their staff using all their channels. Especially when conveying internal change messages, however, using all or at least many media channels has proven to be a communication strategy that is indispensable.

Figure 20- Reflecting on the chosen research topic and approach

Having worked in the automotive industry before, there was always an interest in conducting a study in this industry. At the beginning of the PhD programme in the academic year 2017/2018, a research proposal was created that aimed to identify possible communication practices between men and women in automotive companies and how these communication practices in departments where women were underrepresented like R+D and other engineering departments differed from those in departments such as Marketing and HR where men were underrepresented.

However, in late 2017 and early 2018, a shift in Germany's political decision-making regarding green mobility required the automotive industry to change significantly, as automotive companies were required to increase production of electrified engines and other emission-free drivetrains. After contact was made with all three companies to negotiate access for the initial research proposal, both parties realised that the automotive industry was concerned with more pressing questions. After the researcher was convinced that more pressing and topical issues could be observed in the automotive industry, the research focus shifted towards electrification. Ultimately, the decision was taken to research electrification as a change based on first-hand impression, since it was happening in the automotive industry at the time when the research process began. Having a background in business communication and sociology, the researcher realised that this was an excellent opportunity to explore a new change in an industry well known to him. A positive effect that resulted from this subject change was the sudden increased interest of the company contact persons, who were very enthusiastic about the topic and helped the researcher to gain access to their companies and to conduct research there.

After proposing the new study topic, which aimed to research the perception and communication of electrification, to Company Albert, Company Bertha and Company Carl, the nature and extent of company access was discussed with representatives of each company. Company Albert's contact person offered the researcher a contract that dictated that whatever the study's findings were, they could only and exclusively be presented to Company Albert and no other companies. Furthermore, if Company Albert's offer was accepted, all options to publish this thesis' findings would have been lost. Therefore, this offer was declined, and it was explained to the company that such a contract would possibly prevent this thesis from being unbiased and would limit the possibilities to gain access to Company Bertha and Company Carl. Company Albert understood this standpoint, but their internal policies limited this

research; the researcher could only interview managers since only internal research requests could be presented to the work council. Therefore, as presented in Chapter Four, no employee interviews were conducted at Company Albert. Company Bertha and Company Carl were more supportive, as they did not have such strict regulations denying researchers or third parties with an appropriate background access to their sites for the purpose of interviewing employees; they allowed the researcher to access their premises to interview managers and employees on site. In order to overcome the missing employee group of Company A, managers of this company were asked how they would imagine their employees would perceive electrification and its communication. While the managers answered these questions, their answers could not make up for the lack of the employee group since the managers' answers were potentially value-loaded and not representative of their employees' views.

All interviews were held at the companies' sites, and no participants were interviewed at their homes or elsewhere. Moreover, the interviews were conducted in meeting rooms, meaning that the participants could talk openly and freely without fear that their co-workers could hear them. During the interviewing phase, the only problems and challenges that occurred were that many participants had short-term business trips or important meetings scheduled on days on which they initially had agreed to be interviewed. In general, however, all interviews went smoothly and took place in a relaxed and comfortable environment.