Master's Thesis

The systemic influences to greenwashing events

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The systemic influences to greenwashing events

by

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Executive Summary

Greenwashing refers to the dissemination of misleading information or even outright lies by an organization about the environmental benefits their products bring, services offered, or the practices the organisation follows. It has grown to build up as one of the most critical challenges facing businesses today. The focus of this current thesis is on greenwashing as a systemic problem, underlining interdependent factors that encourage its continuance in different sectors. This research will achieve this by applying Rasmussen's Accimap methodology to three high-profile cases related to corporate green crime: the Dieselgate emissions scandal at Volkswagen, misrepresentation of ESG at DWS, and the greenwashing lawsuit at Shell. The choice of these cases was based on their having enormous impacts within the respective sectors and being good examples of how greenwashing can have complicated and systemic dimensions.

It first sets greenwashing within the broader context of the green economy and underlines some of the potential contradictions and challenges. It is true that there is a growing global commitment to sustainability; greenwashing subverts this effort by allowing firms to exploit regulatory gaps and market demand for greening without having to do anything meaningful to change business operations. The research highlights that greenwashing is not an isolated practice but is, in fact, a symptom of deeper systemic issues—related to competitive pressures, inadequate regulatory frameworks, and misaligned corporate incentives—that are not aligned with genuine sustainability goals.

On the systemic factors that have led to the three case studies of greenwashing, this analysis goes in-depth. The Volkswagen Dieselgate scandal will be deconstructed as a case of how corporate governance failures aligned with regulatory shortcomings in order to allow the company to manipulate emission data and dupe regulators and consumers. In the case of DWS, it will be the greenwashing propensity of the financial sector, which concocted a very dangerous brew from the wish for profitable investments in ESG and weak supervision that led to gross misrepresentation. In the Shell case, it is seen that legal and social pressure interact in how these sometimes may challenge but inadvertently support greenwashing attempts if the corporate strategy places public relations at a higher level than more authentic forms of environmental stewardship.

In doing so, the research applies a meta-analysis across these cases using the Accimap methodology to map common systemic factors that contribute to greenwashing. With that analysis, several diachronic patterns have been identified, such as the use of regulatory loopholes, strategic manipulation of sustainability claims, and systemic misalignment between corporate practices and environmental goals. Results indicate that greenwashing is very entrenched within the structural and operational frameworks of industries, hence very persistent and hard to get rid of.

This conceptualization of greenwashing as a systemic failure within complex sociotechnical systems adds significant value to the academic literature. The research offers an entirely new approach to understanding how such practices can be facilitated by the interplay of different factors, using a Meta-Accimap methodology applied to greenwashing analysis. This systemic perspective given in the thesis not only enhances the understanding of greenwashing per se but also furnishes practice-relevant insights for regulators, policymakers, and industry practitioners. It puts on the table the need for a well-orchestrated effort to address its causes and not just its symptoms of greenwashing.

Through these methods, some key characteristics arise underlying the systemic character of greenwashing but also showcasing its dynamic nature. While it is concluded that managerial decisions are primarily influencing "greenwashing as a systemic symptom, it is also shown that it is the most influenced category. While the Meta-Accimap maps all causal relations it is pivotal to note that decisions made on all levels of the system facilitate greenwashing. As management can both be seen as a starting and an end point of these ripple effects, the responsibility falls on the entirety of the system to mitigate these leverage points. Regulatory audits and inspections emerge as the most influential nodes; unlike management, it is the policymakers and judicial bodies that are primarily responsible for addressing greenwashing. Ultimately, a coordinated effort across all levels of the system is necessary to effectively address and mitigate the systemic drivers of greenwashing.

This research has very wide-ranging implications, more so in the context of the prevailing global push toward sustainability. As greenwashing becomes sophisticated, so have strategies to counter it. The present thesis has provided a framework through which more innovative tools and strategies for detecting and mitigating greenwashing can be developed to ensure credible corporate environmental claims—hence, genuine and impactful sustainability efforts. This work ultimately contributes to the bigger goal of creating an open, transparent, and responsible business environment.

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Nomenclature

This Chapter includes a list of abbreviations and common terms used throughout the report, and a list of figures and tables.

Frequently Used Abbreviations & Terms

Abbreviations and Terms Used	Definition
CSR	Corporate Social Responsibility
SDG	Sustainable Development Goals
GDP	Gross Domestic Product
UN	United Nations
GEP	Green Economy Project
MNCs	Multinational corporations
SOEs	State-owned Enterprises
ESG	Environmental, Social, and Governance
WVU	West Virginia University
VW	Volkswagen AG
DB	Deutsche Bank
SEC	Securities and Exchange Commission

Chapter 1
Introduction

1.1. Research Motive

The rise of Climate Action has been a driving force behind the growing adoption of ESG principles, as companies and investors recognize the urgent need to address environmental challenges. Perhaps above all, climate action has been pressing hard, especially after international agreements such as the Paris Agreement, on businesses to bring down their carbon footprints and align with global goals of sustainability (on Climate Change (UNFCCC), 2015). This has led to an increased emphasis on ESG factors as companies seek to integrate environmental sustainability into their core operations. This has ushered an increased emphasis on ESG factors in the attempts of organizations towards embedding environmental sustainability into the mainstream of their businesses. The momentum generated by climate action has not only encouraged companies to adopt greener practices but has also attracted investors who are increasingly prioritizing ESG criteria in their decision-making processes (Eccles, Ioannou, & Serafeim, 2014). This shift has laid the groundwork for the expansion of the ESG landscape, as more and more companies strive to meet the standards set (Giese et al., 2019).

With the green economy growing, it unintentionally leaves room for ”greenwashing”, a practice in which companies exaggerate or falsify their environmental actions. The green economy activities are targeted toward reduced environmental risks and ecological scarcity in an attempt to attain sustainable development without degradation of the environment, thereby becoming an integral part of the economy globally (UNEP, 2011). However, the more rewarding and mainstream the green economy is, the more businesses find themselves wanting to participate—sometimes without due respect for sustainability commitment. This has resulted in more superficial or misleading claims about environmental benefits referred to as greenwashing (Lyon & Montgomery, 2015). This problem is further exacerbated by a lack of standardized measures and difficulties in verification related to environmental claims.

”The act of providing stakeholders with misleading or outright false information about the environmental impact of a company’s products and operations is considered greenwashing”

This practice, as defined by Hayes (2024), is not confined to any single sector but has become a pervasive issue across industries and is increasingly recognized as a systemic problem (Hayes, 2024; Mobiquity, 2021). For example, in the UK banking sector, greenwashing has been identified as a systemic issue, with executives often claiming that sustainability is integral to their business despite evidence suggesting otherwise (Mobiquity, 2021; Research, 2022). This problem extends beyond the financial sector, as Yang et al. (2020) illustrate through numerous cases of companies across various industries engaging in deceptive environmental marketing practices to enhance their public image. These practices are exacerbated by competitive pressures, regulatory gaps, and market opportunities, particularly in regions where environmental regulations are less stringent. Furthermore, Leonidou and Skarmeas (2015) note that the increasing prevalence of greenwashing not only misleads consumers but also undermines genuine sustainability efforts, leading to a rise in consumer cynicism and mistrust towards corporate environmental claims. Research indicates that this practice has become widespread, particularly in industries such as fashion, food, and energy, where the pressure to appear sustainable is especially high (Inc, 2010). This far-reaching character of greenwashing suggests that the issue is pervasive throughout the system and requires a holistic systems analysis to tackle and achieve genuine sustainability.

1.2. Study Background

The Identification of Greenwashing as a systems problem and the lack of literature in viewing it as a systemic consequence, position this research as a connection point between greenwashing risk management and environmental communication strategies. As such it is essential to understand the concepts of ”Green Economy” and ”Institutional Greenwashing” as well as prominent events that address the co-existence of the two.

1.2.1. Greenwashing is primarily a challenge for the Green Economy

The United Nations Environment Programme (UNEP) initiated the green economy project in June 2012 during Rio+20, unveiling their key document titled "Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication" (UNEP, 2011). This project is presented as an extensive reform initiative. Although the United Nations (UN) rhetoric implies a serious commitment to tackling the biodiversity crisis, green economists and numerous social movements remained sceptical about the suggested policy mechanisms.

At Rio+20, civil society reacted with numerous critical statements. They condemned what they perceived as the corporate capture of the UN Statement, 2012, criticized the "Natural Capital Declaration" (Banktrack, 2012), denounced 20 years of Greenwashing (Boehnert, 2016), and ultimately rejected the entire green economy project (Boehnert, 2016; Patel & Crook, 2012). Even back then the GEP was viewed with suspicion as it pertained to the privatization and commodification of natural capital by large financial institutions. Reconceptualizing natural commons as natural capital, which treats nonhuman nature as tradeable commodities, is a dangerous idea. It promotes ecological ignorance and prioritizes profit over real environmental protection, resulting in greenwashing where climate goals are met with superficial marketing instead of real action. This approach undermines genuine progress in combating climate change. Boehnert, 2016 argued, *"While market processes give the "impression that humankind can control nature as assets' so as to have the possibility to bail out' earth systems when they break down" (Fioramonti, 2013), once ecological thresholds are passed money cannot fix extinct species, collapsed ecosystems, climate change, etc. Financial valuation processes reward ignorance on issues of risk since knowledge and value have a corollary relationship, i.e. the higher the level of knowledge of the risks of ecologically damaging activity, the higher the value assigned to ecosystems in cost–benefit analysis (Adams, 1996)."*

The current landscape of the green economy is marked by a growing global commitment to sustainability, yet it is fraught with significant challenges and contradictions (Montgomery, Lyon, & Barg, 2023).

Hickel and Kallis, 2020 rigorously analyzed the feasibility of green growth, particularly the concept of absolute decoupling, which is essential for reducing resource use and carbon emissions while maintaining economic growth. Their study concludes that there is no empirical evidence supporting the possibility of absolute decoupling at a global scale, and that relative decoupling observed in high-income nations is insufficient to address the climate crisis. A study published by Pimonenko et al., 2020 underlines that interest in greenwashing increased in the period of the extension of SDGs (2012), as well as when banks started to allocate finance for green projects.

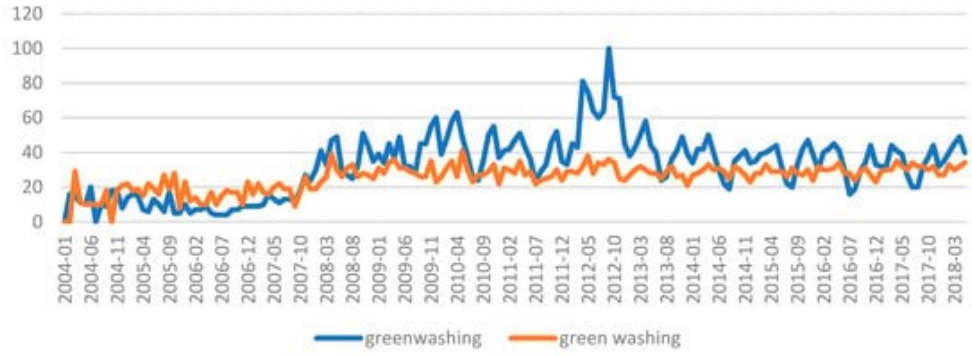


Figure 1.1: Dynamics of the frequency of "greenwashing" use (defined by Google Trends)(Pimonenko et al., 2020)

In conjunction with these studies, numerous worldwide studies outline the adverse effects of greenwashing in the development of the green economy, the reputational damage created, and the various ripple effects resulting from a fraudulent claim for consumers and investors. (Galletta et al., 2024; Hickman, 2008; Montgomery, Lyon, & Barg, 2023; Peterson, 2024; Yang et al., 2020)

In all the policies pertaining to the issue of green growth, the prevalence of greenwashing remains highly relevant. Companies with various policies are even incentivized to greenwash. This incentive arises from the competitive advantage that green credentials can confer in the marketplace, often without the requisite substantiation of true sustainability practices (Hickel, 2019; Hickel & Kallis, 2020).

As such, greenwashing is not only classified as a problem for the economy but it seeps into the societal and technical context of design in corporate practice and overall impact. Taebi (2021) argues for the complex nature of sustainability, as viewing any aspect(Society, technical understanding, economy etc.) in a vacuum, will lead to window-dressing and greenwashing purposes as well as political manipulation. In a later study by Y. Liu et al. (2023) it is also argued that greenwashing can only be seen as a collective of stakeholders and decisions, pertaining to interpretations of green laws and sound corporate strategy. This inseparable quality

of greenwashing from its core components makes a systemic understanding of the phenomenon, invaluable for understanding and mitigating the problem.

1.2.2. Literature Gap

While the individual manifestations and corporate motivations of greenwashing have been studied intensively, there is an important gap in the literature regarding its understanding as a systemic issue part of a greater socio-technical landscape. Current research often isolates greenwashing as a series of deceptive marketing practices without fully considering how it is influenced by the interplay of regulatory frameworks, technological infrastructures, market dynamics, and cultural narratives. This narrow focus overlooks the multilevel interplay of societal, technical, and organizational factors involved in shaping and maintaining greenwashing behaviours. There is an urgent need, for an approach to analysis, that will map these interdependencies holistically, indicating how various elements within the socio-technical system may each contribute to the persistence and evolution of greenwashing. This would not only help to understand the root causes but also give insight into the development of more effective strategies in the struggle against greenwashing at a systemic level.

1.2.3. Institutional Greenwashing

As Green projects anticipated more ludicrous profits for corporations (Marquis & Toffel, 2012), regulation evolved to meet specialized criteria rather than regulatory inadequacies and arbitrage (Godemer, 2022). This led to the phenomenon described here as ”institutional greenwashing” where organizations leverage their positions as large corporations to create an impression of environmental responsibility without genuinely engaging in sustainable practices(O'Neill, 2024).

Siano et al., 2017, examines how multinational corporations (MNCs), State-owned Enterprises (SOEs) and private firms pose an implicit greenwashing threat. They identify the six most common greenwashing schemes but also showcase how immature legal frameworks can manifest these schemes. Unlike isolated incidents of greenwashing, institutional greenwashing is deeply embedded within the strategic and operational frameworks of these entities, making it a pervasive issue that is difficult to combat. The mechanisms through which institutional greenwashing operates are sophisticated and often involve a combination of selective disclosure, manipulation of certifications, strategic communication, and partnerships. For instance, companies frequently engage in selective disclosure, emphasizing specific environmental achievements while omitting information about ongoing harmful practices. This creates a skewed perception of their overall environmental impact, allowing them to maintain a facade of environmental stewardship without enacting significant changes (Siano et al., 2017).

Strategic partnerships and sponsorships also play a significant role in institutional greenwashing. Corporations often collaborate with environmental organizations or sponsor high-profile green initiatives as a means of enhancing their green credentials. While these partnerships can yield some positive outcomes, they are frequently used to divert attention from the less sustainable aspects of a company's operations, thereby reinforcing the misleading narrative of environmental responsibility (Mobiquity, 2021; Siano et al., 2017). These mechanisms are underpinned by several systemic drivers, including regulatory gaps, market pressures, and information asymmetry.

The green economy itself can be seen as a victim of greenwashing. Boehnert, 2016, argues that within the green economy, corporations can self-regulate their green credentials using tools and certifications that conceal their polluting activities. This institutional greenwashing involves making unsubstantiated or misleading claims about the sustainability of the green economy, masking its lack of effectiveness and continued commitment to growth-as-usual (Hickel, 2019).

The present thesis will look mainly into three prominent events of institutional greenwashing from a systems perspective.

1.2.4. Introduction to the Case Studies

To explore the systemic nature of institutional greenwashing, this thesis will analyze three major greenwashing incidents that have had significant impacts on their respective industries and the broader economy:

- **Volkswagen's Dieselgate Scandal:** This case involves Volkswagen's intentional manipulation of emissions data to present its diesel vehicles as environmentally friendly. The scandal not only resulted in severe legal and financial repercussions for the company but also highlighted the systemic failures in regulatory oversight and corporate governance that allowed such deceptive practices to occur(Jong & van der Linde, 2022).
- **DWS Scandal:** The DWS scandal revolves around allegations of misleading claims about the environmental, social, and governance (ESG) standards of investment products. This case exemplifies how

financial institutions can exploit ESG metrics to greenwash their products, raising questions about the effectiveness of voluntary disclosures and the integrity of ESG certifications(Clowes, 2022).

- **Shell v. Millieudefensie Case:** The Shell case involves accusations of the company overstating its environmental commitments while continuing practices that contribute to environmental degradation. This case illustrates the challenges in holding large multinational corporations accountable for their environmental claims, especially when they operate in jurisdictions with varying regulatory standards("Milieudefensie et al. v. Royal Dutch Shell plc. - Climate Change Litigation", 2024).

These cases will be further analyzed in Chapter 2 where the broader context is analyzed.

1.2.5. Research contribution of a Systems Approach

The Conventional methods of accident analysis include Fault Tree Analysis (Kabir, 2017) (FTA), Event Tree Analysis (Simmons & Clemens, 1998) (ETA), and Human Factors Analysis and Classification System (Shappell & Wiegmann, 2000). The main idea in these three methods is "event-driven", whereby, accidents are generated by a series of abnormal events. However, with the increase of system complexity and events coupling, another category of investigation of the causes of accidents was adopted. System engineering models comprehensively consider the interaction of society and technology, and their subsystems (Meng et al., 2023). They include Rasmussen's socio-technological system risk management framework (Rasmussen, 1997), Rasmussen and Svedung's accident map model (Rasmussen & Svedung, 2000) (AcciMap), the functional resonance analysis method (Hollnagel, 2012) (FRAM) and the system theory accident model and process (Y. Zhang et al., 2022) (STAMP). These methods have laid the groundwork for considering "Greenwashing" as the "Adverse Outcome" in Safety analysis with a sociotechnical approach favoured by Rasmussen's tool.

A Systems approach would shed light on the identification of systemic factors contributing to greenwashing, such as regulatory gaps, management decisions, and socio-economic influences. This helps in understanding how different layers of society and corporate structure interact to facilitate or mitigate greenwashing. By providing a framework to develop controls in greenwashing prevention and corporate misconduct, the approach offers a structured method to address these issues comprehensively. A multi-actor approach, implementing a Safety Science standardized framework, showcases the systemic failures in greenwashing cases and helps pinpoint critical areas for intervention.

1.3. Problem Definition

Globally, policymakers are engaging in efforts to address the challenges posed by greenwashing. However, discrepancies in their approaches, influenced by distinct philosophical and political considerations, are introducing a greater degree of ambiguity for those involved in the industry.(Godemer, 2022)

As Yang et al., 2020 suggests, research should delve deeper into understanding the consequences of greenwashing across various industries and from different perspectives, and this is reinforced by the apparent gap in approaching Greenwashing from a sociotechnical perspective.

The issue of greenwashing resulting from the complex interplay between technology, corporate practices, and societal values, is one of the leading financial & reputational risks to organizations as stated by ESMA, 2023, thus proposing a clear problem for analyzing greenwashing from a sociotechnical perspective.

1.4. Research questions and objectives

According to the problem articulated in the previous section, we structure the main research question and sub-question of the research.

How can "Greenwashing" be conceptualized as a systemic failure within complex socio-technical systems?

Sub-Questions:

1. What are the systemic influences across the cases?

Theoretical Aim: The objective of this research is to expand the understanding of greenwashing by framing it as a systemic issue rather than an isolated practice. Viewing greenwashing as a systemic failure that emerges from interactions among various stakeholders across the value chain offers a more comprehensive perspective on the phenomenon. As described greenwashing spans through the societal structure and is seeped deeply into culture ethics and the economy. Existing studies have primarily focused on defining and conceptualizing greenwashing and investigating its causes (Montgomery, Lyon, & Barg, 2023; Seele & Gatti,

2017; Siano et al., 2017). However, most have not fully explored greenwashing as a complex issue influenced by a network of actors and factors within and outside of organizations. By analyzing greenwashing as a systemic issue, this research aims to illuminate the dynamics between stakeholders that facilitate or hinder greenwashing practices, thereby providing a foundation for developing more effective risk management frameworks related to corporate responsibility, ethics, and environmental management.

Practical Aim: In developing this research a foundation for combating corporate greenwashing (intentional and unintentional) is put into place, documenting the focal points and the major influences that contribute to greenwashing. The insights gained from this research will be instrumental in developing tools and strategies for detecting and mitigating greenwashing, which will be of significant value to companies and governments. In the current environment of regulatory uncertainty and potential for regulatory arbitrage, such tools will be crucial for ensuring that environmental claims are genuine and that sustainability efforts are both effective and credible.

Taking all the above into account the research has set forth a specific objective based on the questions asked:

Objective I: To identify, and analyze the common systemic influences contributing to greenwashing from three high-profile incidents in various industries.

1.5. Research Design & Outline

The Research design will make use of Rasmussen, 1997; Rasmussen and Svedung, 2000 work to map the chain of events and the systemic factors that contribute to greenwashing. This approach is particularly suited to this study by enabling a comprehensive analysis of the multi-layered interactions between regulatory frameworks, corporate structures, and market dynamics that perpetuate greenwashing.

The guidelines for a standardized Accimap design have been set out by Branford et al., 2009 and to create each Accimap this approach is followed. As mentioned in section 1.2 three cases of Institutional Greenwashing will be analyzed and an Accimap will be constructed for each one. Due to the need for Accimaps to have a complete data set and a full serialization of events, but also to assert the greenwashing cases are ”conclusive in their consequences” we adopt the definition and choose three cases that are well documented and regarded as ”Greenwashing incidents”.

Finally, after constructing the Accimap for each case, we will synthesize it for a meta-analysis as proposed by P. M. Salmon et al., 2020 to identify consistent and generic actors/influences that permeate across the greenwashing cases.

Figure 1.2 is a rough outlook of how the trajectory of the research plan looks like to answer the research question set out.

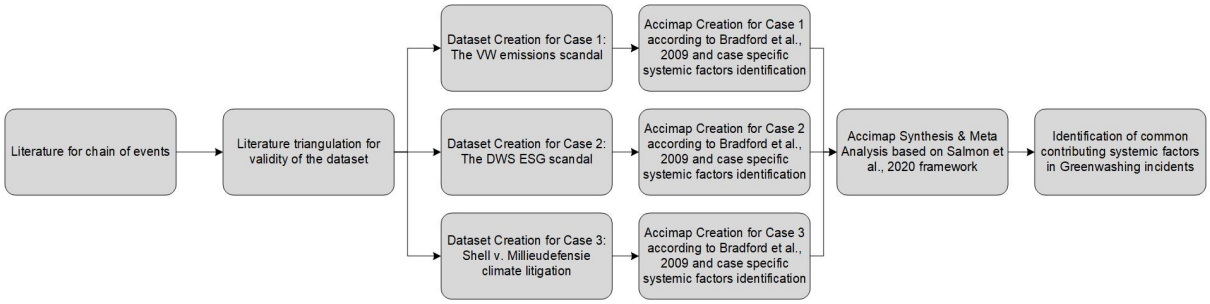


Figure 1.2: Research design simplified flowchart of events

Chapter 2
Methodology

2.1. Chapter Summary

In this chapter, the theoretical background of the dissertation is analyzed. The main goal of this chapter is to give a contextual understanding of the risk management framework and how we approached the deconstruction of the cases with the Accimap method, but also to showcase the attempted approach to scope the current literature on greenwashing in Rasmussen's methodology. As the Accimap methodology requires the adverse outcome to be evident, the consequences of greenwashing are listed here along with the various stakeholders affected as mentioned in the current literature. The subsequent creation of the dataset is also illustrated within the context of this thesis and the cases but also how the three dataset's validity and reliability are ascertained. Finally, a general overview is given on the meta-analysis approach designed by P. M. Salmon et al. (2020) and adapted into this research.

2.2. Methodology Considerations

Although there is abundant literature on the use of Accimap(Chassery et al., 2021a; Oleo et al., 2022; Siano et al., 2017; Stanton et al., 2023) as a method to analyze accidents, this method hasn't been used until now to explore greenwashing incidents.

Systematically mapping the layers of influence and their interactions in greenwashing helps test the roles of stakeholders, as suggested by Montgomery, Lyon, and Barg (2023), and provides a foundation for better regulatory control Peterson (2024). This thesis aims to address the literature gap on greenwashing as a systemic failure in a complex environment.

Similar to the case of an accident, greenwashing incidents are the result of multiple socio-technical factors that lead to greenwashing situations. It will be beneficial to society to look into Accimaps of past greenwashing incidents and draw conclusions as to how mistakes or failures at one layer, impact inadequate or lack of controls at the next level, interconnecting and leading eventually to a greenwashing incident or the recognizable repercussions (Yang et al., 2020).

Rasmussen's Accimap model (Rasmussen, 1997) fits better the purposes of the present thesis, as it considers different contributing factors and their interactions, in a causal diagram, which primarily contributes to achieving the objectives of the thesis. The model uses six hierarchical levels or layers, wherein each level-specific events take place. The levels from top to bottom, are described as: Government, Regulators-Associations, Company, Management, Staff and Work. A sketch of the hierarchical levels is shown in Figure 2.1 , as adapted from Rasmussen (Rasmussen, 1997). This structure is essential for achieving the thesis's objectives, as it allows for a detailed examination of the multi-layered factors involved in greenwashing, thereby contributing to a deeper understanding of the systemic nature of this problem.

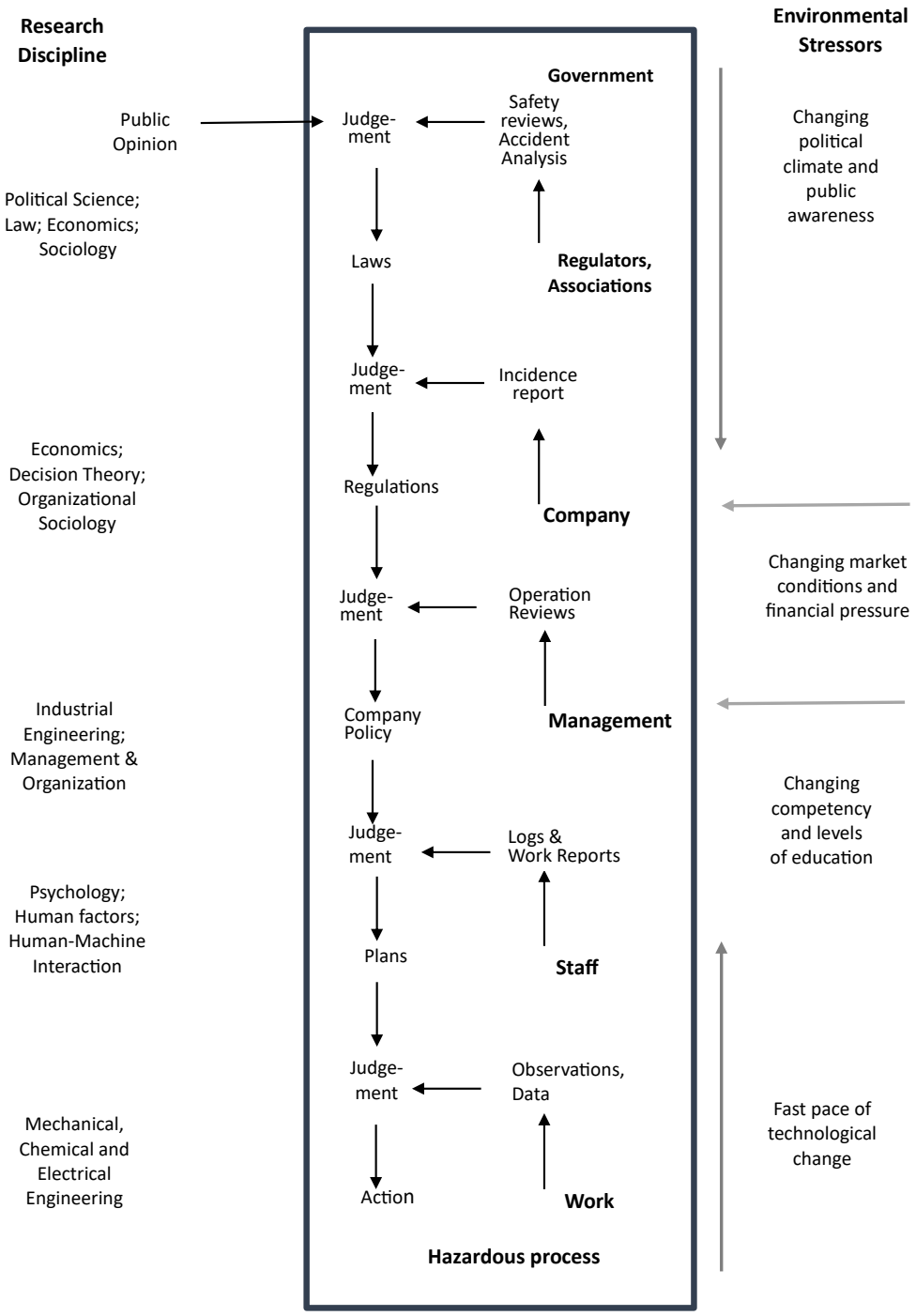


Figure 2.1: Rasmussen's risk management framework based on the assumption of a dynamic society (Branford et al., 2009; Rasmussen, 1997; Rasmussen & Svedung, 2000)

2.3. The Accimap Methodology

The Accimap methodology has seen wider application due to its ability to provide a detailed and holistic view of accident causation within socio-technical systems. For instance, Wienen et al. (2024) extended the Accimap method to analyze a severe telecommunications accident, highlighting how it can be adapted for different contexts and improve accident analysis. Ma and Chen (2024) utilized Accimap alongside unsupervised natural language processing to analyze construction accident reports, demonstrating its utility in identifying systemic risks in complex environments.

In the context of occupational risk assessment, Giménez et al. (2024) applied the Accimap methodology to assess risks in advanced oxidation processes (AOP) laboratories, aligning their management systems with the United Nations Sustainable Development Goals (SDGs). Diaz et al. (2024) compared Accimap with other systematic accident analysis tools like STAMP and FRAM to investigate food safety incidents, showcasing the versatility and effectiveness of Accimap in diverse applications.

This versatility however is predicated on a robust understanding of capturing and analyzing the various factors contributing to an incident. Goode et al., 2021 emphasize the importance of a robust database for collecting and managing this data, which serves as the foundation for identifying contributory factors across different system levels. This dataset should encompass various sources of data, including incident reports, regulatory documents, and stakeholder interviews, to ensure a holistic view of the incident. Additionally, it is underlined how the framework requires a deep understanding of the incident's context, including the chronological sequence of events, the interactions between different system components, and the environmental and organizational conditions present at the time of the incident (Grant, 2020; Rasmussen, 1997; Rasmussen & Svedung, 2000).

2.3.1. Expanation of the risk management framework

Following each level in Figure 2.1, there is a brief description of events that can be attributed to each level. On the left side in the downstream, we may identify the Research Discipline which we investigate and wish to describe. On the first level, under the term Government, we find as the main input the Public Opinion. In every nation, public opinion on major incidents is a crucial factor, which cannot be ignored by Governments. On the second level, we find Regulators, Associations. The events here relate to the Academic disciplines of Political Science; Law; Economics, or Sociology. Since the model was developed for general use in the area of accidents any of these scientific areas or a combination of them might fall under the general term *"Regulators, Associations"*. We must bear in mind that Accimap is a general methodology and so far, it has been used widely to describe many and diverse subjects throughout the world, including accident investigations (P. M. Salmon et al., 2020), road safety (Stanton et al., 2023), Covid-19 (Chassery et al., 2021a),court decisions (Hamim et al., 2020), or even integrate the two first levels into a unique level, if it suits better the needs of the Accimap model (Tabibzadeh et al., 2017).

The level describing the Company, relates to Economics; Decision Theory; Organizational or Sociology. These issues may be discussed, with emphasis on the internal regulations of the company, regarding the specific incident (Ma & Chen, 2024). The last three levels, tend to be more specific, as they tend to be closer to the "evolving events". Thus, Management is described by the disciplines of Industrial Engineering; Management & Organization. At this level, the company decisions or regulations, are translated into specific instructions and may involve technical, social, legal, or a mixture of socio-technical instructions necessary for the operation of the company, plant, etc. At this level, managers usually are pressed by financial cuts or restrictions from the higher levels and technical limitations from the lower levels. A company's financial success in a competitive environment usually comes when it operates at the fringes of the accepted practice. In critical situations, it is here where the technical barriers usually are pushed to their limits, and if they cross them, the results are irreversible, leading to all kinds of accidents (Rasmussen, 1997; Rasmussen & Svedung, 2000).

The next level involves the staff, the engineers or generally employees whose job is to implement the management's instructions into working actions. The Academic terms describing this layer are Psychology; Human factors; Human-Machine and Interaction. It is the place where accidents happen and they are the front people who first see the incidents to develop and the first people who try to handle the evolving incident. Whatever instructions a person receives to complete a task, it leaves many degrees of freedom or choices, even when the task is completed. In the past, it was a usual practice to blame them for whatever incident was evolving at the front level for "human error", and took a long time for society to understand the complexity of incidents, and learn to draw the right conclusions on how to make the processes safer (Rasmussen & Svedung, 2000).

The last level describes the place of Work, with Mechanical, Chemical and Electrical Engineering installations (Rasmussen & Svedung, 2000). However, as the use of Accimap evolved beyond the accidents at the industrial plants to include a description of incidences such as forest fires (P. M. Salmon et al., 2014), road

accidents (Stanton et al., 2023), etc, the term Equipment and Surroundings is used, as the near environment where the incident evolves, needs to be addressed (P. M. Salmon et al., 2014; Stanton et al., 2023). In other cases, where it is the result of the overall events that is the point of interest, Work is replaced by the term Outcome (Baek et al., 2023; Tabibzadeh et al., 2017).

Having briefly discussed the downstream flow of events at the left-hand side of the Rasmussen's Accimap model (Rasmussen, 1997; Rasmussen & Svedung, 2000), we draw our attention at the right-hand side of the schematic diagram, Figure 2.1. Here, the information flows from the bottom of the events, upwards up to the Government level.

From the bottom level of Work, or Equipment and Surroundings, information flows upward to the next level of Staff, where any observations made or data collected at the last level, must be reported to the Staff, so that a judgement must be made, taking into consideration the downstream plans. A judgment or analysis of the interaction between the information collected on the spot at the Work layer and the plans flowing downstream is necessary, to make any adjustment required at the working level.

Going upwards to the Management layer, logs and work reports must be compared and if necessary adjust them to the Company Policy. The Management's Operation Reviews also have to implement the Company's Regulations. Any Incident Reports concerning the Company, have to take into consideration the current legislation concerning them. Finally at the top, with Safety Reviews and Accident Analysis, is where society seeks to control safety, through the legal system (Rasmussen, 1997). On the right-hand side, outside the sketch, we find the Environmental Stressors. At the bottom with the vector pointing upward towards the Company, the very Fast pace of technological change is placed, which is found at almost every operative level of society within domains of industry, manufacturing, transport, etc. (Rasmussen, 1997). This is probably more evident with the recent advancements in the field of Artificial Intelligence (Dwivedi et al., 2023). The Changing levels of competency of the personnel within a company is always an issue in organizations and inevitably it can impact to the development of an incident. From the top towards the Company, Changing political climate and public awareness, also impact on the Company. When all these issues integrate in the Company, the result is continuous Changing market conditions and an increasing financial pressure. In the present thesis, the implementation of the Accimap is discussed separately for each of the three Greenwashing cases examined, as each of them evolved in a different environment.

2.3.2. The theoretical Accimap construction

In section 2.5 the specific steps taken to create each individual Accimap are presented but here a preface on the theoretical approach of Accimap structure will be explained.

To create an AcciMap, the first step is to identify and define the negative outcome, which is the starting point of the analysis. This outcome is placed at the bottom of the diagram. Analysts then compile a comprehensive list of all potential causal factors associated with the accident. These factors are systematically categorized according to their hierarchical level within the sociotechnical system and are placed in the corresponding sections of the AcciMap (Branford et al., 2009; Rasmussen, 1997).

For this reason in section 2.3.4 the consequences of greenwashing are laid out, to showcase what we expect at the end of an analysis. The consequences of a greenwashing incident are the primary point where greenwashing is observed from its outcome. The lack of a definition has led many to speculate how one can observe it as it is happening, or when is the *"point of birth"* of greenwashing (Taebi & Safari, 2017). Regardless of its origins and in-between apparentness, the consequences of an incident regarding false sustainability claims over a service or product will almost always be labelled greenwashing (Seele & Gatti, 2017).

The next step involves linking these causal factors with arrows to illustrate the cause-and-effect relationships between them. This linkage ensures a logical flow of causation from higher-level systemic issues down to the immediate causes of the accident. For instance, organizational policies might influence operational decisions, which in turn affect frontline activities and can eventually lead to an accident if there are systemic deficiencies (Branford et al., 2009; Rasmussen & Svedung, 2000).

The guidelines for constructing an AcciMap emphasize the inclusion of factors that are of practical significance, meaning those that could potentially be addressed or mitigated. This practical focus helps in making the analysis actionable. Additionally, factors necessary for understanding why the accident occurred but which cannot be practically addressed are also included; these are visually distinguished in the diagram to indicate their role in the causal chain without implying direct interventions (Branford et al., 2009).

In figure 2.2 the theoretical approach proposed by Rasmussen and Svedung (2000) is showcased to conceptualize how the methodology works. Since then, however, the implementation into various fields and the versatility evolved and expanded its use without having these hard parameters in place (Ma & Chen, 2024; Scott-Parker, Goode, & Salmon, 2015; Torres, Nadeau, & Landau, 2022). The overall key concepts are analyzed, since in the present thesis we consider them important in the structure and creation process of the

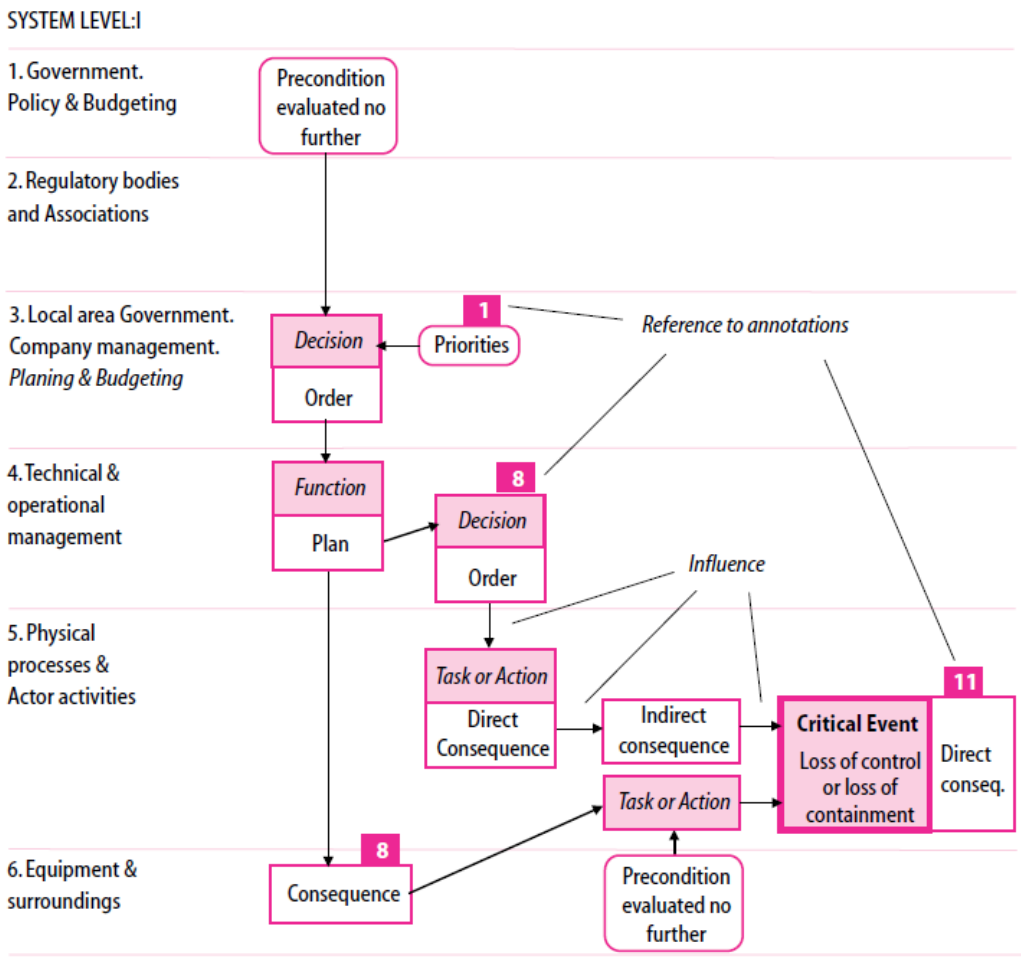


Figure 2.2: Proposed Structure to the Accimap by Rasmussen and Svedung, 2000

Accimaps.

2.3.3. The "Critical Event"

In the words of Rasmussen and Svedung (2000) *the critical event in the context of AcciMap analysis refers to the pivotal incident or occurrence that leads to the release of a particular hazard source, which then triggers a sequence of events resulting in an accident.* The identification and analysis of the critical event are central to understanding the causative factors and developing strategies to mitigate similar incidents in the future.

In AcciMap methodology, a critical event is defined as the point at which control over a hazard is lost, leading to an accident. This could be a physical event such as the rupture of a tank or a failure in operational processes like inadequate safety procedures or delayed responses(Rasmussen, 1997; Rasmussen & Svedung, 2000). The critical event is not merely the accident itself but includes the key moment where intervention could have prevented the adverse outcome(Branford et al., 2009; Rasmussen & Svedung, 2000).

The process of identifying a critical event begins with the creation of a cause-consequence chart (CCC), which maps out potential accident scenarios related to specific activities or systems. This chart highlights the critical event as the juncture where a hazard is released, leading to various possible accident trajectories depending on subsequent actions and system responses(Rasmussen & Svedung, 2000). For instance, in the analysis of a transport accident involving hazardous goods, the critical event might be the loss of containment of a dangerous substance, which then leads to environmental contamination or public safety hazards(Rasmussen & Svedung, 2000).

A critical event is chosen based on its ability to structure the design of protective measures and risk management strategies effectively. It represents the focal point around which the entire causal analysis is organized, allowing for a comprehensive examination of the factors leading up to and following the event. This helps in identifying systemic weaknesses and areas for improvement across different levels of the sociotechnical system(Branford et al., 2009; Rasmussen, 1997; Rasmussen & Svedung, 2000).

In chapter 6 we will use P. M. Salmon et al. (2020) developed methodology to conduct a meta-analysis based on the Accimaps of chapters 3, 4, 5. Particular to this analysis is the identification of the critical events as it provides a basis for generalizing across multiple accident scenarios. By understanding the common factors that contribute to critical events, broader safety recommendations and proactive risk management practices that address these underlying issues can be developed. This approach ensures that safety interventions are not just reactive but also preventative, targeting the root causes that can lead to a wide range of accidents(Branford et al., 2009; Rasmussen & Svedung, 2000)

2.3.4. The consequences of greenwashing

The adverse effects of greenwashing, as highlighted by the reviewed literature, are multifaceted, impacting both consumer trust and corporate credibility. Aji and Sutikno (2015) emphasize that greenwashing fosters consumer scepticism, which in turn leads to diminished trust in not only the offending company but also in environmentally-friendly products in general. This erosion of trust is further compounded by consumers' switching intentions, where customers opt for competitors they perceive to be more honest. Similarly, Vangeli et al. (2023) note that greenwashing undermines the development of genuine green business-to-business (B2B) marketing by creating a climate of suspicion that makes stakeholders wary of green claims. This mistrust extends beyond individual companies to entire industries, complicating efforts to promote sustainable practices and innovations.

Moreover, the internal repercussions for companies engaged in greenwashing are significant and multifaceted, including both reputational and financial damages. L Gatti (2019) discuss how greenwashing leads to internal conflicts and reduced employee morale, as workers become disillusioned with the discrepancy between the company's public environmental stance and its actual practices. FMJ Teichmann (2023) highlight that greenwashing can result in severe financial penalties and regulatory sanctions, as seen in high-profile cases where companies have been fined for misleading environmental claims. Financially, companies can suffer from direct fines and litigation costs, as well as long-term impacts on their stock prices and market valuations. GI Kassinis (2022) argues that greenwashing can lead to long-term reputational damage, which can buffer immediate market consequences but ultimately harm a company's standing and investor relations. The loss of consumer trust and loyalty, combined with increased regulatory scrutiny, can create a hostile environment for business operations and growth. The takeaway is clear, adverse effects of greenwashing extend beyond superficial market reactions, fundamentally undermining both consumer confidence and corporate integrity, while also imposing significant financial burdens on the companies involved.

2.4. Greenwashing Cases

Recent research has increasingly utilized the AcciMap methodology to address complex issues in sustainability and the green economy, particularly focusing on greenwashing practices. A study on the major recent failures in mine waste containment facilities in Brazil by Fraga Filho, Aleixo, and Amaral (2023) investigates potential greenwashing through corporate sustainability reporting, highlighting how such reports may mask the true environmental impacts of companies' actions. Another notable application of the AcciMap methodology is seen in the root-cause analysis of the Aliso Canyon gas leak, where Tabibzadeh et al. (2017) employed AcciMap to elucidate hidden environmental tradeoffs and greenwashing strategies, demonstrating its effectiveness in uncovering underlying issues in sustainability practices. These studies underscore the versatility of AcciMap in analyzing and revealing the intricate dynamics of greenwashing and sustainability, providing a robust framework for examining the authenticity of corporate environmental claims and their alignment with true sustainable practices.

The current studies however don't explicitly state that greenwashing can be viewed as the accident itself and focus on singular events with a contributory factor (systemic influence) being greenwashing. This gap combined with three representative cases can become the cornerstone for analyzing greenwashing incidents in the future through identification of systemic factors present. In this case, three cases with severe impact on how the industry changed were chosen and how the regulatory and governmental institutions also adapted after the respective scandals were made known.

2.4.1. Case 1: The VW emissions scandal

In the wake of the 2015 Environmental Protection Agency (EPA) investigation into Volkswagen, it found that installed software in VW vehicles was designed to cheat emissions tests in as many as eleven million cars worldwide.(Peterson, 2024) The aftermath of the Volkswagen (VW) Greenwashing scandal, also known as "Dieselgate," has had significant repercussions on the company's reputation and financial standing. (Jung & Sharon, 2019) The ripple effects from such an event, affected public perceptions and trust in corporate environmental commitments across the board. Majláth (2016) discusses how it led to increased scrutiny and regulatory pressures across the automotive sector, affecting stock prices and market perceptions of diesel

technology but also had a societal impact raising public health concerns due to increased pollution and highlighting the ineffectiveness of existing regulatory frameworks to detect such frauds. Ten years later (Montgomery, Lyon, & Barg, 2023) argues that greenwashing is ”more virulent than ever” and that the proliferation of environmental, social, and governance commitments are fraught with misleading claims, exacerbating the challenge of addressing pressing environmental and social issues. They lay out a research agenda that points to critical open questions and suggests examining emerging tactics and the need for forward-looking research to understand and counteract these contemporary forms of greenwashing. They conclude that the most impactful research would encompass the ”when, why, and how corporations greenwash, with the intent being not to simply show that it is happening, but to consider what tools can stop it.” Montgomery, Lyon, and Barg (2023) also argue that an agglomeration of contributing factors such as transparency, stakeholder activism, government policy, and more, with clear and actionable solutions, will contribute to a systemic view of the problem and seek to shield practitioners who want to avoid it.

The Volkswagen Dieselgate emissions scandal stands out as a seminal case in accident analysis and greenwashing due to its profound implications on corporate governance and environmental ethics. According to Poier (2020), the scandal revealed significant failures in corporate governance at Volkswagen, where executives knowingly manipulated emission tests to present diesel engines as more environmentally friendly than they were. This deception not only constituted a major breach of trust but also showcased the lengths to which corporations might go to greenwash their products for competitive advantage. DURA (2019) highlighted the extensive financial and legal repercussions for Volkswagen, emphasizing the broader impact on the automotive industry and regulatory frameworks worldwide. The scandal triggered a reevaluation of emission standards and testing protocols, reinforcing the need for stringent oversight to prevent similar greenwashing practices. Bovens (2016a) further explored the ethical dimensions of Dieselgate, arguing that it served as a critical reminder of the ethical responsibilities of corporations toward the environment and society.

Besides the outstanding character of the case in the field of greenwashing research, the sheer data available that documents the event as well as the various court cases around the world make the VW scandal a prime candidate for implementing the Accimap framework. As mentioned in section 2.3 the chain of events and robustness of the dataset is paramount to construct an Accimap. As such the Volkswagen Case is representative in Magnitude and data to be used with the methodology and help shed light on the various systemic factors that enabled it.

2.4.2. Case 2: The DWS ESG misrepresentation Lawsuit

Deutsche Bank along with DWS, its asset management arm, is the second most high-profile greenwashing incident from a German company, and the highest in the banking sector.(Kaminski, 2023) The ripple effects resulting from ESG misrepresentations in DWS's portfolio set a standard for increased transparency demand as well as regulations to combat similar tactics in the banking sector but also showcased to asset managers everywhere the fallibility of misrepresenting ESG investments (Gendre, 2024b). Whilst the case against DWS is still ongoing, there are conclusive decisions and punishment (financial and reputational) from the US SEC.(Kaminski, 2023; Sims & Prentice, 2022) It's an important precedent for how regulators may approach and enforce ESG compliance in the future. The case may further set industry standards as it continues to be investigated, forcing asset managers to work on more rigorous and open ESG practices in order to avoid similar scrutiny. A heightened regulatory environment could force a broader re-evaluation of the banking and finance sectors' ESG investment strategies, compelling the firms to ensure that any sustainability claims made are accurate and based on hard facts (Gendre, 2024b).

Finally, the case's reporting and significance for the banking and financial sector allow for the creation of a robust dataset, a clear timeline and several event connections that may affect or have affected the outcome (greenwashing consequences). Therefore, this case is also very interesting in analysing within Rasmussen's framework.

2.4.3. Case 3: Shell v. Millieudefensie Greenwashing Court Case

The case of Shell is quite central to greenwashing research and a harbinger of future legal battles, as it brings out the growing legal accountability for corporate claims on the environment. The 2021 Dutch court ruling against Shell was a telling precedent, legally binding it to drastically reduce its emissions, marking a turn in how corporations are held liable for their actions on the environment.(“Milieudefensie et al. v. Royal Dutch Shell plc. - Climate Change Litigation”, 2024) This case also puts a spotlight on increased scrutiny from US and European regulators, including greenwashing allegations from organizations like Global Witness and investigations by the UK's Advertising Standards Authority. Together, these developments signal the broader trend toward more rigorous enforcement of climate-related disclosures, which further squeeze companies to be more open and responsible regarding their environmental performance. The Shell case has again underlined how difficult it is for multinationals to get away with some superficial compliance and at what cost

in a global community demanding real and quantifiable action on climate change (Parliament, 2024). The data from the court case over specific events and actions that Shell indulged in as well as the multitude of examples provided for the verdict provide an excellent dataset that's verified by the relevant authorities. The importance of the case and its results also had a ripple effect on how the misrepresentation of data points and emissions will be dealt with legally from then on.

Shell's history is riddled with cases of misrepresenting and misleading consumers and has become one of the most reported on companies by green activist groups in recent years (Stockman, Rowell, & Kretzmann, 2009). The constant scandals led to increasing scrutiny but also shed light on Shell's corporate strategy: of complete divestment from renewables and a reinvigorated focus on Oil & Gas (Frost, 2024). As such this case is not only representative of its field, but also the Accident analysis will showcase how corporate decisions such as the one mentioned above, directly correlate with the greenwashing claims.

2.5. The Accimap methodology in the three cases

Since its introduction in 1997, Accimap has been applied for accident analysis in a variety of domains, ranging from rail, oil and gas, aviation, and maritime to outdoor recreation, space exploration, and public health (Hulme et al., 2019).

However, the extent to which models, methods, and tools for systemic accident analysis such as Accimap yield valid outcomes (e.g., how accurately Accimap analysis identifies the causes of an accident) and reliable outcomes (e.g., the consistency with which different analysts produce similar Accimaps) is often seen as a crucial criterion for evaluating their suitability for accident analysis (Waterson et al., 2017). When Rasmussen invented the risk management framework (Rasmussen, 1997), he didn't write any rules as to how to draw an Accimap (Waterson et al., 2017). The majority of studies published report very few details of how the Accimap they propose was constructed (Waterson et al., 2017). Ryan, Hutchings, and Lowe, 2010 expressed concerns about reliability and validity as part of a list of eight essential criteria for methods used in incident investigation and analysis. Accimaps appear to meet the first seven requirements in Table 2.1. Branford, 2007 conducted a comprehensive study on the reliability and validity of Accimap analyses, concluding that Accimaps do not always accurately identify the causes of accidents or recommend the most suitable corrective actions to prevent future occurrences.

Table 2.1: Requirements for methods for accident investigation and analysis(Ryan, Hutchings, & Lowe, 2010; Waterson et al., 2017)

No.	Requirement
1	Have a clear scope for analysis (e.g., whether it should focus at the level of the work and the technological system, or more broadly at influences from government and regulators)
2	Be influenced by a model or group of models
3	Provide a detailed description of the accident, including a visual representation of the accident sequence if appropriate
4	Search for and reveal underlying causes
5	Contribute to understanding of prevention (e.g., safety barriers)
6	Help in generating recommendations
7	Give consideration to practical aspects, such as the level of education and training that is needed to use the method
8	Be valid and reliable

To address these issues and enhance the validity and reliability of the methodology, Branford et al., 2009 developed a set of nine guidelines for constructing Accimaps. These guidelines offer specific steps and prompts for analysts, representing a significant improvement over the previously limited information available.

2.5.1. Using Branford and Hopkins nine guidelines to draw an Accimap

The actual drawing of an Accimap diagram is case-specific and provides the necessary context for gaining a comprehensive understanding of how and why the incident happened (Branford et al., 2009). However, the technique to start drawing an Accimap has been described in the past by Branford et al., 2009, and it was very helpful to follow nine simple steps and draw the Accimap for the three greenwashing incidents we analyzed in this thesis.

- **Step 1:** Draw the six levels on an empty page. In the present thesis, we used the program Visio, which is one of the appropriate tools for drawing Accimaps.
- **Step 2:** Identify the outcome(s).

  - 1) By analyzing the literature of the incident, we were able to establish the negative outcome(s).
  - 2) Insert the outcome(s) into the "Outcomes" level of the Accimap. In the three greenwashing incidents, the outcomes were a large fine from a court for misleading the public by a company, a jail sentence by a court to an employee of a company who assisted his employers to use cheating devices on cars, or the admittance and resignation of the CEO of a company for overstating its sustainability actions and cheating its clients. All these were considered greenwashing in hindsight and were analyzed in section 2.3.4.

- **Step 3:** Identify the causal factors. A list of all causes of the incident data was made, that is, all factors for which one could say "had this been otherwise, the incident would probably not have occurred." Sometimes, when it was unclear whether or not a specific factor was a sufficient cause, it was included in the list anyway and eliminated later if proven otherwise (Branford et al., 2009).
- **Step 4:** Identify the appropriate Accimap level for each cause. Next to each cause, the appropriate Accimap level in which it could belong was identified. Branford et al., 2009 provided a table with many examples to assist in determining the correct level. The first column of the table defines the levels of an Accimap, and the second provides examples of the types of causes that may be found at each level (Branford et al., 2009). The list is not exhaustive, but for someone with no experience in drawing Accimaps, the table is very helpful as it provides examples on Government, Regulatory bodies, Society, Financial issues, Organizational culture, etc.
- **Step 5:** Prepare the causes. Once a cause was identified, an effort was made to:
  - 1) Keep it brief.
  - 2) Use wording that makes "what went wrong" clear to everybody.
  - 3) Use wording that suited the level at which the cause is located. For example, at the layer of Staff, the wording "employees assisted the management to cheat" was used, not "George Smith and William Jones assisted the management to cheat."
- **Step 6:** Insert the causal links. Here, the authors (Branford et al., 2009) suggest rearranging the causes in the Accimap so that the causes lie directly above their effects, as indicated in Figure 2.3. The causal links in dotted lines represent the indirect consequences of decisions made. Only direct causal links are considered in the later stages of analysis.

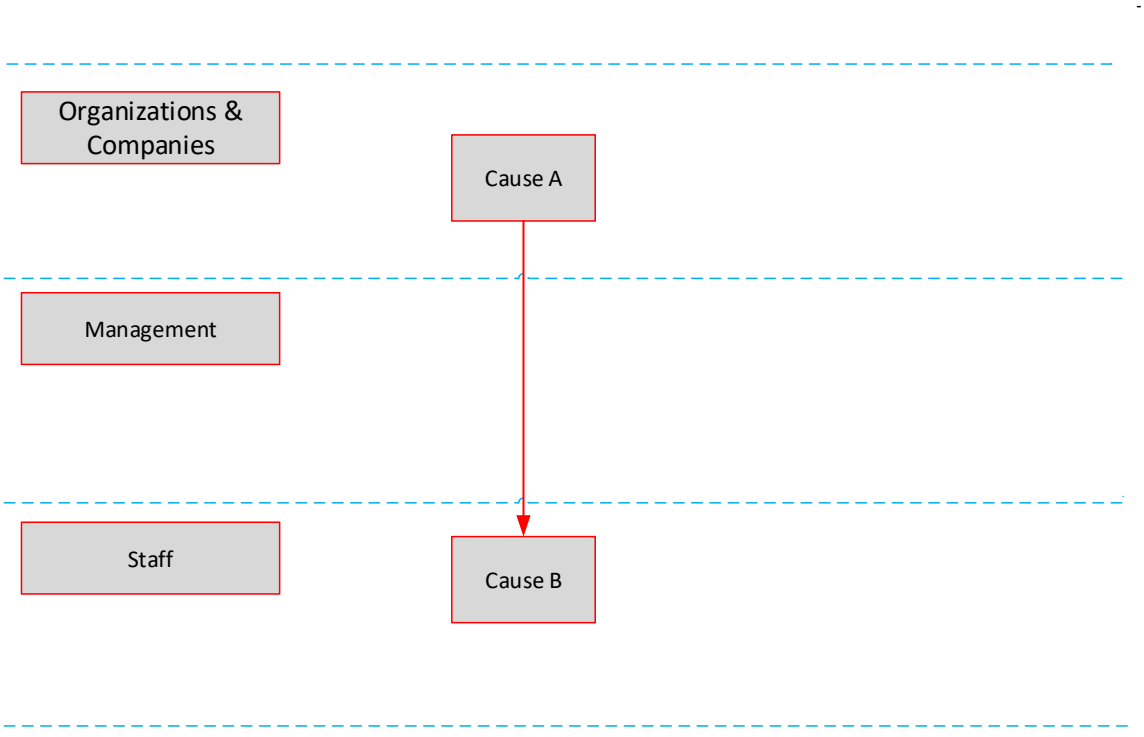
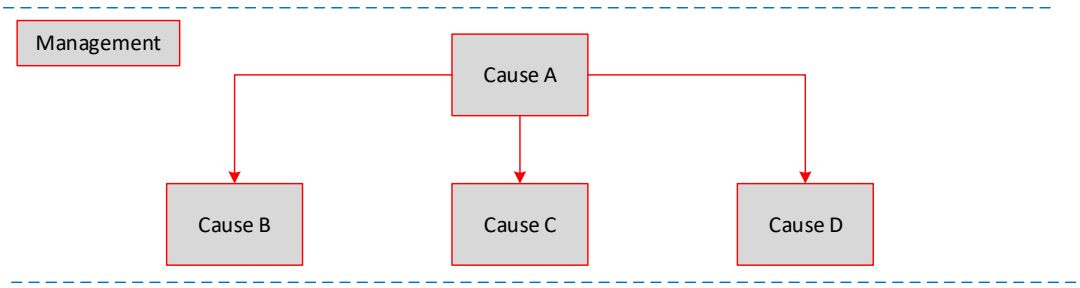


Figure 2.3: Explanatory diagram for cause-effect interaction in Rasmussen's framework

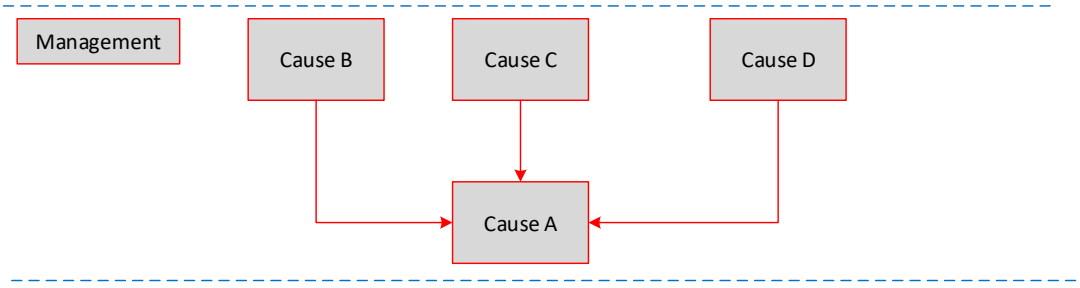
However, the contributory factors were arranged chronologically in the thesis, placing the early events first to the left of each layer, the next one to the right, and so on. So, this rule was not followed strictly, as the authors suggested, although for some causes it was possible to place then one below the other.

Some causes were necessary to link with more than one effect or some causes might be linked to one common effect. There is no need to repeat each time the linking process, as it can be done in the following example:



(a) Distributive Connections

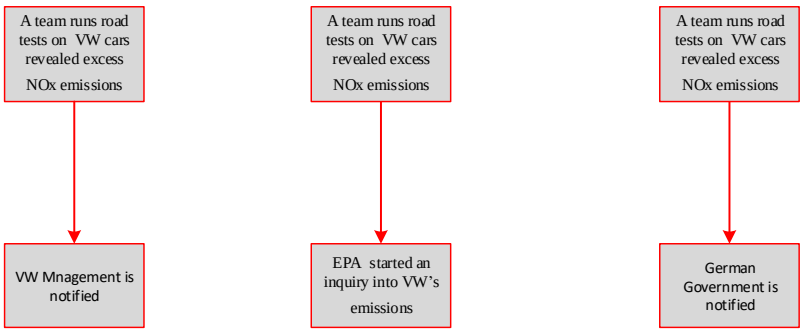
or,



(b) Accumulative Connections

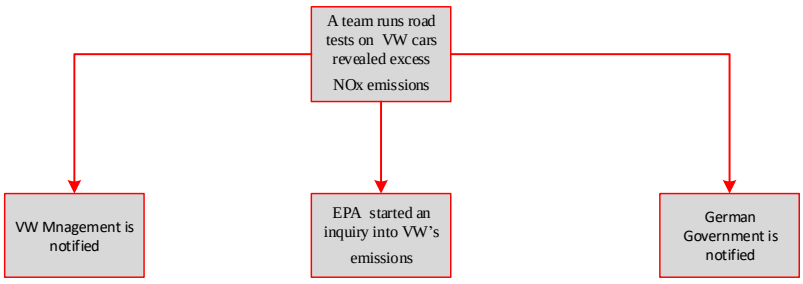
Figure 2.4: Connection types based on causal sequence

- **Step 7:** Fill in the gaps. Information may be missing in the causal chain, leaving gaps. These gaps must be filled since information referring to earlier events could be left out all the way down to the outcome. All the information relevant to the incident should be included. To find any missing causes, it is important to search at each cause on the Accimap and ask why it occurred. The aim is to follow each causal chain as far as possible. We must include as many (but only as many) factors as are necessary so that someone reading our Accimap will be able to understand the sequence of events and conditions without difficulty.
- **Step 8:** Check the causal logic. Go through each cause in the diagram and verify that, had it not occurred, the event(s) it is linked to (and the incident itself) would probably not have occurred. Go through each causal chain in the diagram and make sure that:
  - a) Anyone reading the Accimap will have no difficulty in making sense of the sequence of events.
  - b) No cause is listed more than once. If there are two or more similar causes, we try to combine them into one more general cause. For instance, the following causes:



(a) Distributive Connections

can be combined as follows, to simplify the diagram and to highlight the importance of the team's findings on VW cars.



(b) Accumulative Connections

Figure 2.5: Combination of Causes

- **Step 9:** Formulate safety recommendations. Review each of the causal factors in the Accimap and identify those which could potentially be changed, controlled, or compensated for so that a similar outcome could not occur again (Branford et al., 2009).

By implementing these nine steps, the Accimaps were constructed for each case.

2.5.2. Naming the six levels

As in a lot of Accimaps examples (Chassery et al., 2021b; Stanton et al., 2023) etc., the names of the layers are adapted to represent the case-specific nature of the Accident and encompass the interplay between the stakeholders involved (Branford et al., 2009; Rasmussen, 1997; Rasmussen & Svedung, 2000).

1. **Government & Authorities:** This level encompasses governmental bodies, enforcing authorities, and international organizations responsible for the overall governance and regulation frameworks.
2. **Regulators & Judiciary:** This includes regulatory agencies, legal bodies, and other entities that oversee and enforce, and interpret compliance with regulations.
3. **Organizations & Companies:** This level focuses on the corporate playing field, examining how organizations and companies operate within the competitive market environment. It considers the strategies, policies, and cultural norms that influence corporate behaviour and decision-making on that level.
4. **Management:** This examines the strategic and operational management practices within organizations, including the implementation of sustainability initiatives and compliance with regulations decision making and other pivotal behaviours.
5. **Staff:** This considers the behaviours and practices of individual employees within the organization, including how staff influenced the outcome through their actions and decisions.
6. **Outcomes:** The final level addresses the outcomes of greenwashing practices and their impact on public perception, including the response from consumers, investors, and the general public.

Another aspect to clarify is the renaming of the layers. The context of each case where the Accimap is used uses redefined layers to fit the circumstances of the system. This is evident where studies such as Tabibzadeh et al., 2017 and Hamim et al., 2020 where both the layer naming and the number of layers changes from the traditional 6. The flexibility of the Accimap is explored by both Baek et al., 2023 and Branford et al., 2009 where it is mentioned how the context of the cases analyzed, is relevant to naming and mapping the layers. In this case for example, ”Outcome” replaced ”Work” due to the need to address the consequences of the Greenwashing, rather than the general consequences on the environment, as defined by (Rasmussen, 1997).

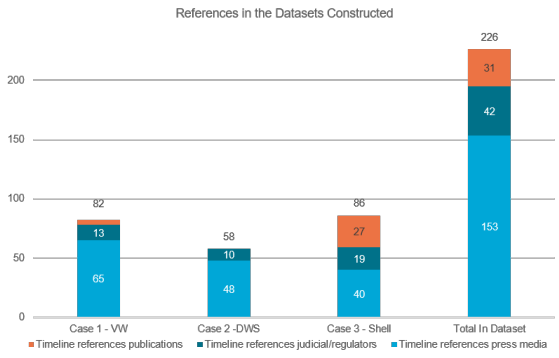
2.6. Methodology for formulating the Datasets

In this section, a brief explanation of the datasets created for each chapter will be given.

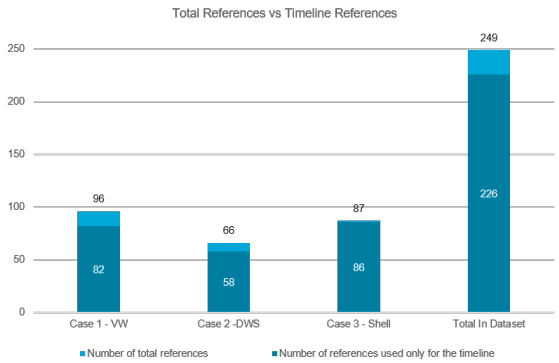
The data for each Accimap was gathered from online news sources and research that analyzed and documented each event. In accident analysis, it is crucial to fully understand the sequence of events that led to the incident. For the dataset, news reports, publications, and judicial documents were used to outline the events, and decisions were made based on this specific timeline.

2.6.1. Ascertaining validity in the datasets

In the present thesis, 226 references were used in total to validate the dataset and each event is triangulated with several reports, publications or judiciary documents to ascertain the dataset's reliability. The several categories described can be seen in Figure 2.6a with the three timelines constructed having over 50 individual references describing the events. The most popular category is Press/Media since they closely followed the scandals and documented updates on the individual situations throught the process. In total 153 news reports, 47 Judicial documents and 31 publications were referenced to create the timelines. Finally Figure 2.6b Indicates the Chapters' total references (theory or reference to methodology) vs timeline references.



(a) Reference Statistics by Category



(b) Reference Statistics in Total

Figure 2.6: Overall Chapters 3-5 Reference Statistics

2.7. Theoretical Background for Meta-Analysis

According to P. Salmon et al., 2020, one of Accimap's limitations was the absence of a classification scheme to support analysts in identifying and classifying contributory factors. This prevented the aggregation of data when the method was used to analyze multiple accidents. As a response to this, P. M. Salmon et al., 2020 developed a generic Accimap contributory factor classification scheme by combining contributory factors from 23 Accimap studies, published in peer-reviewed literature, all of which were carefully selected to fulfill the following criteria:

- The selected study involved an application of the Accimap method to analyze an accident or set of accidents, and
- Outcomes included documented accidents ranging from major events (large-scale nuclear disasters with global economic and environmental impacts) to relatively minor incidents (e.g., component failures, personal injury, exposure to hazardous substances).

The studies were excluded if they complied with the following criteria (P. M. Salmon et al., 2020):

- The study used Accimap to analyze work-as-done or near-miss incidents that did not involve an adverse outcome.

- The study involved only certain aspects associated with Accimap. Doing so changed the use of methods resulting in a hybridized approach.
- The study was reported in a conference or symposium presentation or paper, or industry report.
- The article was not published in English.

The study involved a review and synthesis of all the selected Accimap analyses published since 1997. The data extracted from each eligible article included: (i) authors; (ii) date of publication; (iii) domain; (iv) contributory factors; and (v) relationships between contributory factors. Each contributory factor was based on a thematic classification scheme. The classification scheme contained a total of 79 nodes across six Accimap levels and is generic in nature, so it can be applied to any domain (P. Salmon et al., 2020).

In total, 5,587 contributory factors were used from the 23 Accimaps and were subsequently coded to form the generic Accimap contributory factor classification scheme. Frequency counts of the contributory factors and relationships were performed, and the overall proportions as well as the proportions within each Accimap level were calculated. After completing the classification exercise, a relationship matrix cross-referencing 79 nodes was created to facilitate the modeling of aggregated relationships through network analysis, using a suitable qualitative software package (P. M. Salmon et al., 2020).

An inter-rater reliability analysis was conducted on the coding of contributory factors across five studies. In this process, a second analyst independently coded the contributory factors using the classification scheme. Percent agreement and Cohen's Kappa statistic were calculated to compare the coding between the two analysts. The results showed a high level of agreement across the five studies, with a percent agreement of 75.64% and a Kappa of 0.749 (95% CI: 0.68 to 0.81) (P. M. Salmon et al., 2020).

Particularly useful is Appendix A of Salmon et al.'s work (P. M. Salmon et al., 2020), as it tabulates a long list of contributory factor types and associated examples from Accimap studies. The researcher can search through the list and find the most suitable of the 79 factors, closest to the contributory factor under scrutiny. Examples and unique factors are given for each of the six Accimap levels.

The final contributory classification scheme is presented in Table 2.2.

Table 2.2: Generic Accimap Classification Scheme (P. M. Salmon et al., 2020)

Equipment, environment and surroundings	**Local area government, planning and budgeting & company management**
1	Animal, plant & biological hazards
2	Built environment & infrastructure
3	Equipment, technology & resources
4	Information & data
5	Noise & visibility
6	Other
7	Physical & natural environment
8	Time-related
9	Weather & climate
10	Work environment
11	Accident event
12	Activity, work & operations
13	Adverse events
14	Communication & coordination
15	Compliance with procedures, violations & unsafe acts
16	Delayed discovery & response
17	Equipment, technology & environment
18	Group & teamwork
19	Judgement & decision-making
20	Other
21	Personnel management & workloads
22	Physical & mental condition
23	Planning & preparation
24	Qualification, training, experience & competence
25	Risk assessment & management
26	Situation awareness

Continued on next page

Table 2.2 – continued from previous page

Equipment, environment and surroundings	**Local area government, planning and budgeting & company management**
27	Supervision & leadership
28	Time-related
29	Weather, climate & natural processes
30	Communication & coordination
31	Compliance with procedures, violations & unsafe acts
32	Culture
33	Equipment & environmental design
34	Financial pressures
35	Judgement & decision-making
36	Other
37	Personnel management & recruitment
38	Planning & preparation
39	Policy & procedures
40	Qualification, training, experience & competence
41	Risk assessment & management
42	Supervision
43	Time-related
44	Communication & coordination
45	Compliance with procedures, violations & unsafe acts
46	Culture
47	Financial pressures
48	Judgement & decision-making
49	Other
50	Personnel management & recruitment
51	Planning & preparation
52	Policy & procedures
53	Qualification, training, experience & competence
54	Risk assessment & management
55	Supervision
56	Time-related
57	Audits & inspections
58	Communication & coordination
59	Compliance with procedures, violations & unsafe acts
60	Culture
61	Financial pressures
62	Judgement & decision-making
63	Planning & preparation
64	Qualification, training, experience & competence
65	Regulatory structures & services
66	Risk assessment & management
67	Standards, policy & regulations
68	Time-related
69	Unclear roles & responsibilities
70	Action omitted & failure to act
71	Budget & finance
72	Communication & coordination
73	Culture
74	Judgement & decision-making
75	Policy, legislation & regulation
76	Political structures & services
77	Priorities
78	Qualification, training, experience & competence

Continued on next page

Table 2.2 – continued from previous page

Equipment, environment and surroundings	**Local area government, planning and budgeting & company management**
79	Supervision & enforcement

In Chapter 6, this methodology will be used to synthesize a meta-Accimap, out of the three Accimaps generated in Chapters 3-5. In their conclusion, the authors of the above method recommend using their method to build a multi-domain incident database and to explore similarities and differences across domains (P. Salmon et al., 2020; P. M. Salmon et al., 2020). The domain of greenwashing was not one of the domains explored so far using Rasmussen's framework and Accimap (Rasmussen, 1997), and naturally, it was not included in P. M. Salmon et al., 2020 analysis. It will be useful to examine how greenwashing fits in their analysis and compare the outcome of this thesis with the outcome of their work.

2.8. Chapter Conclusion

This Chapter encapsulates the rigorous theoretical background it's based on as well as the methodology followed. A major challenge in conducting a literature review was the limited availability of research encompassing the sociotechnical framing of Greenwashing. While there is a solid foundation for using safety science principles in corporate culture and decision-making, no research has extended to exploring greenwashing events as accidents or adverse effects through risk management frameworks. Research focuses more on defining greenwashing as well as its case-by-case manifestations. It was deemed paramount to share the methodology and the approach followed as these concepts will be heavily used throught the thesis and will be showcased in the respective chapters.

Chapter 3
The VW Greenwashing Scandal

3.1. Chapter Summary

As mentioned in Section 2.4.1 one of the most prolific examples of intentional greenwashing was the VW Emissions scandal. The ripple effects of the incident not only transformed the industry's outlook on tackling sustainability but also instigated a regulatory transformation on addressing greenwashing practices worldwide. This Chapter focuses on showcasing the dataset created for the VW case, and the various stakeholders that had a systemic role in facilitating this Green Fraud. In continuing from the previous chapters, the first Accimap is constructed showcasing the events and coding them accordingly. The timeline of events is also constructed and showcased and is used to build the stakeholder's map used for the Accimap. Additionally, the critical event timeline is more closely analyzed.

3.2. Timeline of events

The description that follows was based on the timeline of the events as drawn from various sources for the creation of the dataset, Table 3.1. The timeline of the main events of the greenwashing incident unfolded between 2015-2016, although the events started in 2006 and some legal issues have not been concluded until now. As mentioned the end of a greenwashing accident (incident) is considered the observed repercussions suffered by the company in question.

Table 3.1: Timeline of Events for the VW Emissions Scandal

Date	Events
2006	VW wants to increase its low market share in the USA as part of a plan to become the biggest car company in the world. To do this, it decided to use fuel-efficient diesel engines to compete with Toyota (Branding, 2015; Ewing, 2017d). VW Engineers warned that the new diesel engine could not meet U.S. EPA engine emission standards (Bomey, 2015; Ewing, 2017d).
2006	After failing to meet both EPA emission standards and internal design parameters, VW received assistance from Robert Bosch GmbH (Bosch)-the world's largest supplier of automotive parts and a frequent collaborator with VW (Boston, 2016; Ewing, 2017b; McGee, 2016)
Nov. 2006	At a meeting at company headquarters in Wolfsburg, Germany, executives decided to install illegal software that can detect when an emissions test is taking place and crank up pollution controls (Ewing, 2016c; Stanwick & Stanwick, 2017).
2009	VW started an advertisement campaign on clean diesel cars that presumably fulfilled the US emission standards (Ewing, 2011; Pemberton, 2015).
2009-2010	In two consecutive years two of VW's cars, i.e. VW Jetta Turbocharged Direct Injection, or TDI, and Audi A3 TDI, were awarded the 2009 and 2010 Green Car of the Year Award in the USA consecutively (Voelcker, 2009). However, after the outbreak of the scandal in 2015, Green Car Journal has rescinded these Green Car of the Year awards honouring the 2009 VW Jetta TDI and 2010 Audi A3 TDI diesel models (Fleming, 2015; Tragianis, 2015).
2011	VW begins selling Passat sedans made at a new, $1 bn factory in Chattanooga, Tennessee (Chattanoogan.com, 2008; Ewing, 2017d; Lawson, 2011).

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Table 3.1 – continued from previous page

Date	Events
2013	A team from West Virginia University won a $70,000 grant from the International Council on Clean Transportation (ICCT) to test whether diesel cars produced more emissions during normal driving than during laboratory tests. The original purpose of the research was to show that carmakers were capable of meeting more rigorous limits on emissions of harmful nitrogen oxides. Subsequent road tests revealed that two VWs in the study emitted far more NOx than allowed (Ewing, 2016a; Kimball, 2015).
2014	California Air Resources Board, or CARB, opened an inquiry into the excess VW emissions uncovered by the West Virginia study (Ewing, 2016a, 2017d).
May 2014	After publication of the West Virginia study, a VW employee (the Fireman) warned top managers in a memo that regulators may investigate whether the carmaker has been deploying an illegal “defeat device” (Ewing, 2016b, 2017c).
2014	VW staff tried to cover up the illegal software by feeding the regulators false and misleading data, the company later admits in its plea agreement (DOJ, 2017; Ewing, 2017d).
Aug. 2015	As regulators increased the pressure, VW employees destroyed thousands of potentially incriminating documents (DOJ, 2017; Mellor, 2017).
21 Aug. 2015	VW group representative admitted orally to the US regulators that VW had installed cheating software to some of its TDI models (DOJ, 2017; B. Zhang, Veijalainen, & Kotkov, 2016).
3 Sept. 2015	VW group officially admitted the existence of the cheating software during a conference call with EPA after the latter threatened to withdraw certificates of approval from 2016 model cars (CNBC, 2015; Stanwick & Stanwick, 2017).
18 Sep. 2015	EPA issued a notice of violation, informing VW AG, Audi AG and VW US group and ordered the recall of the cars (EPA, 2015; on Clean Transportation (ICCT), 2015).
20 Sept. 2015	CEO of VW group Martin Winterkorn issued an apology for cheating on the emission tests of the VW diesel cars, on a video (Muller, 2015; Rushe, 2015).
21 Sept. 2015	VW Canada launched stop-sale policy; the share value of VW group dropped by 23% after admitting diesel emission cheating (News, 2015; B. Zhang, Veijalainen, & Kotkov, 2016). 22nd January 2020. Volkswagen AG was charged with 60 counts of contravening the Canadian Environmental Protection Act, 1999. On 22 January 2020, Volkswagen pleaded guilty to all charges and was fined CA$196.5 million (T. C. Press, 2020; Shepardson, 2020).
21 Sept. 2015	In Frankfurt stock exchange, €15bn (£11bn) was lost off VW’s share price. The German government warned that the scandal jeopardized the reputation of the country’s entire car industry (Kollewe, 2015b; Rische & Farrel, 2015).
22 Sept. 2015	VW announced there were 11 million cars worldwide fitted with its defeat devices (Kollewe, 2015b; B. Zhang, Veijalainen, & Kotkov, 2016).
22 Sept. 2015	The European Union (EU) admitted that U.S. had tougher emissions tests than Europe, which was why it caught VW cheating (Stefanini, 2015).
23 Sept. 2015	Martin Winterkorn, CEO of VW resigned (Kollewe, 2015b; B. Zhang, Veijalainen, & Kotkov, 2016). German prosecutors launched an investigation on former VW CEO Winterkorn. German government officials assumed several damage control strategies to protect their auto industry, as German politicians regard themselves as protectors of the auto industry (Gude et al., 2015; Knight, 2017).
24 Sept. 2015	Dieselgate: how much did Merkel’s government know? (Barkin, 2015; Knight, 2017; Smith, 2015).
25 Sept. 2015	VW USA launched a webpage with information and the possibility to identify the affected vehicles and – later- to claim goodwill packages. The same day in the US, EPA started testing all light-duty diesel vehicles with a new procedure to detect cheating devices (Tools, 2015; B. Zhang, Veijalainen, & Kotkov, 2016).
26 Sept. 2015	Switzerland banned sales of VW diesel cars in the most severe step taken so far by the government in reaction to the emissions crisis. The Swiss authorities have also set up a task force to fully investigate the issue. (BBC, 2015a; Ruddick, 2015).

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Table 3.1 – continued from previous page

Date	Events
29 Sept. 2015	New CEO of VW group, Matthias Müller announces a refit plan for emission rigged vehicles (Paukert, 2015; B. Zhang, Veijalainen, & Kotkov, 2016).
3 Oct. 2015	VW has suspended the sale of some diesel cars in Australia while it addresses its emissions-cheating scam. In December 2019, VW was fined A$125m for making false and misleading representations about compliance with Australian diesel emissions standards (AFC, 2019; A. A. Press, 2015).
12 Oct. 2015	China's General Administration of Quality Supervision, Inspection and Quarantine announced the recall of 1.946 imported Tiguan SUVs and four imported Passat B6 sedans, in order to fix the emissions software problems (McDonald, 2015).
21 Oct. 2015	The German state of Lower Saxony filed a criminal complaint after a VW file disappeared (Kollewe, 2015b).
28 Oct. 2015	To persuade the big VW customers of their intentions to recover from the scandal, German Chancellor Angela Merkel took with her to an official trip to China the new VW CEO Müller, amid falling VW sales in China and efforts to boost profitability (ANE, 2015; Kollewe, 2015b; Rische & Farrel, 2015).
28 Oct. 2015	The emissions-rigging scandal pushed VW €3.5bn into the red, its first quarterly loss in 15 years (Kollewe, 2015a, 2015b).
2 Nov. 2015	EPA issued a second notice of violation of the Clean Air Act (CAA) to VW AG, Audi AG and VW Group of America, and ordered recall of cars with a 3.0L TDI engine for 2014-2016 models (U. EPA et al., 2015; B. Zhang, Veijalainen, & Kotkov, 2016).
9 Nov. 2015	Volkswagen offered $1,000 gift cards as "goodwill package' to US owners" (BBC, 2015b; Thielman, 2015).
26 Nov. 2015	In November 2015, in S. Korea after defeat devices had been found in some VW models, the environment minister issued a fine of $12,3m (Ji-hye, 2015; Jung-a, 2015).
2 Dec. 2015	VW took out a €20bn loan to help it survive the diesel emissions scandal (Davies, 2015; Schuetze & Cremer, 2016).
Dec. 2015	Consumer group with affected vehicles in the USA filed lawsuits asking for damages and repair costs (B. Zhang, Veijalainen, & Kotkov, 2016).
Sept. – Dec. 2015	Authorities in France (Kollewe & Ruddick, 2015), Italy (Kollewe & Ruddick, 2015), Spain (Román, 2015), Sweden (Anderson, 2015), S. Africa (Anderson, 2015; TZM, 2015), Romania (Neagu, 2015), Norway (Anderson, 2015), N. Zealand (Anderson, 2015), Netherlands (DutchNews, 2016), India (Anderson, 2015), Brazil (Matheus, 2015) and Belgium (Baert, 2016) launch investigations into the scandal, with varying financial claims against VW reaching their judiciaries.
2009-2015	The sales in the USA increased from 2% to 20%. The affected engine types were primarily EA189 (1.2L, 1.6L, 2.0L TDI versions) (Ewing, 2011)
2009-2015	From 2009 to 2015, it was estimated that the excess emissions caused 59 early deaths in the US (Barrett et al., 2015).
8 March 2017	VW emissions scandal not German government's fault, said Merkel(DW, 2017)

3.3. Deconstructing the VW Critical Event

Before we proceed with the discussion of the Accimap, we used Rasmussen's method (Rasmussen, 1997) to evaluate the critical event that led to the surfacing of the greenwashing incident, Figure 3.1. The event box represents the team of researchers from the West Virginia University who evaluated 3 cars for their exhaust emissions (Kimball, 2015). The selected 3 VW cars were evaluated both for their emissions on a stationary chassis dynamometer and on-road mode. When the 3 cars were tested on the chassis dynamometer, all 3 cars showed emissions within the legal limits. When the same cars were tested for on-road emissions, only one car had emissions within the legal limits, whereas the other 2 recorded much higher NO_x emissions than the legal limit. The 2 cars ought to have the same emission levels when run in both modes, with only very small deviations (Williams et al., 2018). However, the fact that the 2 cars had 15-40 times higher NO_x emissions (Kimball, 2015), led to further investigations by the EPA, which eventually led to the unravelling of the cheat software in 11 million cars all over the world, and the VW greenwashing. The Cause-Consequence-Chart

(CCC) constructed around the critical event is shown in Figure 3.1.

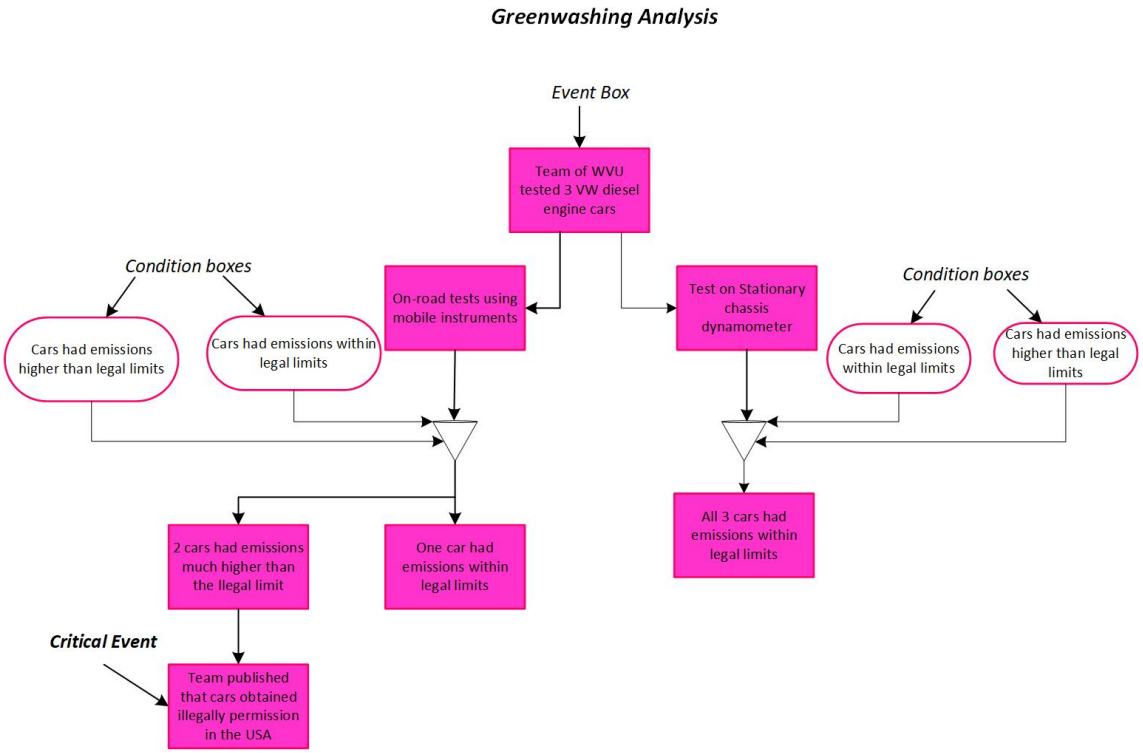

Figure 3.1: Cause-Consequence-Chart (CCC), illustrating the structure and the Critical Event unravelling the greenwashing of the VW "dieselgate"

3.4. Stakeholders map and actors in the VW Case

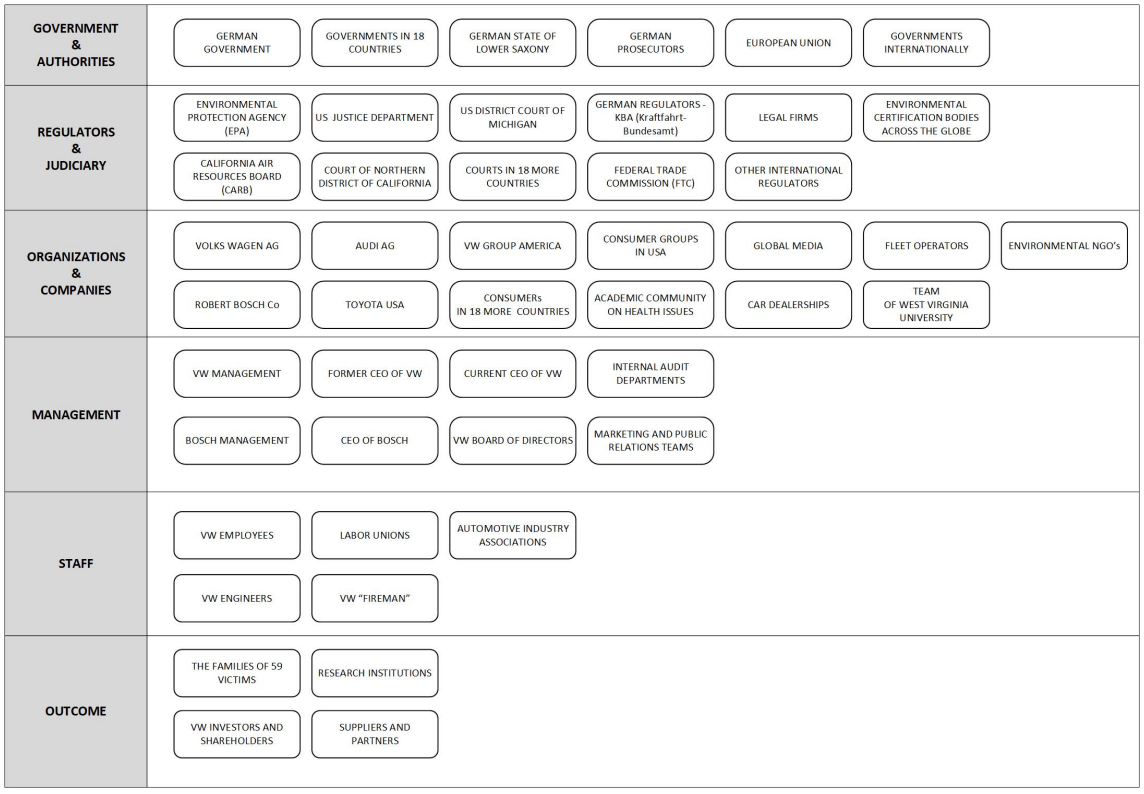

Figure 3.2: Stakeholders map for VW's greenwashing incident

Following the timeline of the events in Table 3.1, a Stakeholders map is created, which is used to identify the main actors in the VW incident. Figure 3.2 showcases the stakeholders in the USA and other parts of the world that were identified, as this incident was not only global in geographical terms, but had also global consequences, mainly – but not only- in financial terms(Anderson, 2015; Baert, 2016; Cremer, 2015; DutchNews, 2016; Kollewe & Ruddick, 2015; Matheus, 2015; Neagu, 2015; Román, 2015; TZM, 2015). The stakeholders were identified through the relevant literature and were distributed in the six system layers (Branford et al., 2009).

As a systems approach the stakeholders reside in all six levels of the framework. By examining the relevant literature, it was evidenced that there was shared responsibility, for example, between VW and Bosch management with VW's employees and engineers in building up this incident. Additionally, there was good vertical integration, for example, with the EPA or CARB and the USA Courts with VW and Bosch management after the incident was discovered. There was also good upward integration, such as between the team from West Virginia University, when they published their findings on VW's cars on on-road emissions, and then handed over the results to the EPA, where they first became aware of the peculiar behaviour of VW's cars on emissions (Kimball, 2015; Oehmke, 2017).

The various stakeholders listed are a direct consequence of the timeline of events in Table 3.1 and they correspond directly to the Accimap construction shown later.

3.5. The VW Accimap

For the drawing of the Accimap, the Stakeholder map was used, Figure 3.2. The Accimap developed in the present thesis consists of 6 main layers, Figure 3.3. The six layers of the framework are: Government & Authorities; Regulators & Judiciary; Organizations & Companies; Management; Staff and Outcome.

In order to construct the Accimap, we followed the nine steps proposed by Branford et al., 2009. Once the six layers were set, the next step was to identify the outcomes. By analyzing the relevant literature, the timeline of the events was established as drawn from various sources for the creation of the dataset, Table 3.1. The events took place mainly in the USA, although the repercussions echoed and affected many nations throughout the world (Anderson, 2015; Baert, 2016; Cremer, 2015; DutchNews, 2016; Kollewe & Ruddick, 2015; Matheus, 2015; Neagu, 2015; Román, 2015; TZM, 2015). The negative outcomes included very expensive fines from the US courts for the VW Co, the VW CEO and some of the VW staff, the Bosch Co, very expensive fines for damages for affected groups of USA citizens, and the appointment by the US judiciary of an independent monitor to oversee VW for three years. A jail sentence was given to one VW employee. Moreover, researchers estimated the health damages and human deaths caused by the extra emissions from the VW cars (Barrett et al., 2015). Damages and fines were also paid by VW to groups of VW car owners in many other countries worldwide, as millions of VW cars were affected worldwide (Anderson, 2015; Baert, 2016; Cremer, 2015; DutchNews, 2016; Kollewe & Ruddick, 2015; Matheus, 2015; Neagu, 2015; Román, 2015; TZM, 2015).

The next step was to identify the causal factors. By making a list of all causes in the incident data, that is, all factors for which you can say "Had this been otherwise, the incident would (probably) not have occurred," ten causal factors were identified:

1. VW management decided to increase its USA market share.
2. VW engineers realized cars could not meet US standards.
3. Robert Bosch Co was asked by VW to assist.
4. VW executives decided to use illegal software in VW cars.
5. In 2009 VW started a "clean diesel" massive marketing push in the USA.
6. VW cars won prizes in the USA as clean cars of the year.
7. Strong sales on the US market for the VW "Green Cars".
8. A team runs road tests on VW cars and reveals excess NOx emissions.
9. VW executives and engineers try to cover up the illegal software.
10. VW employees destroy thousands of incriminating documents.

The causal factors were assigned to three layers, i.e., Organizations & Companies, Management, and Staff. For all the causal factors, a short wording was kept, but long enough to explain the message it conveys. For each layer, there are nodes, starting from the left of the layer and going to the right. Each node is numbered with an initial letter L, for layer. The first number that follows designates the layer number, and the second number designates the node number. So, node number L3.2 designates level 3, node number 2.

All the 38 contributory factors identified were arranged chronologically in the Accimap, placing the early events first to the left of each layer, the next one to the right, and so on. Each node, together with the contributory factor, shows the date or year and the event that took place.

Three types of connecting lines between the nodes were used. A line ending in a vector at the receiving node signifies a message sent. A line starting with a vector pointing at the node signifies a message received. A line with bi-directional vectors signifies messages exchanged between two nodes. As an example, the way the nodes were arranged in the Accimap is described below (an enlarged version can be seen in figure A.3):

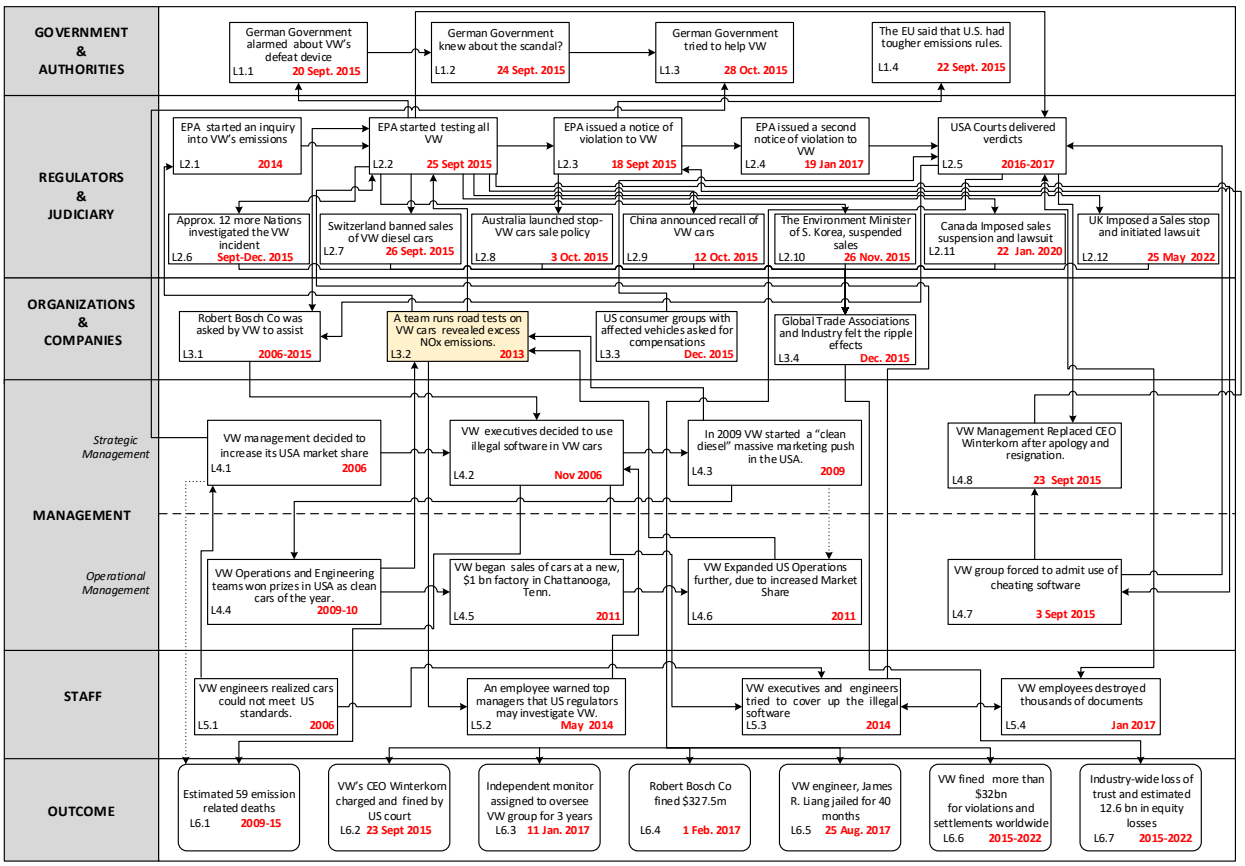

Figure 3.3: VW Accimap and influencing factors

The first causal factor is node L3.2, "A team runs road tests on VW cars revealing excess NOx emissions" (Keogh, 2015; Oehmke, 2017), which earlier was identified as the Critical Event, section 3.3. There are 3 incoming vectors connecting the causal factor with node L4.3, i.e., the team is notified in 2009 that VW started a "clean diesel" massive marketing push in the USA (Ewing, 2011; Pemberton, 2015). The second incoming vector from node L4.4 notifies the team about the prizes won by the "clean diesel cars" in the USA market (Fleming, 2015; Voelcker, 2009). The third connection with an incoming vector arrives from node L4.6, notifying in the year 2011 about the strong sales of VW cars in the USA market (Ewing, 2011). It was these 3 events that aroused the interest of the people in the ICCT to send the team to check the VW cars (Keogh, 2015). The critical event has three outgoing vectors, connecting to node L2.1, which represents the notification of the EPA to start their inquiries about the VW vehicles' emissions, a second vector to node L2.2 notifying the EPA to do their own testing of the VW vehicles, and a connection to a third node L5.2, which signifies that a VW employee, the "fireman," learns about an investigation on VW cars' emissions, and in turn, notifies the VW management (the CEO) (Ewing, 2016b, 2017c), node L4.1.

Following this example, the several coded events in the VW Accimap (Figure 3.3) can be seen in Table 3.2 with all the corresponding nodes being explained and documented with the relevant sources. The causal connections as mentioned in both Chapter 2 and section 3.5 are a product of the flow of events but also the influences from the various decision-making levels.

3.5.1. VW Accimap event codes and distribution

Table 3.2: Coded Table for VW Accimap

LAYER 1 GOVERNMENT & AUTHORITIES	
L1.1	20 September 2015. CEO of the VW Group Winterkorn confessed the cheating in the USA and offered a public apology, next day the Frankfurt stock exchange lost €15bn (£11bn) off VW's share price (Muller, 2015; Rushe, 2015). The German government warned that the scandal jeopardized the reputation of the country's entire car industry (Kollewe, 2015b; Rische & Farrel, 2015). Following the resignation of former VW CEO Winterkorn, German prosecutors launched an investigation on him (Ewing, 2017a; Treanor, 2015). German government officials assumed several damage control strategies to protect their auto industry, as German politicians regard themselves as protectors of the auto industry (Barkin, 2015; Gude et al., 2015; Knight, 2017). Top advisors to Foreign Ministry had written a confidential letter to German diplomats around the world, providing guidelines for how they should go about defending "the Germany brand." "The emissions scandal should be presented as a singular occurrence," they wrote. "External communication" should focus "to the extent possible on preventing VW and the 'Made in Germany' brand from being connected (Gude et al., 2015)."
L1.2	24 September 2015. The German Government, although it did not have any direct involvement in the VW incident in the USA officially, as the parent country of the VW group had a unique ethical place in the incident. Mr. Winterkorn and other top managers were used to deferential treatment by government officials in Germany, where it is one of the largest employers (Ewing, 2016c; Knight, 2017). Trying to answer the question on how much the German Government knew before the dieselgate appeared on the news, there was not much information available on the issue. According to some reports (Smith, 2015), the German government knew that the diesel engines sold by the country's biggest carmakers weren't as clean as they claimed as long ago as one year before the scandal appeared on the press in 2015. However, the then German Chancellor Angela Merkel told a parliamentary inquiry that she only learned of VW's diesel emissions scandal when it became public knowledge (DW, 2017).
L1.3	28 October 2015. To persuade the big VW customers for their intentions to recover from the scandal, German Chancellor Angela Merkel took with her to an official trip to China the new VW CEO Müller, amid falling VW sales in China and efforts to boost profitability (ANE, 2015; Rische & Farrel, 2015).
L1.4	22 September 2015. The EU admitted that U.S. has tougher emissions tests than Europe, which is why it caught VW cheating (Stefanini, 2015). In the EU, the European Commission sets emission standards. Car manufacturers then send their new cars to a national approval authority of their choosing and pay for the cost of testing the car's safety and emissions in a laboratory. Once certified, the car can be sent to a dealer anywhere in the block and is never tested again. In the U.S., cars can be subjected to tests, maximum three times. The first is certification, in which car companies carry out their own tests and send their results to the U.S. EPA. Next, the EPA picks 10 to 15 percent of all cars on the production line and tests them to confirm the maker's results. About 3 to 4 percent of new car models face a further level of testing. The EPA sends letters to owners asking them to volunteer their cars for in-service inspection (Stefanini, 2015).
LAYER 2 REGULATORS & JUDICIARY	
L2.1	In 2014 California Air Resources Board, or C.A.R.B., which is part of the EPA, opened an inquiry into the excess VW emissions uncovered by the study of the West Virginia University (Ewing, 2016a, 2017d).
L2.2	On the 25th September 2015, EPA started testing all light duty diesel vehicles with a new testing procedure to detect cheating devices (Tools, 2015; B. Zhang, Veijalainen, & Kotkov, 2016). Their results agreed with the findings of the West Virginia University (Oehmke, 2017). VW notified the EPA that it will recall about 38,000 of its vehicles for refitting, but the results of the refits were not encouraging (Release, 2014).

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Table 3.2 – continued from previous page

L2.3	On the 18th September 2015, EPA-CARB issued a notice of violation to VW and ordered recall 2009-2015 VW car models with 2.0L TDI engines and made the issue public. Public discussion on the Volkswagen scandal exploded; Volkswagen Group of America, Inc. announced an immediate stop-sale on new 4-cylinder TDI vehicles in dealer inventory (EPA, 2015).
L2.4	19 January 2017, EPA issued a second notice of violation (NOV) of the Clean Air Act (CAA) to Volkswagen AG, Audi AG and Volkswagen Group of America, as more branches from Volkswagen were found to have a similar cheating system on 3.0L TDI engine for 2014-2016 models (U. EPA et al., 2015; B. Zhang, Veijalainen, & Kotkov, 2016). EPA simultaneously notified the US Department of Justice, for their own actions.
L2.5	By 2016 -2017, the first court decisions dealing with civil complaints and consumer lawsuits were announced. The Court of Northern District of California ordered VW to pay $14.7 bn settlement for about 500,000 cars model year 2009 - 2015 VW and Audi light-duty vehicles, equipped with 2.0-liter TDI engines (of California, 2016). U.S. Department of Justice found former CEO of VW AG -Winterkorn (DOJ, 2018), five VW executives (DOJ, 2017) and two engineers (DOJ, 2017) guilty and charged them with conspiracy and fraud in diesel emissions scandal and ordered VW to pay $2.8bn criminal fine and $1.5bn settlement of civil environmental, customs and financial violations. Also, the court appointed an independent monitor to oversee the parent company for three years (DOJ, 2017). The District Court of Northern District of California, San Francisco Division ordered VW to pay a further $1.3bn to owners of Audi, Porsche and VW vehicles with 3-liter motors not covered by the earlier settlement (of California, 2017). The auto components maker Bosch agreed to pay $327.5 million to U.S. vehicle owners as compensation for its role in supplying the cheating software (Bosch, 2017; Ford, 2019). This brought the total cost of VW scandal in the USA to more than $20bn (McGee, 2017). Late August 2017, a longtime VW engineer, James Robert Liang, pleaded guilty in a United States court to conspiring to defraud regulators and car owners, and sentenced to 40 months (about 3 and a half years) imprisonment (of Public Affairs, 2017).
L2.6	Sept. – Dec. 2015. Authorities in France (Kollewe & Ruddick, 2015), Italy (Kollewe & Ruddick, 2015), Spain (Román, 2015), Sweden (Anderson, 2015; Cremer, 2015), S. Africa (Anderson, 2015; TZM, 2015), Romania (Neagu, 2015), Norway (Anderson, 2015), N. Zealand (Anderson, 2015), Netherlands (DutchNews, 2016), India (Anderson, 2015), Brazil (Matheus, 2015) and Belgium (Baert, 2016) launched investigations into the scandal, with varying financial claims against VW reaching their judiciaries.
L2.7	26th September 2015. Switzerland banned sales of VW diesel cars in the most severe step taken so far by a government in reaction to the emissions crisis. The Swiss authorities have also set up a task force to fully investigate the issue (BBC, 2015a; Ruddick, 2015).
L2.8	3rd October 2015. VW suspended the sale of some diesel cars in Australia while it addressed its emissions-cheating scam. In December 2019, VW was fined A$125m for making false and misleading representations about compliance with Australian diesel emissions standards (AFC, 2019; A. A. Press, 2015).
L2.9	12 October 2015. China's General Administration of Quality Supervision, Inspection and Quarantine announced the recall of 1,946 imported Tiguan SUVs and four imported Passat B6 sedans, to fix the emissions software problems (McDonald, 2015; Standard, 2015).
L2.10	On 26 November 2015, in S. Korea after defeat devices had been found in some VW models. The government confirmed that VW used software to manipulate emissions levels in cars sold in Korea and ordered a recall of over 120,000 vehicles. The Environment Ministry said it found the defeat device software working in the Volkswagen Tiguan Euro 5 equipped with the EA189 engine. It added it would expand the investigation into 15 other carmakers including Hyundai Motor and Kia Motors of South Korea, and European brands BMW and Mercedes-Benz. The ministry suspended the sales of unsold VW cars equipped with the same engine as the Tiguan Euro 5. It also imposed a penalty of $12,3m at VW (Ji-hye, 2015; Jung-a, 2015).

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L2.11	21 September 2015. VW Canada launched stop-sale policy; the share value of VW group dropped by 23% after admitting diesel emission cheating (News, 2015; B. Zhang, Veijalainen, & Kotkov, 2016). 22nd January 2020. Volkswagen AG was charged with 60 counts of contravening the Canadian Environmental Protection Act, 1999. On 22 January 2020, Volkswagen pleaded guilty to all charges and was fined CA$196.5 million (T. C. Press, 2020; Shepardson, 2020).
L2.12	26 September 2015. UK Vehicle Certification Agency to re-run lab tests and compare with ”real-world” driving emissions (BBC, 2015a). 25 May 2022. VW UK settled action claims from approx. 70,000 UK drivers, totaling £193m (de Prez, 2022).
LAYER 3 ORGANIZATIONS & COMPANIES	
L3.1	2006. After failing to meet both EPA emission standards and internal design parameters, VW asked and received assistance from Robert Bosch GmbH (Bosch)-the world's largest supplier of automotive parts and a frequent collaborator with VW (Boston, 2016). VW admitted to cheating on auto emissions tests when Martin Winterkorn, its chief executive, met with the head of supplier Robert Bosch GmbH to discuss the cars “illegal defeat device” software (Boston, 2016; Ewing, 2017b; McGee, 2016).
L3.2	In 2013, a team from West Virginia University won a $70,000 grant from the non-profit International Council on Clean Transportation (ICCT), to test whether VW diesel cars produced more emissions during normal driving than during laboratory tests (Oehmke, 2017). It all started when the European wing of the US NGO International Council on Clean Transportation (ICCT) set out to prove modern diesel were genuinely clean and would therefore be able to make a significant contribution to improving both CO2 emissions and air quality (Keogh, 2015). Road tests revealed that two VWs in the study emitted far more NOx than allowed (Ewing, 2016a; Kimball, 2015). This was identified in this study as the critical factor, which very soon unraveled the greenwashing incident.
L3.3	In December 2015, Consumer groups with affected vehicles in the USA filed lawsuits asking for damages and repair costs (B. Zhang, Veijalainen, & Kotkov, 2016). The results of the lawsuits in the US courts some years later, proved very costly and damaging not only for VW, but for the individuals with key roles in the greenwashing.
L3.4	Sept-Nov 2015. Competitors (suppliers) overall suffered 18.3 (12.6) billion euros of abnormal losses during this time, with 60% (69%) of the firms exhibiting negative changes, especially European competitors and suppliers connected to Volkswagen (Barth et al., 2022; Vaccarino, 2015).
LAYER 4 MANAGEMENT	
L4.1	In 2006, VW wanted to increase its low market share in the USA as part of a plan to become the biggest car company in the world. To do this, it decided to use fuel-efficient diesel engines to compete with Toyota (Branding, 2015; Ewing, 2017d).
L4.2	November 2006. At a meeting at company headquarters in Wolfsburg, Germany, executives decided to install illegal software that could detect when an emissions test was taking place and cranked up pollution controls, as witnessed by people who saw a PowerPoint presentation laying out details of the plan. The rest of the time the controls are throttled back to protect engine components from wear and tear. VW executives rejected recommendations to improve the existing emissions equipment in order to satisfy the stringent USA regulations even though they knew that the VW vehicles were releasing more emissions than EPA regulations allowed. The existing emissions equipment could have been calibrated to meet the regulatory standards of the US, but it would result in the equipment quickly wearing out (Ewing, 2016c; Stanwick & Stanwick, 2017).
L4.3	In 2009, VW started a massive campaign to promote “clean diesel” cars in North America. The VW's Vice President (VP) of marketing termed the campaign “Truth & Dare” effort, which was about “debunking the myths on clean diesel and fueling the passion of existing diesel owners (Pemberton, 2015).” Audi, also owned by VW, campaigned with the slogan “Diesel, no longer a dirty word (Pemberton, 2015).” The aim of VW was to leave behind its low market share of 2% sales in the US car industry in 2006 and become a leader in the competition with the Japanese and Korean manufacturers that have nearly driven it out of the U.S. market (Ewing, 2011).

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L4.4	2009-2010. In two consecutive years two of VW's cars, i.e. VW Jetta TDI and Audi A3 TDI, were awarded the 2009 and 2010 Green Car of the Year Award in the USA consecutively (Voelcker, 2009). However, after the emergence of the scandal in 2015, Green Car Journal has rescinded these Green Car of the Year awards honouring the 2009 VW Jetta TDI and 2010 Audi A3 TDI diesel models (Fleming, 2015; Tragianis, 2015).
L4.5	2011. VW begins selling Passat sedans made at a new, $1 bn factory in Chattanooga, Tenn (Ewing, 2017d).
L4.6	2011. The VW car sales in the USA increased from 2% and its respective market share grew to the point of a possible expansion studied by the University of Tennessee, which asserted up to 9,800 new jobs. The study has been removed since; however, it illustrated the growth potential indicated along with the deception (Ewing, 2011; Fox & Haag, 2015).
L4.7	3 Sept. 2015. VW group admitted officially the existence of the cheating software during a conference call with EPA, after EPA threatened to withdraw certificates from 2016 models (CNBC, 2015; Stanwick & Stanwick, 2017).
L4.8	20 Sept. 2015. CEO of VW group Martin Winterkorn issued an apology for cheating during the emission tests on a video, adding the company was fully co-operating with the relevant agencies (Muller, 2015; Rushe, 2015). He resigned on the 23rd of September 2015 (Kollewe, 2015b; B. Zhang, Veijalainen, & Kotkov, 2016).
LAYER 5 STAFF	
L5.1	2006. VW engineers realized that the new diesel engines couldn't meet U.S. EPA engine emission standards (Bomey, 2015; Ewing, 2017d).
L5.2	May 2014. After the publication of the West Virginia study, a VW employee warned top managers in a memo that US regulators may investigate whether the carmaker has been deploying an illegal "defeat device" (Ewing, 2016b, 2017c). The VW employee was Mr. Gottweis, a quality-control expert, known as "the fireman" for his troubleshooting skills. When a defect turned up in VW vehicles somewhere in the world, usually he was the first on the scene. He wrote a memo in May 2014, suggesting that top levels of management learned of illegal software much sooner than VW admitted. In the memo, he warned that a study by researchers at West Virginia University revealed excess NOx emissions by VW diesel cars in the USA. Regulators might investigate whether VW was using a defeat device. The warning was put for weekend reading for Mr. Winterkorn, among other papers. VW said it was not certain that the CEO read it, but Mr. Winterkorn usually doesn't ignore memos from Mr. Gottweis (Ewing, 2016b, 2017c).
L5.3	2014. VW executives and engineers try to cover up the illegal software by feeding the regulators false and misleading data, the company later admits in its plea agreement (DOJ, 2017; Ewing, 2017d).
L5.4	January 2017. A paper appeared at the US District Court in Michigan, where VW staff were involved when VW's lawyers asked to preserve all the documents relating to the issue of the cheat software in the cars. This was misinterpreted as a signal to destroy every incriminating document relating to this issue. Both executives and staff have been reported to destroy documents (DOJ, 2017; Mellor, 2017). At one stage in September 2015, a supervisor in the VW engine development department addressed a meeting "of between 30 and 40 employees" who were told that any new documents created regarding the issue, "because they could be harmful to VW" should be saved to USB drives and only saved to the VW system "if necessary". Later, in a court settlement it said that thousands of documents were destroyed by about 40 employees of VW and Audi although once the investigation started, VW was able to recover many of the deleted documents (Mellor, 2017).
LAYER 6 OUTCOME	
L6.1	From 2009 to 2015, it was estimated that the excess emissions caused 59 early deaths in the US (Barrett et al., 2015). Another study found that approximately 9m fraudulent VW cars, as sold in Europe and the US, emitted a cumulative amount of 526 ktonnes of NOx more than was legally allowed. These fraudulent emissions were associated with 45 thousand disability-adjusted life years (DALYs) and a value of life loss of at least 39 bn US dollars (Oldenkamp, Zelm, & Huijbregts, 2016). (One DALY is defined as the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost to due to premature mortality and the years lived with a disability due to prevalent cases of the disease or health condition in a population.) (WHO, 2020).

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L6.2	Former CEO of VW group Martin Winterkorn, issued an apology for cheating during the emission tests on a video (Muller, 2015; Rushe, 2015), and subsequently resigned because of this (Kollewe, 2015b; B. Zhang, Veijalainen, & Kotkov, 2016). Ex-CEO of VW group, admitted to the authorities and the public, that his "company's products are not environmentally sound", as he claimed for many years through his company's campaign.
L6.3	The court appointed an independent monitor to oversee the parent VW company for three years (DOJ, 2017). The court's justification was that VW pleaded guilty to participating in a conspiracy to defraud the U.S. and VW's U.S. customers and to violate the Clean Air Act by lying and misleading the EPA and U.S. customers about whether certain VW, Audi and Porsche branded diesel vehicles complied with U.S. emissions standards, using cheating software to circumvent the U.S. testing process and concealing material facts about its cheating from U.S. regulators. VW was also charged with obstruction of justice for destroying documents related to the scheme, and with a separate crime of importing these cars into the U.S. by means of false statements about the vehicles' compliance with emissions limits. For these reasons, VW would be under an independent corporate compliance monitor who would oversee the company for at least three years (DOJ, 2017).
L6.4	1 February 2017. The auto components maker Bosch agreed to pay $327.5 m (approx. €304 m) to U.S. vehicle owners as compensation for its role in supplying the cheating software (Bosch, 2017; Ford, 2019). The settlement agreement concerned VW, Audi and Porsche diesel vehicles that were sold in the U.S.
L6.5	25 August 2017. A VW engineer, Mr. James Robert Liang, 63, pleaded guilty to conspiring to defraud the U.S., commit wire fraud and violate the Clean Air Act. He was sentenced by a U.S. Eastern District court of Michigan to 40 months in federal prison, and two years of supervised release, for his role in a nearly 10-year conspiracy to defraud U.S. regulators and VW customers by implementing software specifically designed to cheat emissions tests in hundreds of thousands of VW "clean diesel" vehicles sold in the U.S. (of Public Affairs, 2017).
L6.6	23 January 2020. The VW scandal triggered a global backlash against diesel vehicles that has by 2020 costed the company €30 billion in fines, penalties and buyback costs (Shepardson, 2020).
L6.7	Market sentiment industry-wide feared stronger and more stringent enforcement of environmental regulations affecting all global car producers, suppliers, and third parties. The spillover effects at the time showcased the far-reaching repercussions individual actors can have for the industry (Barth et al., 2022; Vaccarino, 2015).

3.6. Chapter Discussion & Conclusions

The development of the Accimap for this greenwashing incident followed a similar path used in the case of an accident. As in accidents, where many factors and players lead to an accident, similarly in greenwashing, it is not the case of one event or actor, but their interaction. The development of the Accimap model helps in our understanding of the inter-relating issues, developed in the incident of the VW. The placing of the events of the incident timeline at different layers is a first step of differentiating the events, according to groups of people or playmakers with distinct roles or duties. This avoids blaming for the greenwashing only some of the front people at the 5th level of the Accimap, as the former CEO of VW group Martin Winterkorn suggested saying that the misconduct was a result of "the grave errors of very few" employees (Ewing, 2015).

A point of importance for the "birth" of the VW greenwashing happened at the beginning of 2000, when VW was only a minor player in the USA car market, with a sales' share of about 2% (Ewing, 2011), layer 4. VW's CEO Winterkorn wanted his company to become a leader in car sales, in a USA market that nearly drove VW out of it (Ewing, 2011). In this effort, the management of VW was assisted by some of VW's engineers who helped develop and install the necessary illegal software (DOJ, 2017; of Public Affairs, 2017) and of course by Bosch who gave him the necessary software and hardware to fit in 11m cars, sold all over the world (Bosch, 2017; Ford, 2019). The important conclusion from the integration of some events placed on the Accimap model, is that the VW greenwashing was generated by the strong driving force of the former CEO of VW group Martin Winterkorn, layer 4, who wanted his company to become a big player and a sales leader in the USA market (Ewing, 2011).

Moreover, an email from a Bosch employee on June 23, 2008, revealed that Bosch was concerned about getting caught for assisting VW with the cheating software, but suggested it could help VW rig engines to recognize when they were being tested by enhancing the "acoustic function" (Boston, 2016; Ewing, 2017b).

(That was an internal code name for the defeat device, used by VW and Bosch engineers (Ewing, 2017b).) According to lawyers for U.S. owners of polluting VW diesel vehicles, the Robert Bosch GmbH (Bosch) was a "knowing and active participant" in a decade-long scheme by Volkswagen AG to evade U.S. emissions laws (B. Zhang, Veijalainen, & Kotkov, 2016).

Furthermore, VW's public relations department advertised strongly the "green cars," with VW's Vice President (VP) of marketing in charge of the campaign (Pemberton, 2015). So, according to our Accimap model, VW's incident wasn't something created by an individual, but there were many actors involved, and acting for many years in this incident, who knew very well what they were doing was wrong and unlawful. Therefore, the implementation of the VW incident was a team effort, involving the VW former CEO, the VW management, some VW staff and engineers, and of course the management and engineers from Bosch.

On the other hand, the reason they were caught in the USA, while many other affected countries failed to identify this incident for years, raises important points. The EU tried to answer this question by stating that U.S. has tougher emissions tests than Europe (Stefanini, 2015), layer 1. This is partly true. The US EPA has stricter emissions standards for cars, but this is not the issue here. The issue is that VW's defeat device was identified only when on-road tests were carried out, and their results were compared with the emissions in static mode (Kimball, 2015). This was a very clever move by VW's engineers who devised the cheat software (DOJ, 2017; of Public Affairs, 2017), which has not received much attention. To the best of our knowledge, practically every nation in the world, before it issues a pass certificate for emissions in specimen cars, requires results from static chassis dynamometer tests, simulating the driving on the real road (EPA, n.d.; Yang et al., 2018). No country requires tests for on-road emissions. While the technology to test cars under road conditions is available, it is not widely used by regulators (Ewing, 2016c). Official laboratory testing is performed on fixed trips and fixed conditions. The advantage of this is the good results and repeatability of testing vehicles. However, it has been shown that these testing conditions poorly reflect real-world driving, where emissions are much higher (Commission, 2024a). It was this knowledge the VW engineers used to their advantage. The on-road test was carried out by researchers from West Virginia University who won a $70,000 grant from the ICCT (Kimball, 2015), which is a Non-Government Organization (NGO). Thus, the USA caught VW, not by actions of some Government Office, but by a private entity. This also explains why no nation was legally obliged to do anything beyond what they already did, i.e., issue certificates to cars tested in a static environment. Because there is no legislation in place for on-road measurements, for car emissions. This also showcases that a direct systemic factor was the lack of proper tests being implemented in measuring the emissions, but also a broader lack of consistency in regulation across the globe. The US may have penalized VW under the pretence of fraud, but a deeper issue of rigorosity in testing and in framing "green cars" is issued, with the rest of the world still catching up.

Another aspect which comes out of the Accimap was the poor German Government reaction, before or after the greenwashing incident. VW, as a multinational company, operated all over the world. No single Government was responsible for the VW Group. Each country allowed the companies to operate on their grounds according to their own legislation. Until recently, most countries had limited or no legislation on greenwashing (File, 2023). The European Union in 2019 put in place legislation on greenwashing (Commission, 2022). The German Government can be considered "more responsible than others," primarily from an ethical standpoint. Its role in the scandal was characterized by a focus on protecting the well-being of the German industry above all else, rather than penalizing those at fault or supporting the many people affected by the scandal (Barkin, 2015; Taebi & Safari, 2017). VW played with the different legislations in many countries, trying to avoid paying penalties, rather successfully (Anderson, 2015; Baert, 2016; Cremer, 2015; DutchNews, 2016; Ji-hye, 2015; Kollewe & Ruddick, 2015; Matheus, 2015; Neagu, 2015; Román, 2015; TZM, 2015). As a result, the only significant penalties VW faced were in the USA (R. Business, 2016; di Rattalma, 2021; Mardo, 2017).

Chapter 4
The DWS misleading ESG claims

4.1. Chapter Summary

The DWS scandal, as discussed in 2.4.2, was a prominent ”greenwashing” incident involving Deutsche Bank’s asset management division. This controversy arose amidst the broader turmoil affecting its parent company, Deutsche Bank (AFP, 2015). Facing a 7 billion loss in 2015 restructuring efforts ensued to position DB for a turnaround. In this chapter, the objective is to create an Accimap framework for the DWS greenwashing incident. This is the second greenwashing incident, and as described by German reporters, the second major incident involving a German company, after the VW dieselgate (Bartz, 2021). DWS was founded in Hamburg in 1956 as “Deutsche Gesellschaft für Wertpapiersparen mbH” (German Enterprise for Securities Savings); the name was later shortened to DWS, ”Die Wertpapier Spezialisten” (The Fund Specialists) (Wikiwand, 2024). Similar to the case of Chapter 3, the chronological order is established, the critical event is analyzed in detail, the actors’ map is showcased and finally the Accimap is constructed from the relevant information. Finally, the conclusions and discussion of the DWS case as well as the systemic influencing factors are presented.

4.2. Timeline of events for The DWS Case

The description that follows is based on the timeline of the events, Table 4.1, and they unfolded mainly between the years 2020-2022. The dataset was constructed in similar fashion to Chapter 3 and the method analyzed in Chapter 2.

Table 4.1: Timeline of Events for the Greenwashing of the DWS-Deutsche Bank

Date	Events
1956	DWS was founded in Hamburg in 1956 as “Deutsche Gesellschaft für Wertpapiersparen mbH” (German Enterprise for Securities Savings), the name was later shortened to DWS, ”Die Wertpapier Spezialisten” (The Fund Specialists) (ABC, n.d.; Wikiwand, 2024).
2004	Deutsche Bank assumed full ownership of DWS (Bank, 2004; Sims & Orosz, 2023).
March 2018	DWS shares debut after Deutsche Bank sells a minority stake in the division, part of an overhaul to help the bank move on from a string of lawsuits and trading scandals (Sims & Orosz, 2023; Strasburg, 2018).
Sept. 2018	DWS published a report called “Responsible Investing”, saying it has a sustainability history of two decades (DWS, 2018b; Sims & Orosz, 2023).
Oct. 2018	Woehrmann is appointed CEO, having spent years at DWS and Deutsche Bank (DWS, 2018a; Media, 2018; Sims & Orosz, 2023).
May 2020	DWS showcases its sustainable investment credentials, saying it will use artificial intelligence to identify companies with climate risks (DWS, 2020; Sims & Orosz, 2023).
June 2020	Desiree Fixler joins DWS as group sustainability officer (Albuquerque, 2020; Segal, 2020; Sims & Orosz, 2023).
8 Jan. 2021	DB signs a Deferred Prosecution Agreement (“DPA”) with the US Department of Justice (of Justice, 2021a).
March 2021	In March 2021 Desiree Fixler made a presentation to the executive board of DWS saying the firm had no clear ambition or strategy, lacked policies on coal and other topics. She also called for urgent and profound changes (Bartz, 2021; Kowsmann & Brown, 2021; Shazar, 2021).

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Date	Events
March 2021	DWS at the end of March sent an internal memo from CEO Wöhrmann to the Bloomberg news agency, announcing the dismissal of Desiree Fixler and claiming that she had not pushed the ESG agenda enough. The acronym stands for Environmental, Social and Governance, and refers to investments in companies that operate in an environmentally and socially sustainable manner and which are well managed and appropriately monitored by their supervisory boards (Bartz, 2021; de Paoli, 2021; Märkl & Kirakosian, 2021).
March 2021	DWS' supervisory board, headed by Deutsche Bank's Karl von Rohr, learns about Fixler's allegations and launches a review (Heath & Fischer, 2022; Sims & Orosz, 2023; von Rohr, 2022).
11 March 2021	Desiree Fixler is fired from DWS and files an unfair dismissal case against DWS in a labour court in Germany (Bartz, 2021; Kirakosian, 2022).
July 2021	Karl von Rohr and DWS' supervisory board finds no evidence to back up Fixler's allegations and decides not to pursue it further (Bartz, 2021; Sims & Orosz, 2023; von Rohr, 2022).
26 Aug. 2021	Media report the U.S. Securities and Exchange Commission is investigating DWS over how it used sustainable investing criteria to manage its assets. Shares fell 13.6%. DWS firmly rejects the allegations. Germany's financial regulator BaFin is also investigating (de Paoli, 2021; Miller et al., 2021).
Sept.-Dec. 2021	DWS' supervisory board creates a subcommittee to deal with the allegations (Sims & Orosz, 2023; von Rohr, 2022).
Nov.-Dec. 2021	Woehrmann receives threatening letters. Frankfurt police investigate (Sims & Siebelt, 2022a, 2022b).
Mid-Jan. 2022	Prosecutors in Frankfurt begin investigating investor fraud (Kötschau, 2022; Sims & Orosz, 2023).
24 Jan. 2022	A German labour court in Frankfurt dismissed Desiree Fixler's lawsuit against asset management firm DWS (Matussek & Arons, 2022; Rezmer & Votsmeier, 2022).
27 Jan. 2022	Woehrmann tells analysts: "I emphatically reject all these allegations and insinuations." Deutsche Bank conducts an internal investigation into Woehrmann's possible private email usage for business purposes (Sims & Orosz, 2023).
28 Jan. 2022	The European Central Bank is looking into corporate governance issues surrounding Woehrmann (Andrew, 2022; Sims & Siebelt, 2022c).
28 Feb. 2022	Deutsche Bank agrees with the U.S. Department of Justice to extend the stay of a special monitor for one more year, i.e. February 2023 (Jaeger, 2022; Kowsmann & Michaels, 2022; Sims & Prentice, 2022).
31 May 2022	Prosecutors and other officials raided DWS and Deutsche Bank. Prosecutors said they are following up on news reports and the whistleblower's claims and gather "sufficient factual evidence" (Axelsson, 2022; Gordon, 2022; Murray & Sims, 2022; Palmer, 2022).
1 June 2022	CEO Woermann announces he will step down the following week (Axelsson, 2022; Gordon, 2022; Langley & Miller, 2022).
9 June 2022	DWS annual general meeting, where Woehrmann underscores that DWS increased 2021 revenues by 22% and net profit by 40%. Stefan Hoops takes over as CEO (Sims & Orosz, 2022, 2023).
24 Oct. 2022	A German consumer group sues DWS for allegedly misrepresenting a fund's green credentials in marketing materials. In March 2023 they resolve the issue out of court (Ennis, 2022; Kaminski, 2023; Sims & Orosz, 2023).
18 April 2023	Karl von Rohr says he will step down as chair in October (Sims & Orosz, 2023).
14 June 2023	Greenpeace activists scale Deutsche's headquarters and string up a banner to protest climate investment policies at the bank and DWS (Sims & Orosz, 2023; T. B. Times, 2023).
7 July 2023	German prosecutors are investigating Woehrmann over allegations of investment fraud (Sims & Heine, 2023; Sims & Orosz, 2023).

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Date	Events
25 Sept. 2023	Deutsche Bank Subsidiary DWS to Pay $25 Million for Anti-Money Laundering Violations and Misstatements Regarding ESG Investments (Securities & Commission, 2023; Sun, 2023).
24 Jan. 2024	Raid on DWS due to suspicions of greenwashing (Arons, 2024; Sims, 2024).

4.3. The DWS Critical Event Path

The critical event in the DWS incident in 2021 evolved around the newly recruited sustainability officer of DWS, Desiree Fixler (Segal, 2020). When Fixler was first appointed to DWS on 25 June 2020, CEO Woehrmann explained to the press: “The appointment of our GSO is a huge step for us in creating a holistic approach to ESG at DWS. We are delighted to have Desiree on board to drive our sustainability strategy forward” (Albuquerque, 2020). A few months later, in March 2021, Fixler made a presentation to the executive board of DWS stating: “the firm had no clear ambition or strategy, lacked policies on coal and other topics and that ESG teams were seen as specialists rather than being an integral part of the decision-making” (Kowsmann & Brown, 2021). Basically, Fixler said to the Board members of DWS that the holistic approach to ESG in DWS was not there, and steps should be taken to close the gap.

According to the press reports, the events that followed were beyond her control. Ms. Fixler was fired by CEO Wehrmann on 11 March, one day before the annual report was released (Shazar, 2021). On 24 March 2021, CEO Wehrmann announced to Bloomberg that DWS “has dismissed its group sustainability officer after just six months, suggesting progress was too slow” (de Paoli, 2021). According to Fixler, DWS misrepresented its ESG capabilities, since only a small fraction of the investment platform applied ESG integration, adding there is no quantifiable or verifiable ESG integration for key asset classes at DWS (Shazar, 2021). She said proposals for change and objections she made to the annual report before publication, including how many assets were under ESG integration, were never included. She said she was fired because she talked about DWS’s problems and has filed an unfair dismissal case against DWS in a labor court in Germany (Kowsmann & Brown, 2021).

By August 2021, the U.S. Securities and Exchange Commission (SEC) was investigating DWS over how it used sustainable investing criteria to manage its assets. CEO Wehrmann was forced to resign on 9 June 2022 (Sims & Orosz, 2022). On 23 September 2023, DWS was fined by the US SEC $25 million for anti-money laundering violations and misstatements regarding ESG investments (Securities & Commission, 2023; Sun, 2023). From the above, it becomes evident that the critical event occurred when Ms. Fixler talked to the WSJ and explained the reasons for being fired by CEO Wehrmann. This is after the critical events’ occurence and can be seen in figure 4.3.

The Cause-Consequence-Chart (CCC) around the critical event is shown in Figure 4.1.

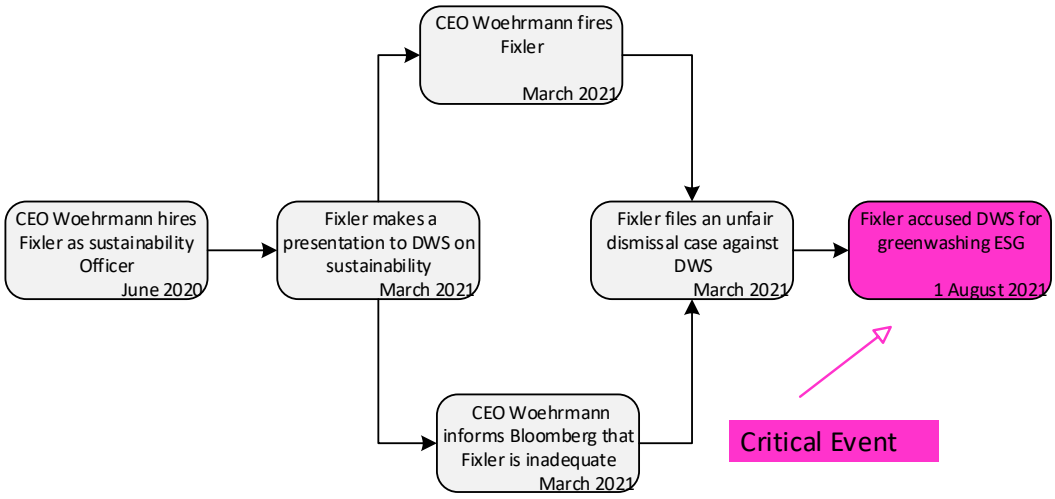

Figure 4.1: Cause-Consequence-Chart (CCC) for the DWS ESG misleading claims”

The pivotal point leading up to the critical event was the decision of the then-acting CEO Woehrmann to

release an internal memo to Bloomberg over Fixler's inadequacy. While the reason for doing that is not clear, it led directly to media attention that contributed to the the greenwashing accusation.

4.4. Stakeholders map for the DWS Case

The stakeholders are represented across all six layers of the map, which substantiates the adequacy of the systems approach in describing the incident. Additionally, the presence of multiple stakeholders across these layers underscores the complexity of the incident (P. M. Salmon et al., 2020). Notably, a significant concentration of stakeholders is observed in the first two layers. This contrasts with typical Accimap analyses of accidents, where the initial layers are usually sparsely populated (P. M. Salmon et al., 2020).

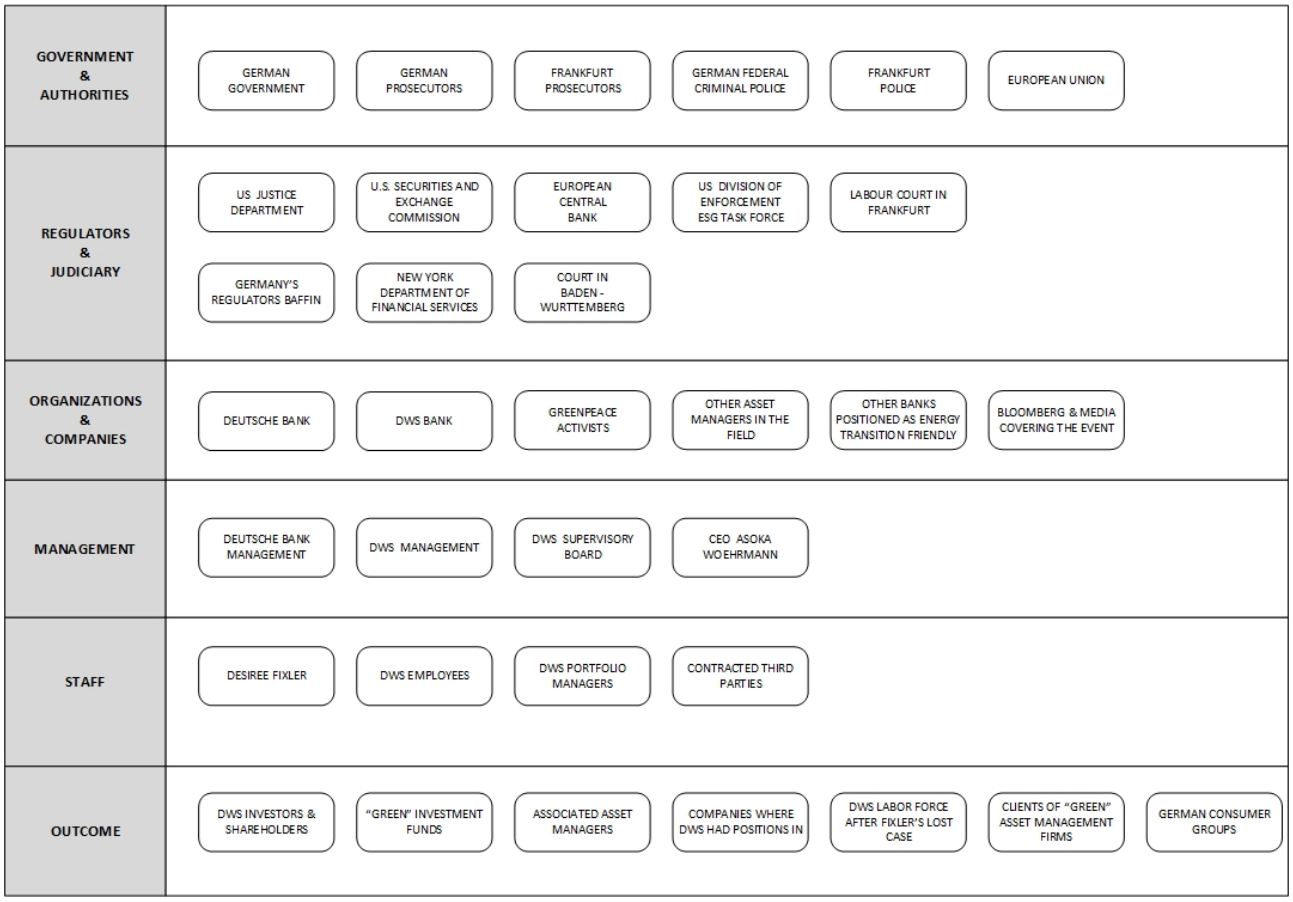

Figure 4.2: Stakeholders map for the DWS incident

This pattern is characteristic of greenwashing scenarios. A greenwashing incident within an organization is unlikely to occur without the knowledge or, at the very least, the tacit approval of its management. Once such an incident is exposed, it inevitably involves regulators and judicial authorities. In the case of Deutsche Bank (DB), being an international bank with a global presence, this involvement extends to multinational police forces, courts, juries, and various governments and regulatory bodies. These actors are all evident on the stakeholder map, as shown in Figure 4.2.

Furthermore, strong vertical integration is evident across the various layers. For instance, German prosecutors and police conducted investigations at both the DB and DWS premises in Germany. Additionally, Germany's financial regulator, BaFin, initiated an investigation into DWS and its parent company, DB, for suspected investment fraud. In the United States, the Department of Justice imposed a $19 million fine on DWS for misstatements regarding its Environmental, Social, and Governance (ESG) investment processes (Securities & Commission, 2023). Moreover, in Germany, a consumer protection group sued DWS for misrepresenting the green credentials of a fund in its marketing materials (Ennis, 2022). This case was subsequently resolved in court, where DWS settled the greenwashing allegations with the consumer watchdog through a cease-and-desist declaration (Kaminski, 2023).

Using this map but also the timeline constructed in Table 4.1 the Accimap for DWS is created.

4.5. Accimap for DWS greenwashing incident

Again, in order to construct the Accimap, the nine steps proposed by Banford and Hopkins (Banford & Hopkins, 2009) were followed. Having set the six layers, the outcomes were identified by analyzing the relevant literature, Table 4.1.

The events took place mainly in Germany, although there were legal issues for DWS in the USA, both before (of Justice, 2021a) and during the current events (Jaeger, 2022; Securities & Commission, 2023; Sun, 2023). The negative outcomes for DWS included the extension of an independent monitor by the U.S. Department of Justice to oversee DWS for one more year, i.e., February 2022-February 2023 (Jaeger, 2022; Kowsmann & Michaels, 2022; Sims & Prentice, 2022), a lawsuit from a consumer watchdog against DWS (Ennis, 2022; Kaminski, 2023; Sims & Orosz, 2023), and an expensive fine from the US Department of Justice (Securities & Commission, 2023). A negative outcome was also for Desiree Fixler, who lost a lawsuit against her former employer DWS (Kirakosian, 2022; Matussek & Arons, 2022).

The next step was to identify the causal factors. By making a list of all causes of the DWS incident data, that is, all factors for which you can say "had this been otherwise, the incident would (probably) not have occurred," three causal factors were identified:

1. Fixler made a presentation to DWS.
2. CEO Woehrmann fired Fixler.
3. Fixler accused DWS of greenwashing.

All three causal factors were assigned to the Staff layer. The numbering system used for the layers and nodes remained the same as in the previous incident. All the 32 contributory factors identified were arranged chronologically in the Accimap, placing the early events first to the left of each layer, the next one to the right, and so on. Each node shows the date or the year and the event that took place. The three types of connecting lines between the nodes were used here as well. The enlarged version can be seen in figure A.4 :

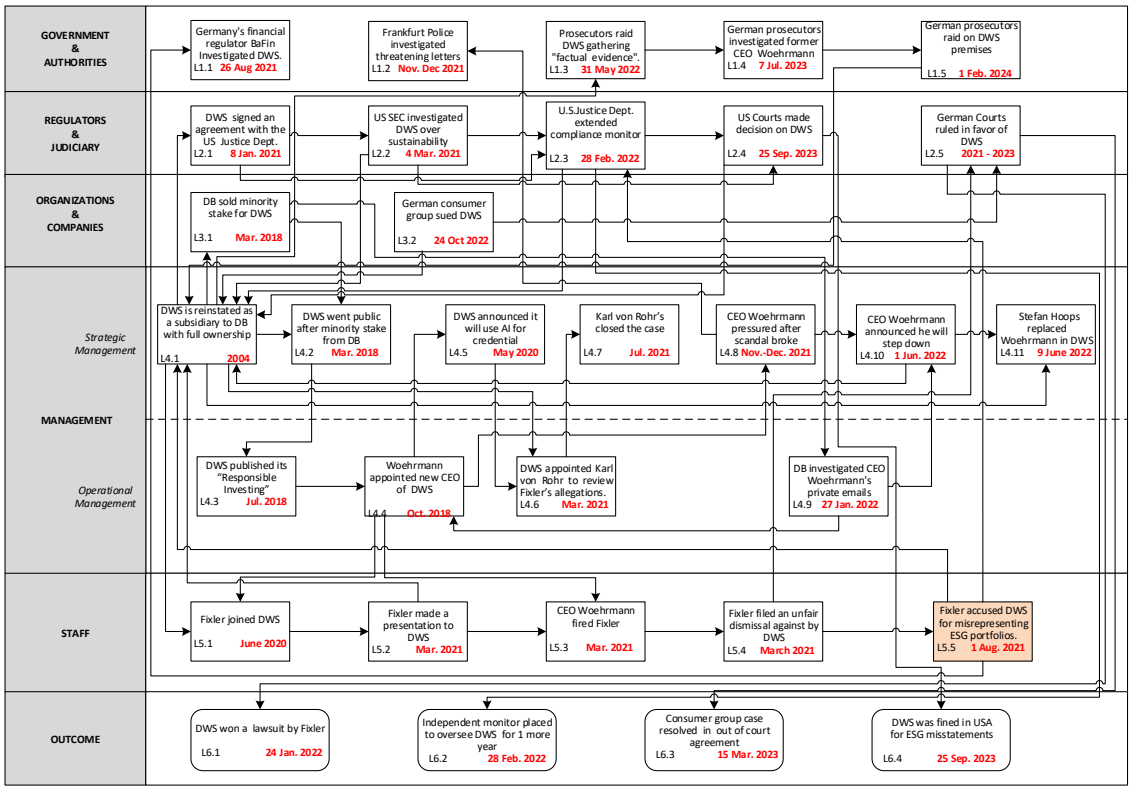

Figure 4.3: DWS Accimap and influencing factors

The 6 main layers of Accimap are adapted as described in Section 2.5.2, starting from top to bottom: Government & Authorities; Regulators & Judiciary; Organizations & Companies; Management; Staff, and Outcome. The distribution of the contributing factors in each of the five layers is shown in Table 4.2. For the Accimap, the same coding for each layer or level (L) as used in the previous chapter is applied here as well, Figure 4.3.

4.5.1. DWS Accimap event codes and distribution

Table 4.2: Coded Table for Deutsche Bank Accimap

LAYER 1 GOVERNMENT & AUTHORITIES	
L1.1	26 August 2021. After the firing of the group sustainability officer Desiree Fixler by DWS, it made headlines in the press in March 2021 and DWS's shares fell by 13.6%. At about the same time, Germany's financial regulator BaFin started investigating DWS and its parent company DB for suspected investment fraud resulting from greenwashing (de Paoli, 2021; Miller et al., 2021). The investigation followed probes by regulators on both sides of the Atlantic since 2021 over accusations that DWS, which managed €841bn ($921.57bn) and was controlled by DB, may have misled investors by marketing its funds as greener than they were. Frankfurt prosecutors announced that investigators were carrying out raids "on suspicion of investment fraud" (Sims & Orosz, 2023). This investigation came as a blow to Deutsche Bank (DB), DWS's majority shareholder (Miller et al., 2021). Even if the announced investigation was unable to verify that ESG claims had been overstated, the reputational damage to DWS was enough. Asset managers feared that BaFin's investigation might be across the board, since total assets in funds coded as sustainable were about $2.24tn in June. But increasing demand had coincided with fears of widespread "greenwashing" (Miller et al., 2021).
L1.2	November-December 2021. Frankfurt police investigated allegations by CEO Woehrmann of DWS, that he received threatening letters (Sims & Siebelt, 2022a, 2022b).
L1.3	On the 31 May 2022, Prosecutors and other officials raided DWS and Deutsche Bank. Prosecutors said they were following up on news reports and the whistleblower's claims and gathered "sufficient factual evidence" (Axelsson, 2022; DW, 2022; Murray & Sims, 2022). A day later, on the 1 June 2022, Asoka Woehrmann, CEO of Germany's largest asset manager DWS, announced he will step down on the 9th of June, hours after police raided its offices by 50 officers from the Frankfurt public prosecutor, German regulator BaFin, and Federal Criminal Police Office (Gordon, 2022; Palmer, 2022). Interestingly, DWS only reported €115bn in ESG assets in its 2021 annual report, down from €459bn of "ESG integrated" assets a year earlier and down considerably on the figure published in 2020 (Axelsson, 2022; Gordon, 2022; Murray & Sims, 2022).
L1.4	About a year later, on the 7 July 2023, German prosecutors announced that they are investigating asset manager DWS's former chief executive Asoka Woehrmann over allegations of investment fraud through greenwashing (Sims & Heine, 2023).
L1.5	A similar scenario took place on the 1st February 2024, when Frankfurt prosecutors visited again the premises for searching, in connection with the greenwashing allegations against DWS, as was announced by the DWS group (Arons, 2024; Sims, 2024).
LAYER 2 REGULATORS & JUDICIARY	
L2.1	The US Department of Justice charged DB that between the years 2008-2016, it formed a scheme to conceal corrupt payments and bribes made to third-party intermediaries by falsely recording them on DB's books and records, as well as related internal accounting control violations, and a separate scheme to engage in fraudulent and manipulative commodities trading practices involving publicly-traded precious metals futures contracts (of Justice, 2021a). The company also faced legal controversies regarding money laundering in Russia (Harding, 2019), interest rate manipulation (USDOJ, 2017), violating the US-Iran embargo (Guardian, 2015), its commercial ties to convicted sex offender Jeffrey Epstein (Stempel, 2023), and its role in the Danske Bank money laundering scandal (Gregg, 2023), among others (Sims & Orosz, 2023). It was for these reasons, the DWS was forced to sign a Deferred Prosecution Agreement ("DPA") with the US Department of Justice on January 8, 2021 (of Justice, 2021a). Under the DPA, the bank wouldn't face criminal charges if it abided by certain requirements, including compliance measures and cooperating with investigations, for three years. DB also remained under the watch of outside monitors appointed in 2017 by New York's Department of Financial Services as part of the settlement of a "mirror trades" case, in which the bank moved $10 bn of Russian client money out of the country (Kowsmann & Strasburg, 2021). (Mirror trading allows traders or investors to mimic others by implementing the same trades that others do in the trader's own account (Chen, 2022)).

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Table 4.2 – continued from previous page

L2.2	On the 4th March 2021, the US Securities and Exchange Commission (SEC) announced the creation of a Climate and ESG Task Force in the Division of Enforcement (Securities & Commission, 2021). Its focus would be to identify any material gaps or misstatements in issuers' disclosure of climate risks under existing rules. The task force would also analyze disclosure and compliance issues relating to investment advisers' and funds' ESG strategies (Securities & Commission, 2021). It was these events that preceded Desiree Fixler's firing by DWS on the 15th March 2021, and subsequent revelations made to the Press, when the US SEC started probing DWS Group's overstatement of its sustainability criteria on investing and managing its assets (Kowsmann, Ramey, & Michaels, 2021). ESG has become a huge business for asset managers. Assets in ESG funds surpassed $2 trillion globally (Kowsmann, Ramey, & Michaels, 2021). SEC and federal prosecutors investigated DWS Group, after the firm's former head of sustainability said it overstated how much it used sustainable investing criteria to manage its assets (Kowsmann, Ramey, & Michaels, 2021).
L2.3	On the 28th February 2022, DB agreed to extend the term of an outside compliance monitor after the US Justice Department prosecutors found the bank violated a criminal settlement by not disclosing a misconduct complaint in its asset manager's sustainable-investing business. Instead of hearing about it from the bank, as part of the settlement reached with New York's Department of Financial Services (Kowsmann & Strasburg, 2021), the U.S. authorities learned it from the Press (Kowsmann & Michaels, 2022).
L2.4	On the 25th September 2023, the result of the US investigation led the US Department of Justice to charge DWS for two separate enforcement actions, $6m to address its failure to develop a mutual fund Anti-Money Laundering (AML) program, and $19m concerning misstatements regarding its Environmental, Social, and Governance (ESG) investment process. To settle the charges, DWS agreed to pay $25 million in penalties (Securities & Commission, 2023).
L2.5	24 January 2022. A German labour court in Frankfurt dismissed Desiree Fixler's lawsuit against asset management firm DWS (Matussek & Arons, 2022; of Justice, 2021b; Rezmer & Votsmeier, 2022). On the 15th March 2023 DWS settled the greenwashing court case with the consumer watchdog in Baden-Württemberg through a cease-and-desist declaration, refraining from marketing certain features of its Invest ESG Climate Tech Fund as sustainable in the future (Ennis, 2022; Kaminski, 2023; Sims & Orosz, 2023).
LAYER 3 ORGANIZATIONS & COMPANIES	
L3.1	March 2018. DWS shares debut as Deutsche Bank sells a minority stake in the division, marking a key step in the bank's overhaul to move past lawsuits and trading scandals(Sims & Orosz, 2023; Strasburg, 2018).
L3.2	On the 24th October 2022, a German consumer group sued DWS for misrepresenting a fund's green credentials in marketing materials (Ennis, 2022; Sims & Orosz, 2023). The suit, filed in relation to the DWS Invest ESG Climate Tech fund, claimed the asset manager's marketing materials simultaneously indicated the fund invested 0% in coal but that fund holdings could include companies that derive 15% of their revenue from coal (Ennis, 2022).
LAYER 4 MANAGEMENT	
L4.1	In 2004 Deutsche Bank assumed full ownership of DWS (Bank, 2004; Sims & Orosz, 2023).
L4.2	In March 2018, DB sold a minority stake in DWS to help the bank move on from lawsuits and trading scandals (Sims & Orosz, 2023; Strasburg, 2018).
L4.3	In July 2018, DWS published a report called "Responsible Investing", saying it has a sustainability history of two decades (DWS, 2018b; Sims & Orosz, 2023).
L4.4	In October 2018, Asoka Woehrmann was appointed CEO, having spent years at DWS and Deutsche Bank (DWS, 2018a; Media, 2018; Sims & Orosz, 2023).
L4.5	In May 2020, DWS announced it would use artificial intelligence to identify companies with climate risks (DWS, 2020; Sims & Orosz, 2023).
L4.6	In March 2021, DWS' supervisory board, headed by DB's Karl von Rohr, was charged to investigate Desiree Fixler's allegations on DWS's greenwashing, where Fixler addressed the Group's deficiencies on Environment, Social and Governance (ESG) and launched an internal review (Heath & Fischer, 2022; Sims & Orosz, 2023).

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Table 4.2 – continued from previous page

L4.7	A few months later, in July 2021, Karl von Rohr and DWS' supervisory board found no evidence to back up Fixler's allegations and decided to close the case (Sims & Orosz, 2023).
L4.8	November -December 2021. Woehrmann receives threatening letters. Frankfurt police investigated. Woehrmann has been under pressure on multiple fronts since the greenwashing allegations broke. (Sims & Siebelt, 2022a, 2022b).
L4.9	On the 27 January 2022, DB conducted an internal investigation into CEO Woehrmann's possible private email usage for business purposes and alleged a DB client had transferred to Woehrmann the sum of €160,000 (Gordon, 2022; Sims & Siebelt, 2022d).
L4.10	On the 1st June 2022, CEO Woehrmann announced he will step down the following week (Gordon, 2022). DWS said in a statement that CEO Woehrmann, who has been at the helm since 2018, would resign a day after the company's annual shareholders meeting on 9 June (Axelsson, 2022; Gordon, 2022; Langley & Miller, 2022).
L4.11	Stefan Hoops was named as the new CEO of DWS. The greenwashing allegations played a key role in the departure of CEO Asoka Woehrmann. However, his credibility had already been tarnished following his use of personal email for business purposes and a payment made to him by a client when he was head of Deutsche Bank's private-client business before being appointed as DWS' CEO in 2018 (Schiffler, 2022).
LAYER 5 STAFF	
L5.1	In June 2020, Desiree Fixler joined DWS as group sustainability officer (Albuquerque, 2020; Segal, 2020; Sims & Orosz, 2023).
L5.2	In March 2021 Desiree Fixler made a presentation to the executive board of DWS saying the firm had no clear ambition or strategy, lacked policies on coal and other topics, and that ESG teams were seen as specialists rather than being an integral part of the decision-making (Kowsmann & Brown, 2021). She also called for urgent and profound changes (Bartz, 2021). That contrasted with what DWS told investors in its 2020 annual report: "As a firm, we have placed ESG at the heart of everything that we do" it said. It also said it had made meaningful progress during 2020 to meet its ambition of being a leading ESG asset manager. Among the progress, it said, was the hiring of Ms. Fixler in August for the new role (Kowsmann & Brown, 2021).
L5.3	11 March 2021. Ms. Fixler was fired one day before the annual report was released (Kowsmann & Brown, 2021). At the end of March 2021, DWS sent an internal memo from CEO Wöhrmann to the Bloomberg news agency, announcing the dismissal of Desiree Fixler and claiming that she had not pushed the ESG agenda enough (Bartz, 2021; de Paoli, 2021). The memo also noted that her duties for sustainable investments would be taken over by CEO Asoka Woehrmann (de Paoli, 2021).
L5.4	March 2021. Desiree Fixler filed an unfair dismissal case against DWS in a labour court in Germany (Kirakosian, 2022).
L5.5	1st August 2021. Ms. Fixler said to the press she believed DWS misrepresented its ESG capabilities. She said revisions and verbal objections she had made to the annual report before publication, including how many assets were under ESG integration, were never included (Kowsmann & Brown, 2021).
LAYER 6 OUTCOME	
L6.1	On the 24 January 2022, a German labour court in Frankfurt dismissed Desiree Fixler's lawsuit against asset management firm DWS, where she appealed for her dismissal from the DB Group (Kirakosian, 2022; Matussek & Arons, 2022).
L6.2	28th February 2022. DB agreed with the U.S. Department of Justice to extend the stay of a special monitor for one more year, i.e. February 2023 (Jaeger, 2022; Kowsmann & Michaels, 2022; Sims & Prentice, 2022).
L6.3	On the 15th March 2023, DWS settled the greenwashing court case with the consumer watchdog in Baden-Württemberg through a cease-and-desist declaration (Ennis, 2022; Kaminski, 2023; Sims & Orosz, 2023).
L6.4	The result of the US investigation led by the US Department of Justice, was to charge DWS with $19m for misstatements regarding its Environmental, Social, and Governance (ESG) investment process (Securities & Commission, 2023).

4.6. Chapter Discussion & Conclusions

The whole approach of creating an Accimap framework in greenwashing is not to try and find who is guilty and point the finger at specific persons but to understand the events of an incident and draw useful conclusions to avoid similar situations in the future (Rasmussen, 1997). Since the problem of greenwashing in the banking sector is not limited to Deutsche Bank but is more widespread (Galletta et al., 2024), it will be helpful to study the mechanisms that led DWS to the indictment, being obliged to be under the auspices of an external monitor in the USA and paying fines (Gendre, 2024a).

As we discussed above, in layer 5 on Accimap, it was DWS's former head of sustainability, Desiree Fixler, who alerted the Swiss Financial Supervisory Authority (Miller et al., 2021) (BaFin), layer 1 in Accimap, and the US Securities and Exchange Commission (Kowsmann, Ramey, & Michaels, 2021) (SEC), layer 2 in Accimap, as to the greenwashing activities of her former employers. In both cases, DWS was accused of presenting some of its investment products as sustainable in the company's prospectus, whereas the ESG criteria were not taken into consideration for their investment products. Basically, sustainability was not based on concrete criteria, and as a result, some products were presented as "greener" and more "sustainable" than they were (Gendre, 2024a). As a result, the head of DWS, Asoka Woehrmann, resigned on 9 June 2022, layer 4 in Accimap.

The impact of this incident on the financial world was very important. In recent years, trillions of dollars have flowed into ESG-compatible funds as climate change has led many investors to take a closer look at where their money is going (Bartz, 2021). As mentioned in layer 1 in Accimap, DWS only reported €115bn in ESG assets in its 2021 annual report, 75% down from €459bn of "ESG integrated" assets a year earlier in 2020 (Gordon, 2022). This significant drop within a year is attributed to the strengthening of European regulations, with an emphasis on the transparency of these products. It is important to remember that on 10 March 2021, the implementation of the European Regulation EU 2019/2088 on the sustainability disclosures in the financial sector took place (Gendre, 2024a; Union, 2019). Moreover, the EU has put in place a transparency framework, the Sustainable Finance Disclosure Regulation (Commission, 2024b) (SFDR). The latest SFDR regulation places the EU Commission as a world leader in sustainable finance policy. SFDR addresses three crucial elements: first, it promotes transparency through mandatory self-disclosure; secondly, it makes a clear distinction between financial products that simply integrate environmental, social, and governance (ESG) characteristics in their investment process and those products which actively deliver an impact in the real world. Thirdly, it protects against potential greenwashing as its principal adverse impact indicators will be a key yardstick on whether a financial product achieves its sustainability aims or not, particularly in the context of secondary financial markets (Alessi et al., 2024).

Another aspect which the DWS incident highlighted in this Accimap is the issue of ESG risk integration. When Desiree Fixler in her presentation to DWS asked for reforms in the way ESG would be applied at the investment funds (Kowsmann & Brown, 2021), layer 5 in the Accimap, she touched a very sensitive point for the investors. ESG risk integration assumes the integration of environmental, social, and governance aspects into the investment process, which has (1) social and environmental plus (2) financial aims. However, environmental and social aims are subordinated to achieving first the financial aims (Alessi et al., 2024). Investors who signed the UN Supported Principles for Responsible Investing (PRI) committed to the PRI's principles on six ESG ambitions only if they were "consistent with their fiduciary responsibilities" (Program, 2016). This allows many PRI signatories to recognize ESG objectives as subordinate to financial objectives, contrasting them with impact investors who set financial and societal aims first (Cojoianu, Hoepner, & Lin, 2022).

Before closing the discussion, it is noteworthy to add some aspects that indirectly surfaced in this Accimap. Greenwashing appears to evolve rapidly on the one hand, but on the other, many feel that greenwashing is still at an early stage where not even the definition of it is well established (Alessi et al., 2024). Another issue is that the immediate abandonment of the use of fossil fuels does not seem to be conceivable as it stands. Global energy needs do not make this hypothesis credible (Gendre, 2024a). To move away from fossil fuels, an alternative system must first be created – ideally based on the use of renewable energies (Gross, 2020). However, the reality of climate change and the role that fossil fuels play in this crisis require us to find a way to phase them out as soon as possible. This is where tensions arise, as many perceive banks to be dragging their feet on this issue (Gendre, 2024a).

Chapter 5
The Shell v. Millieudefensie greenwashing lawsuit

5.1. Chapter Summary

Similar to Chapters 3, 4 the case of Shell is extensive and carries significant weight for the overall industry. In this chapter the events are detailed and analyzed, the stakeholders and the critical event that led to the lawsuit are placed in perspective and the Accimap is constructed. Finally the discussion of the chapter and the several conclusions drawn as presented at the end of the chapter.

5.2. Timeline of events for the Shell v. Millieudefensie Case

On 26 May 2021, Royal Dutch Shell plc., one of the largest oil and gas companies in the world, was ordered by a court in Hague, Netherlands, to reduce all CO_2 emissions into the atmosphere by at least net 45% by the end of 2030, relative to 2019 levels, throughout its world operations (Court, 2021). This followed a legal action against the company by 17,379 individual claimants, who accused Shell of greenwashing and damaging the environment through its excessive CO_2 emissions (C. S. Shell, 2019).

Bellow, the facts that led to this court order against Shell were examined by using the Accimap framework of this greenwashing incident. The timeline of the events unfolded mainly between the years 2007-2021, but the roots of the events lie decades earlier back in the 1950s.

Table 5.1: Timeline of Events for the lawsuit on greenwashing of Shell

Date	Event
1950	Since 1950, Shell has been doing paleontological studies and was aware of climate change's role in causing rising sea levels and hurricanes as early as the 1950s (for International Environmental Law (CIEL), 2017; C. S. Shell, 2019).
1959	American physicist Edward Teller warned at a conference that a 10% increase in atmospheric CO2 would result in a rise in temperature enough to melt ice caps and submerge New York, affecting all coastal towns and cities (for International Environmental Law (CIEL), 2018; Franta, 2018).
1960-2020	Shell and the State of the Netherlands had a close collaboration starting in the 1960s regarding the extraction and distribution of Groningen gas and collaboration to secure Shell positions abroad (N. Times, 2020; van Beek et al., 2019).
1962	Marion King Hubbert, Consultant at Shell, produced a report warning that the accumulation of CO2 in the atmosphere would result in higher temperatures, changing weather conditions, and disrupting the ecological balance (for International Environmental Law (CIEL), 2018; C. S. Shell, 2019).
1973	After the oil crisis in 1973, many oil and gas companies, including Shell, decided to diversify. In 1979, Shell acquired 50% shares in Solarhart, an Australian solar heating company (for International Environmental Law (CIEL), 2018).
1979-1983	Multinational companies, through a Task Force within API, studied CO2 emissions, confirming they were on the rise and negatively affecting climate change. The Task Force proposed starting the use of cleaner fuels and studying the technical implications of an energy transition (Banerjee, 2015; Minutes, 1980).

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Table 5.1 – continued from previous page

Date	Event
1988	In 1988, a Shell working group completed a report called ”The Greenhouse Effect” which calculated Shell’s own CO2 emissions and recognized that climate change could have direct operational consequences from rising sea levels, impacting offshore installations, coastal facilities, and operations (for International Environmental Law (CIEL), 2018; Shell, 1988).
1990	Shell knew as early as the 1990s that global warming should be limited to less than 2°C to prevent a major climate disaster (Jr., 2018; C. S. Shell, 2019).
1991	Shell was aware of the gravity of the situation to such an extent that in 1991, it decided to make a documentary entitled ”Climate of Concern”. The film warned that abnormal weather conditions across the globe could become the new standard and climate change could happen so fast that society would have no time to adjust (Mommers, 2017; C. S. Shell, 2019).
1996	The EU has been pursuing a policy since 1996 that global warming should be reduced to less than 2°C to avert a great danger (Commission, 1996). In the 1990s, it was assumed that to achieve this, the levels of greenhouse gases in the atmosphere had to remain below 550 ppm (Commission, 1996).
1998	Shell knew in 1998 that a 450 ppm CO2 scenario would require an enormous reduction of tradeable fossil fuels. This is evidenced by Shell’s brochure from that time entitled ”Climate Change, what does Shell think and do about it” (Shell, 1998).
2002	Shell reported that it was the source of the equivalent of 3.6% of global CO2 emissions in 2002 due to fossil fuel use (Shell, 2004). This report proved Shell could indicate its contribution to global emissions as early as 1984 on a fuel-by-fuel basis (Shell, 1988; C. S. Shell, 2019).
2004	In 2004, Shell acknowledged in its sustainability report that climate change required the company to deal with its own emissions and the emissions of its customers (Shell, 2004).
2007	It emerged that atmospheric levels of GHG had to be kept below 450 ppm because even with the 450 ppm scenario, the chance of staying below 2°C was only 50% (13, 2008).
2007-2011	Due to the Bali Action Plan and the IPCC report of 2007, it became clear that the 450 scenarios needed to be followed, and Shell recognized the need to take preventive measures (13, 2008; Shell, n.d.).
2007	In 2007, Shell purchased tar sands in Canada for $2.5bn to start extracting tar sand oil, a highly polluting substance. Shell had invested $7.4bn in Canada the previous year for the same purpose and explicitly mentioned its ambition to become the global leader in tar sand extraction (Stockman, Rowell, & Kretzmann, 2009).
2007	Shell opposed a proposal from the European Commission for the Fuel Quality Directive, designed to force producers to reduce the emission intensity of fuels by 10% by 2020. The European Petroleum Industry Association (EUROPIA), representing Shell and others, lobbied against the 10% target (Stockman, Rowell, & Kretzmann, 2009).
2008	Shell was reprimanded by the English advertising code committee (ASA) for a misleading advert in the Financial Times suggesting that investing in tar sand oil guarantees a sustainable future, even though it would only increase greenhouse gas emissions (Hickman, 2008).
2008	Shell’s CEO Jeroen van der Veer acknowledged that tar sand oil is CO2-intensive but placed the responsibility on the Canadian government, which enabled Shell to exploit the tar sands commercially (PBS.org, 2008).
2011	Shell successfully lobbied against binding renewable energy targets for EU Member States for 2030, promoting gas instead of renewable energy as the best way to achieve emission reduction targets. Shell wrote a letter to the then President of the European Commission, Barroso, saying that Europe could save 500 billion euros by focusing on gas instead of renewable energy and that the best way to achieve the emission reduction targets would be by means of carbon market, not through binding targets for renewable energy. (Neslen, 2015).
2011	Shell was reprimanded by the Dutch Advertising Code Committee for a misleading advert claiming that natural gas is clean and abundant for the next 250 years, neither of which were true (C. S. Shell, 2019).

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Table 5.1 – continued from previous page

Date	Event
2011	The Royal Netherlands Meteorological Institute (KNMI) provided insight into the potential impacts of climate change in the report ”KNMI 14 climate scenarios for the Netherlands” (C. S. Shell, 2019).
17 June 2014	The Dutch State Secretary of Infrastructure & Environment expressed concerns about the impact of climate change on food security supplies in a letter to the House of Representatives responding to the IPCC AR5 WGII report (IPCC, 2014a; C. S. Shell, 2019).
2014	Since 2007, Shell's corporate strategy assumed that the required global climate target would not be met, with the management board stating in 2014 that at least 50% of all energy supplies would still be fossil fuels in 2050 (C. S. Shell, 2019; Vidal, 2014).
2015	The Paris UN agreement set the goal of reducing global warming to well below 2°C and preferably to 1.5°C (UNFCCC, 2015).
2015	During the World Gas Conference in 2015, Shell urged governments to promote the use of Liquid Natural Gas (LNG) (C. S. Shell, 2019; van Beurden, 2015).
2015	A study of global industrial GHG emissions between 1988 and 2015 showed that more than half of total GHG emissions were caused by only 25 companies, including Shell, responsible for 1.7% of all industrial GHG emissions (Griffin, 2017).
2017	A 2017 study published by InfluenceMap showed that Shell used several trade associations for its lobbying activities, often obstructing climate action (InfluenceMap, 2016).
2017	In April 2017, Shell's management board stated that the fossil industry must ensure that gas is seen as part of the solution to climate change, not part of the problem (Wetselaar, 2017).
2017	In November 2017, Shell's management presented a climate ambition to reduce the CO2 intensity of its energy products by 20% by 2035 and by half by 2050, without absolute emission reductions (Muttitt, 2018; Shell, 2017a).
2018	Shell announced in January 2018 that it would focus on oil and gas from shale, which involves higher CO2 emissions compared to conventional crude oil and natural gas due to the fracking drilling technology required (van Dijk, 2018).
4 April 2018	In a letter dated 4 April 2018, 7 Dutch NGOs under the umbrella of Milieudefensie held Shell liable for its current policy and demanded conformity with the Paris Agreement climate targets (C. S. Shell, 2019).
2018	In 2016, 2017, and 2018, a group of shareholders filed resolutions calling on Shell's management to align its business strategy with the Paris target, which Shell's management advised shareholders to vote against (Ambrose, 2024; Frost, 2024; Plc, 2017; This, 2024).
12 February 2019	On 12 February 2019, the Milieudefensie letter was resent to Shell, representing all claiming NGOs. Shell continued to reject the claims (Milieudefensie, 2018).
5 April 2019	Milieudefensie et al. summoned Shell and asked the court to impose the requested action on Shell (C. S. Shell, 2019).
26 May 2021	The court in Hague ordered Shell to reduce CO2 emissions in its global operations by at least 45% net by the end of 2030, relative to 2019 levels (Court, 2021).
1950-2024	Shell has polluted the land of the Niger delta for many decades. The U.N. Environment Program's 2011 report criticized Shell and the Nigerian government for 50 years of pollution and recommended a comprehensive, billion-dollar cleanup (Adebayo, 2023; Laville, 2024).

5.3. The critical Event in Shell's case

Royal Dutch plc decided after 2007 to explore deeply fossil fuels, ignoring the sustainability issues and the major problems arising from global emissions (Stockman, Rowell, & Kretzmann, 2009). In 2008, Shell was reprimanded by the English advertising code committee (ASA) for a misleading advert in the Financial Times regarding misuse of the term “sustainability” (Hickman, 2008). A similar issue arose in 2011, when Shell was reprimanded by the Dutch Advertising Code Committee because it presented falsified data on natural gas (C. S. Shell, 2019). It was a long list of actions ignoring the environmental issues by Shell, dating back many years and including actions in many countries around the globe (Adebayo, 2023; Stockman, Rowell, & Kretzmann, 2009), that in 2018 and again in 2019, led 7 Dutch NGOs under the umbrella of Milieudefensie, to send a letter to Shell asking to align its policy and conform with the climate targets under the Paris Agreement (Milieudefensie, 2018). Shell rejected Milieudefensie et al.'s demands (C. S. Shell, 2019). Milieudefensie et al. summoned Shell and asked the court to impose the requested action on Shell (C. S. Shell, 2019).

A Dutch court in Hague, after 2 years of deliberations, listening to both sides involved and examining the facts, announced its decision in 2021. The court ordered Shell to reduce the CO_2 emissions of the Shell group by a net 45% by 2030, compared to 2019 levels (Court, 2021).

The Cause-Consequence-Chart (CCC) around the critical event is shown in Figure 5.1.

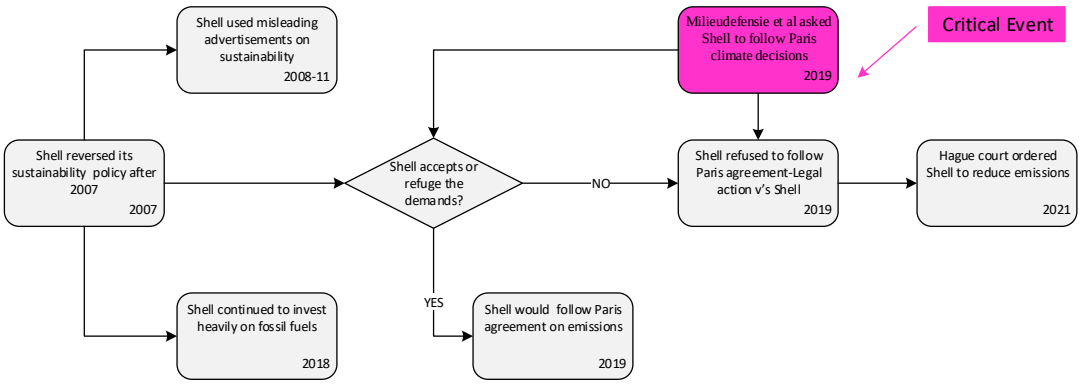

Figure 5.1: Cause-Consequence-Chart (CCC), identifying the Critical Event of the SHELL incident"

5.4. Stakeholders map for the Shell Case

Similar to the previous Chapters, the case-specific stakeholders are allocated in the six layers and analyzed. The stakeholders directly derive from the timeline and showcase the multiplicity in level distribution and systemic consequence that the several players assumed.

GOVERNMENT & AUTHORITIES	CANADIAN GOVERNMENT	UK ADVERTISING STANDARDS AUTHORITY (ASA)	DUTCH ADVERTISING CODE COMMITTEE	UNITED NATIONS	OECD	UNITED KINGDOM
	DUTCH ENVIRONMENTAL MINISTRY	DUTCH GOVERNMENT	EUROPEAN UNION	NEW YORK GOVENOR	AUSTRALIA	NIGERIA
REGULATORS & JUDICIARY	HAGUE COURT	DUTCH COURTS	NIGERIAN COURTS	INTERNATIONAL COURTS		
ORGANIZATIONS & COMPANIES	ROYAL DUTCH plc	AMERICAN PETROLEUM INSTITUTE (API)	EUROPEAN PETROLEUM ASSOCIATION (EUROPIA)	SHELL COMPETITORS	BUSINESS EUROPE	INTERNATIONAL PETROLEUM ASSOCIATION (IPIECA)
	AUSTRALIAN PETROLEUM ASSOCIACION (APPEA)	CANADIAN ASSOCIATION (CAPP)	FUELS EUROPE	MILIEUDEFENSIE	STICHTING GREENPEACE NEDERLAND	FOSSIELVRIJ NL
	JONGEREN MILIEU ACTIEF	STICHTING BOTH ENDS	STICHTING ACTIONAID	WADDENVERE-NIGING	MILLIEUDEFENSIE	OTHER NGO's
MANAGEMENT	SHELL'S SUSTAINABILITY COMMITTEE	SHELL'S ENERGY TRANSITION CAMPUS	SHELL BOARD SHAREHOLDERS	CEO BEN VAN BEUREN	SHELL BOARD OF DIRECTORS	
STAFF	SHELL STAFF	SHELL RESEARCH LABORATORIS	MARION K. HUBERT DIRECTOR OF SHELL RESEARCH LABS	CENTRE OF RESEARCH FOR MULTINATIONSL CORPORATIONS		
OUTCOME	SHELL INVESTORS AND SHAREHOLDERS	GENERAL PUBLIC WHERE SHELL HAS ACTIVITIES	DUTCH GENERAL PUBLIC	NIGERIAN ACTIVISTS	THIRD PARTY PARTNERS	

Figure 5.2: Stakeholders map for the Shell incident

One observation we make by examining the Stakeholders' map is that all the layers are populated, which confirms that a system's approach can be used to analyze Shell's incident. Additionally, we notice that multiple

actors fill most of the map's layers, confirming the complexity of the incident. It is evident that two layers are especially populated by many different actors, i.e., Government & Authorities and Organizations & Companies. Usually, in Accident Analysis, layers 5 and 6 (counted from top to bottom) are the most filled with actors (P. M. Salmon et al., 2020), whereas the initial layers have the least percentage population (P. M. Salmon et al., 2020).

Furthermore, we observe that there exists good vertical integration through the layers. When the seven NGOs under the umbrella of Milieudefensie et al. asked the Shell Company, by sending them a detailed letter twice, to talk about Shell's sustainability obligations as one of the large global polluters, Shell refused (Milieudefensie, 2018; C. S. Shell, 2019). This led Milieudefensie et al. to the court to impose the requested action on Shell (C. S. Shell, 2019). Another example of integration is the heavy involvement of such an organization as the United Nations in the global corporate strategy for sustainability, something that Shell agreed to follow (Compact, 2015a, 2015b, 2015c; OECD, 2011; Shell, 2017c), but their actions went in the opposite direction (C. S. Shell, 2019). Eventually, a court in The Hague imposed on Shell the obligation to follow some of the rules of the Paris Agreement (Court, 2021).

5.5. Accimnap for the Shell greenwashing incident

For the drawing of the Accimap framework, we follow the procedure of the nine steps described in Chapter 2 in section 2.5. The six main layers of the Accimap were adapted as follows, starting from top to bottom: Government; Regulators & Judiciary; Organizations & Companies; Management; Staff; and Outcome, as shown in Figure 5.3. The enlarged version can be seen in figure A.5 :

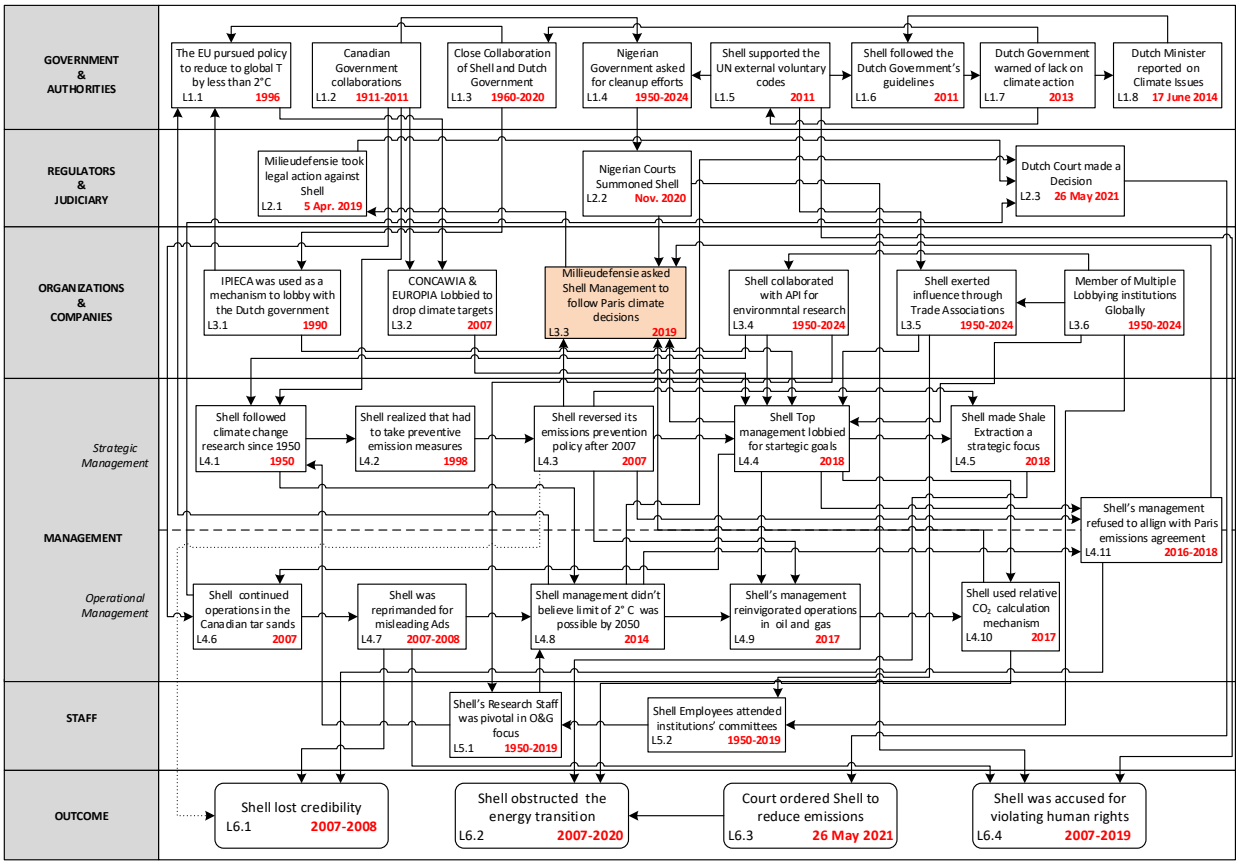

Figure 5.3: Stakeholders map for the Shell incident

As with the previous two incidents, the Accimap was constructed following the nine steps proposed by Branford et al., 2009. The description of the six layers remains the same as used previously, whereas the outcomes were identified by analyzing the relevant literature, as shown in Table 5.1.

The actions took place mainly in the Netherlands, but the unfolding events had global influence (IPCC, 2014a; C. S. Shell, 2019). A negative outcome was Shell's greenwashing practices misleading the public, at least three times through ambiguous advertisements in the Dutch and British media (Hickman, 2008; Hough, 2007; Masud, 2023). A major negative outcome for Shell, was the fact that a court in Hague in 2021 ordered

Shell to reduce the CO_2 emissions of the Shell group by a net 45% by 2030, compared to 2019 levels (Court, 2021).

The next step was to identify the causal factors. By making a list of all causes of the Shell incident data, that is, all factors for which you can say "had this been otherwise, the incident would (probably) not have occurred," four causal factors were identified:

1. Shell reversed its emissions prevention policy after 2007.
2. Shell's management continued to invest in oil and gas.
3. Shell's management refused to align with the Paris emissions agreement.
4. Milieudefensie asked Shell to follow Paris climate decisions.

The first causal factor was placed at the Organizations & Companies layer, the second and third at the Management layer, and the fourth at the Organizations & Companies layer. The numbering system used for the layers and nodes remained the same as in the previous incidents. All the 34 contributory factors identified were arranged chronologically in the Accimap, placing the early events first to the left of each layer, the next one to the right, and so on. Each node shows the date or the year and the event that took place. The three types of connecting lines between the nodes were used here as well.

5.5.1. Shell Accimap event codes and distribution

The coded table for the events is used and showcased below as done previously in Chapters 3 & 4.

Table 5.2: Coded Table for the Shell v. Millieudefensie Accimap

LAYER 1 GOVERNMENT & AUTHORITIES	
L1.1	1996. The EU has been pursuing the policy since 1996 that global warming should be reduced to less than 2°C to avert a great danger. In the 1990s, it was assumed that to achieve this, the levels of greenhouse gases in the atmosphere had to remain below 550 ppm (Commission, 1996).
L1.2	1911-2011. According to its own site, Shell completed a 100-year presence in Canada by 2011. Its involvement in service stations, oil pipelines, oil refineries, natural gas and oil tankers covers practically all sections of the oil business (Shell.ca, 2024). However, both Shell and the Canadian government hit most of the press headlines in their involvement with the Canadian Oils Sands, a sludgy deposit of sand, clay, water, and sticky, black bitumen, which is particularly environmentally hazardous (Finkel, 2018; in Action, 2015; Stockman, Rowell, & Kretzmann, 2009).
L1.3	1960-2020. Shell and the State of the Netherlands had a close collaboration that started in the 1960s with the extraction and distribution of Groningen gas and continued the collaboration in order to secure Shell positions abroad (Hogg, 2023; of Management, 2021).
L1.4	1950-2024. Shell has polluted the land of the Niger Delta for many decades. At the request of the Nigerian government, the U.N. Environment Program conducted an independent environmental assessment of Ogoniland, releasing a report in 2011 that criticized Shell and the Nigerian government for 50 years of pollution and recommended a comprehensive, billion-dollar cleanup. The Nigerian government announced the cleanup in 2016, but there was no visible restoration on the ground. The government said community protests and lawsuits by local activists have hampered progress (Adebayo, 2023). Moreover, Shell plc is preparing to divest from the delta and leave the region, but it has a legal obligation to remain until it has cleaned up its legacy of pollution (Laville, 2024). A report by the Centre for Research on Multinational Corporations (Somo) said historical pollution remains a serious issue in the area and accuses Shell of trying to avoid responsibility despite the billions of dollars it has earned from the oil in the region (Laville, 2024).

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Table 5.2 – continued from previous page

L1.5	2011. Shell, according to its current site, since 2011 in addition to its commitments, policies, and standards, also supports a number of external United Nations voluntary codes on Universal Declaration of Human Rights, UN Guiding Principles on Business and Human Rights, United Nations Sustainable Development Goals, Voluntary Principles on Security and Human Rights, and United Nations Global Compact (UNGC) (Shell, n.d.). Shell became a founding member of the UN Global Compact in 2006, an initiative involving non-state actors—primarily international businesses—designed to emphasize their responsibility, alongside countries, to address major global issues (Compact, 2015a, 2015b, 2015c; OECD, 2011; Shell, 2017c). However, Shell was accused of violating these principles from 2007 onwards (Ambrose, 2018; Bousso, 2018; Code, n.d.; IPCC, 2014b; Muttitt, 2018; Shell, 2017a, 2017b; van Beurden, 2018; van Dijk, 2018; Vidal, 2014; Wetselaar, 2017).
L1.6	2011. Shell had voluntarily committed to follow External Voluntary Codes for multinational companies, including the OECD guidelines among others. The Dutch government, as an OECD member, has drawn up a Dutch version of the guidelines (version 2011) (IPCC, 2014a).
L1.7	2013. The Dutch government confirmed that a lack of climate action makes society dependent on unproven technologies, including “Bioenergy with Carbon Capture and Storage” (BECCS) (C. S. Shell, 2019).
L1.8	2014. The Dutch State Secretary of Infrastructure & Environment reported to the House of Representatives with a letter responding to the IPCC AR5 WGII report on the 17th of June 2014, outlining his concerns about the impact climate change would have on food security supplies (IPCC, 2014a; C. S. Shell, 2019).
LAYER 2 REGULATORS & JUDICIARY	
L2.1	On the 5th April 2019, Milieudefensie et al. summoned Shell and asked the court to impose the requested action on Shell (C. S. Shell, 2019). In 2019, the principal claim of Milieudefensie et al. was to ask the court to order Shell to reduce the CO2 emissions it causes and which it can control in line with the global climate target of Paris (C. S. Shell, 2019).
L2.2	5 January 2024. Nigeria’s Supreme Court ordered Shell, in November 2020, to pay 800 billion naira ($878 million) to communities of Egbalor Ebubu in Rivers state, who accused the firm of an oil spill that damaged waterways and farms. Shell was also ordered to stop the disposal of local assets last June until the Supreme Court ruling, to allow for any compensation due to the Niger Delta Community (Dzirutwe & Ohuocha, 2024). As Shell prepares to divest and leave Nigeria, it tries to avoid paying damages to the Nigerian environment for over 80 years of pumping oil from Nigeria (Laville, 2024).
L2.3	On the 26th May 2021, after considering the arguments of both sides, the court in Hague ordered Shell to reduce the CO2 emissions in its global operations by at least net 45% at the end of 2030, relative to 2019 levels (Court, 2021).
LAYER 3 ORGANIZATIONS & COMPANIES	
L3.1	Shell knew as early as the 1990s that global warming should be limited to less than 2°C to prevent a major climate disaster (Jr., 2018; C. S. Shell, 2019). Shell collaborated for 20 years with the International Petroleum Industry Environmental Conservation Association (IPIECA), which attended the UN climate conferences. Shell also collaborated with other governments such as that of the UK and Nigeria (ten Kate, 2014).
L3.2	In 2007 Shell opposed a proposal from the European Commission for the Fuel Quality Directive, designed to force producers to reduce the emission intensity of the fuels by 10% by 2020. The European Petroleum Industry Association (EUROPIA), which represented Shell and others in its lobbying practices regarding this Directive, tried to persuade the Commission to drop the 10% target (Stockman, Rowell, & Kretzmann, 2009). Shell also opposed the efficiency requirements for refineries as part of the Fuel Quality Directive and the restriction of emissions from flaring off gas because this would cost the industry too much money (Stockman, Rowell, & Kretzmann, 2009).

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L3.3	In a letter dated 4 April 2018, 7 Dutch NGOs held Shell liable for its current policy as well as claimed alignment with the climate targets under the Paris Agreement. Shell's CEO responded in a letter dated 28 May 2018, stating that their claims were unfounded, that the courts were not the appropriate forum for questions about the energy transition, and that their approach was not constructive (C. S. Shell, 2019). In 2019, 17,379 individuals and seven NGOs, i.e., Milieudefensie, Greenpeace Nederland, Fossielvrij NL, Waddenvereniging, Both Ends, Jongeren Milieu Actief, and ActionAid, issued a document appointing Milieudefensie as their legal representative (Milieudefensie, 2018). On 12 February 2019, a letter was resent to Shell's CEO Mr. Ben van Beurden, this time on behalf of all claiming NGOs. In the letter of 26 March 2019, Shell pursued its previous negative reaction of 28 May 2018 (C. S. Shell, 2019).
L3.4	1950-2024. Shell, together with the other major oil companies, carried out environmental studies often through the American Petroleum Institute (API), where Shell has long been a member. Although these studies mainly focused on discovering and extracting oil and gas, they also positioned the industry at the forefront of climate science research. As a result, the industry was aware of the connection between climate change, rising sea levels, and hurricanes as early as the 1950s (for International Environmental Law (CIEL), 2017). In a 1998 document titled "Climate Change: What does Shell think and do about it?", Shell discussed climate change and its approach to addressing it (Shell, 1998). While the company stopped short of labeling climate change as a threat, it did acknowledge its occurrence and the potential for it to worsen. Shell stated, "we don't know whether [climate change] will be catastrophic, or whether it might be slightly beneficial," but asserted that "prudent precautionary measures are now necessary." When addressing the question, "What Is Shell Doing About Climate Change?", the company first emphasized its commitment to "continue to produce oil and gas," "provide more natural gas," and "expand [Shell's] business in gas-fired power generation." Shell explained the importance of "continuing to find more [hydrocarbon] reserves" to support economic growth in developing countries over the coming decades. Additionally, Shell outlined its plans to "develop renewable energy sources" and "reduce emissions of greenhouse gases" both within the company and through the use of its products by customers (Shell, 1998).
L3.5	Shell is a member of BusinessEurope, API, Concawe, Canadian Association of Petroleum Producers (CAPP), Australian Petroleum Production & Exploration Association (APPEA), and FuelsEurope trade associations, among others. A study by InfluenceMap showed that Shell used several trade associations for its lobbying activities (C. S. Shell, 2019).
L3.6	2016. According to InfluenceMap (InfluenceMap, 2016), Shell spent $8,700,000 lobbying Congress and other federal agencies in the U.S. in 2015. Shell disclosed to the EU Transparency Register in 2015 that it spends at least $5,040,000 influencing EU policy. In 2015, Shell also disclosed a list of associated policy interests, and from analysis of this, InfluenceMap estimated that Shell spent $4,400,000 on climate-related issues on a global basis. InfluenceMap's analysis of Shell's overall engagement with climate policy for the years 2012-2015 found an annual spend of $2,500,000 on obstructive climate lobbying in the E.U. Shell's total annual EU and U.S. spend on obstructive lobbying is estimated at $4,000,000 (InfluenceMap, 2016).
LAYER 4 SHELL MANAGEMENT	
L4.1	Since 1950, Shell has been carrying out paleontological studies, mainly to find and produce oil and gas, and was aware of the role of climate change in causing rising sea levels and hurricanes as early as the 1950s (C. S. Shell, 2019).
L4.2	Shell knew in 1998 that a 450 ppm CO2 scenario would constitute an enormous reduction of the fossil fuels that were still tradeable. This is evidenced by Shell's own brochure from that time, entitled "Climate Change, what does Shell think and do about it" (March 1998) (Shell, 1998).
L4.3	In April 2017, Shell's management board announced that the fossil industry as a whole had to ensure that gas was considered a new part of the solution to the climate issue, not as a part of the problem and that the industry would be wise to actively create demand for gas: "we must relentlessly open up new markets for gas: new countries as well as new sectors" (Wetselaar, 2017).

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L4.4	In 2018, Shell lobbied for strategic goals with total expenditure upwards of 8 million dollars while it made public statements reinforcing the carbon tax in Canada and the EU through several associations and organizations it is involved in.(OpenSecrets, 2018; ThinkGeoEnergy, 2019). The support came after a willingness to invest in the electricity space which would be beneficial for upstarting. Regardless strategic goals on global Oil & Gas remained a priority through the decade 2010-2020 (OpenSecrets, 2018).
L4.5	Shell announced in January 2018 that it would focus on oil and gas from shale, the extraction of which required fracking drilling technology, an intensive process that demanded a lot of extra energy and, as such, involved higher CO2 emissions per extracted energy unit compared to conventional crude oil and natural gas. Shell wished to continue to invest in these activities "because we really want to grow this activity quickly" (van Dijk, 2018).
L4.6	After 2007, Shell's management reduced its investments in sustainable energy and increased its investments in fossil activities. In 2007, Shell purchased tar sands in Canada for $2.5bn to start extracting tar sand oil, a highly polluting substance. The year before, Shell had invested $7.4bn in Canada for the same purpose. In its 2007 annual report, Shell explicitly mentioned its ambition to become the global leader in tar sand extraction (Stockman, Rowell, & Kretzmann, 2009).
L4.7	In 2008, Shell was reprimanded by the English advertising code committee for a misleading advert in the Financial Times. In this advert, Shell said that investing in tar sand oil guarantees a sustainable future, that it is in the interest of future generations, and that it helps to fight the climate issue, even though the committee had confirmed that it would only increase greenhouse gas emissions (Hickman, 2008). The previous year, in 2007, both the Dutch and the English advertising code committees had reprimanded Shell for misleading environmental claims about the reuse of CO2 (Hough, 2007).
L4.8	Since 2007, Shell's corporate strategy has assumed that global climate targets would not be achieved, as explained by the company's management board in 2014 (Vidal, 2014). This explanation, detailed in an open letter, responded to concerns from shareholders and investors about the financial risks associated with the carbon bubble. The letter indicated that, in the absence of effective international regulations, global warming would exceed 2°C. Therefore, Shell saw no need to reduce its oil and gas activities. As the CEO stated in 2016: "I will pump up everything there is to pump up in order to meet demand" (C. S. Shell, 2019).
L4.9	In April 2017, Shell's management board announced that the fossil industry as a whole had to ensure that gas was considered a new part of the solution to the climate issue, not as a part of the problem and that the industry would be wise to actively create demand for gas: "we must relentlessly open up new markets for gas: new countries as well as new sectors" (Wetselaar, 2017).
L4.10	2017. In November 2017, Shell's management presented a climate ambition on Shell's management day. Shell planned to reduce the CO2 intensity of its combined energy products by 20% by 2035 and to halve it by 2050 (Shell, 2017a; C. S. Shell, 2019). Shell had formulated its ambition in such a way that there was no need for absolute CO2 reductions in 2050. CO2 intensity refers to the number of emissions emitted per energy unit, in this case expressed in "grams of CO2 per megajoule consumed" (Shell, 2017a). Shell's climate ambition, therefore, did not concern an absolute emission reduction based on the total emissions caused by the total of Shell's activities and products, but a relative emission reduction per energy unit (C. S. Shell, 2019).
L4.11	In 2016, 2017, and 2018, a group of shareholders ("Follow this") filed shareholders' resolutions calling on Shell's management to align its business strategy with the Paris target (Ambrose, 2024; Frost, 2024; This, 2024). However, Shell's management advised the shareholders to vote against it, as "it is not in their interests," which happened in all four successive years (Plc, 2017).
LAYER 5 STAFF	

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L5.1	1950-2019. Royal Dutch Shell always had a strong research team and research laboratory infrastructure (Shell.com, 2024). As early as the 1950s, Shell and the American oil and gas industry conducted paleontological studies on climate-related issues such as historical sea levels, temperatures, and hurricanes. Although the main goal of these studies was to locate and produce oil and gas, they also positioned the oil and gas industry at the forefront of climate scientific research (for International Environmental Law (CIEL), 2017; C. S. Shell, 2019).
L5.2	1950-2024. Shell, throughout its existence as a company, has followed and participated in committees in every nation where it operates. These committees focus on oil, gas, coal, environment, lubricants, and every other area relevant to Shell's activities. Through its presence in these committees, Shell maintains an up-to-date view and influence on every aspect of its global operations (C. S. Shell, 2019).
LAYER 6 OUTCOME	
L6.1	2007-2011. Shell's greenwashing practices misled the public, at least 3 times through ambiguous advertisements in the media. The first case in 2007, Shell advertised that waste recycled carbon dioxide (CO2) and waste sulphur being recycled in a sustainable manner, which were found to be "misleading", according to ASA (Hough, 2007).
L6.2	In 2007, Shell opposed a proposal from the European Commission for the Fuel Quality Directive, designed to force producers to reduce the emission intensity of the fuels by 10% by 2020. The European Petroleum Industry Association (EUROPIA), which represented Shell and others in its lobbying practices regarding this Directive, tried to persuade the Commission to drop the 10% target (Stockman, Rowell, & Kretzmann, 2009).
L6.3	A court in Hague in 2021 ordered Shell to reduce the CO2 emissions of the Shell group by a net 45% in 2030, compared to 2019 levels (Court, 2021). Among a series of misleading actions, SHELL disregarded its individual responsibility, which required Shell to actively effectuate its emissions reduction obligation through the Shell group's corporate policy (Court, 2021).
L6.4	Shell has been accused of not complying with the 2015 Paris Agreement, thereby neglecting the urgent climate crisis and the need to address it using the best available scientific knowledge and technologies. Critics argue that this negligence endangers human rights, the well-being of future generations, and exacerbates environmental damage caused by climate change (UNFCCC, 2015).

5.6. Chapter Discussions and Conclusions

Shell's case wasn't about the wrongdoings of just one person, but the conscious decisions of many players, including Shell's management (C. S. Shell, 2019; Wetselaar, 2017) and many of Shell's shareholders (Bousso, 2018). The issue of Shell avoiding its sustainability responsibilities after 2007 emerged when several NGOs sent letters to Shell's CEO, Mr. Ben van Beurden, asking Shell to respect the decisions of the Paris climate agreements (Milieudefensie, 2018). Shell's subsequent refusal to discuss the issue or accept the Paris climate agreements was the critical event that led Shell to the court, being accused of greenwashing (C. S. Shell, 2019).

The greenwashing aspect emerges as an outcome from several sources in the Accimap. The first group of sources is in layer 6-L6.1, where Shell has been found to mislead the public (Hickman, 2008; Hough, 2007; Masud, 2023). As discussed in L6.1, Shell was reprimanded twice in 2007 and 2008 by both the Dutch and the English advertising code committees for misleading the public. In the first case in 2007, Shell advertised that waste recycled carbon dioxide (CO_2) was used to grow flowers and waste sulfur was an ingredient in super-strong concrete, which were found to be "misleading," according to ASA (Hough, 2007). The offending advert included a picture of an oil refinery, with chimneys producing flowers and a headline that read "Don't throw anything away – there is no away" (Hough, 2007). In the second case, Shell misled the public about the green credentials of a vastly polluting oil project in Canada, where WWF (formerly the Worldwide Fund for Nature) complained that extracting low-grade bitumen from sand was highly inefficient and destroyed huge tracts of virgin forest (Hickman, 2008). In this "embarrassing" incident, ASA rejected Shell's "greenwash" because Shell used the word "sustainable" for its controversial tar sands project and a second scheme to build North America's biggest oil refinery (Hickman, 2008). In 2011, Shell was again reprimanded by the Dutch Advertising Code Committee, this time for a misleading advert in which Shell claimed that natural gas was clean and that there was enough natural gas for the next 250 years. According to the Advertising Code Committee, neither statement was true (Masud, 2023).

The second source of greenwashing comes from the decision of the court in Hague, Layer 6-L6.3 of the

Accimap. In its decision, the Hague District Court ordered Royal Dutch Shell to reduce the CO_2 emissions of the Shell group by a net 45% by 2030, compared to 2019 levels, through the Shell group's corporate policy (Court, 2021). The court's reasoning for the decision could be summarized as follows (Court, 2021):

- Shell's climate policy mainly consists of ambiguous, undefined, and nonbinding plans for the long term, specifically targeting 2050.
- These long-term plans are contingent on the global societal progress towards the climate goals of the Paris Agreement. Shell's actions depend on moving "in step with society and its customers," indicating their commitments are conditional on broader societal advancements.
- Shell lacks specific emission reduction targets for the near future, particularly for 2030. Instead, they have set an intermediate goal for 2035 through their Net Carbon Footprint Ambition (NCF).
- Shell reserves the right to adjust the speed of its energy transition based on the pace of global societal progress. If society moves slower towards climate goals, Shell's transition will also slow down.
- Shell has not sufficiently addressed criticisms, such as those from Milieudefensie, regarding their ongoing investments in new fossil fuel explorations. These investments are seen as incompatible with necessary emission reductions.
- Shell's policy reflects a reactive approach, monitoring societal developments and allowing governments and other entities to take the lead. This suggests that Shell is not taking proactive individual responsibility for reducing emissions through its corporate policy.

Another conclusion one may draw from the Accimap is the stance of the successive Dutch Governments, who, although they recognized the worsening climate in the world and the need to act (IPCC, 2014a; C. S. Shell, 2019), sometimes took actions that were helpful to Shell's endeavours for new fossil fuel markets (N. Times, 2020; van Beek et al., 2019).

Systemic factors identified in this repeated process are evident in layers 3 and 4, where the proliferation of false claims continuously needed to be challenged by the relative authorities. After 2007, the focus on fossil fuels and the reduction in sustainable energy investments in Shell's corporate strategy could be seen as a pivotal factor in the increased scrutiny it faces today. Lobbying efforts against binding renewable energy targets and in favour of gas as a transition fuel also increased the risk of being involved in greenwashing incidents in an increasingly stringent regulatory environment (Stockman, Rowell, & Kretzmann, 2009). Regulatory bodies, including the Dutch Advertising Code Committee and the Hague Court, enforced accountability through reprimands and court orders, compelling Shell to reduce CO_2 emissions (Court, 2021; Hickman, 2008; Hough, 2007). Public pressure and consumer awareness further intensified scrutiny of Shell's environmental practices (Milieudefensie, 2018).

Chapter 6
Synthesis & Accimap Meta-Analysis

6.1. Chapter Summary

This chapter follows the methodology described by Salmon et. al to synthesize a unique Accimap from a number of individual Accimaps as outlined in Section 2.7. Following this procedure, the synthesis of the three greenwashing incidents in Chapters 3-5 is outlined here. A brief explanation of the methodology is mentioned followed by the results. The aim of this chapter is to synthesize and analyze the contributory factors identified in three individual Accimaps related to greenwashing incidents and **definitively identify the common factors**. Initially, all the contributory factors of each of the three Accimaps were distributed across one of the six Accimap levels. By examining each contributory factor, they are assigned to one of the 79 codes. As a result, a set of 27 codes, each describing a synthesized event was developed and distributed across six layers. Using centrality analysis, we estimated the importance of each of the 27 nodes developed. All of the 27 codes are the new contributory factors of the new meta-Accimap developed. The results of this analysis are compared with those of Salmon et. al.

6.2. The Classification Scheme

P. M. Salmon et al., 2020 developed a generic taxonomy for Accimaps. The generic taxonomy was developed from the analysis of 23 incidents in a wide range of domains, including aerospace, led-outdoor recreation, maritime, oil and gas, public health, counterterrorism, disaster response, road transport, off-road, beach driving, civil engineering, and rail (P. M. Salmon et al., 2020). A total of 5587 contributory factors were classified into 79 thematic codes, as was shown in Table 2.2 in Chapter 2 section 2.7 (P. M. Salmon et al., 2020).

These thematic codes were used in our study to evaluate the number of contributory factors for each of the layers in the Meta-Accimap we will generate, which will reflect the synthesis of events described in Chapters 3-5. The studies included were the three Accimaps developed, all referring to the greenwashing domain, each of which analyzed an individual incident. The six main layers of the Accimap resulting from the meta-analysis of the three Accimaps were adapted to reflect the events described in Chapters 3-5, and starting from top to bottom are described as follows: Government & Authorities, Regulators & Judiciary, Organizations & Companies, Management, Staff, and Outcome.

The next step was to collect all the contributory factors for each of the six levels and add them into the unique corresponding level of the synthesized Accimap, as shown in Appendix A.1 in Table A.1. For each level, every contributory factor was allocated to one of the 79 thematic codes. For example, at the top layer of the meta-Accimap, Government & Authorities, 17 contributory factors were allocated to 4 thematic codes, as shown in Appendix A.1. The same procedure was used for all six layers. Of the 79 codes developed (P. M. Salmon et al., 2020), 27 codes were found to be of significance in the present study.

For each layer, we counted the contributory factors allocated to each thematic code. All the contributory factors of all the thematic codes were added up to calculate the total number, and the percentage of the impact of each thematic code was estimated, as shown in Appendix A.2. The first contributory factor with the highest percentage was highlighted in darker colour, for each layer. In case of a tie, both factors were highlighted.

At each layer, the thematic numbers were arranged on the synthesized Accimap layers as nodes from left to right in decreasing number of the contributing factors, as shown in Figure 6.1. Each thematic node presented on the Accimap contains its individual statistics, i.e., the number of contributory factors, the percentage contribution within the layer, and the percentage of the overall layers, as shown in Appendix A.2

It is interesting to note that thematic contributory factors were found at all six of the traditional Accimap layers, although the field of greenwashing was not one of the domains examined so far in the literature using the Accimap framework. The number of contributory factors for each of the six levels, together with its percentage contribution, is depicted in Table 6.1.

Most of the contributing factors were found at the management layer (28.6%), followed by the regulators & judiciary layer (19.0%), the government & authorities (16.2%), outcome at the fourth place (14.3%), organizations & companies at the fifth place (11.4%), and finally, the staff at the sixth place (10.5%).

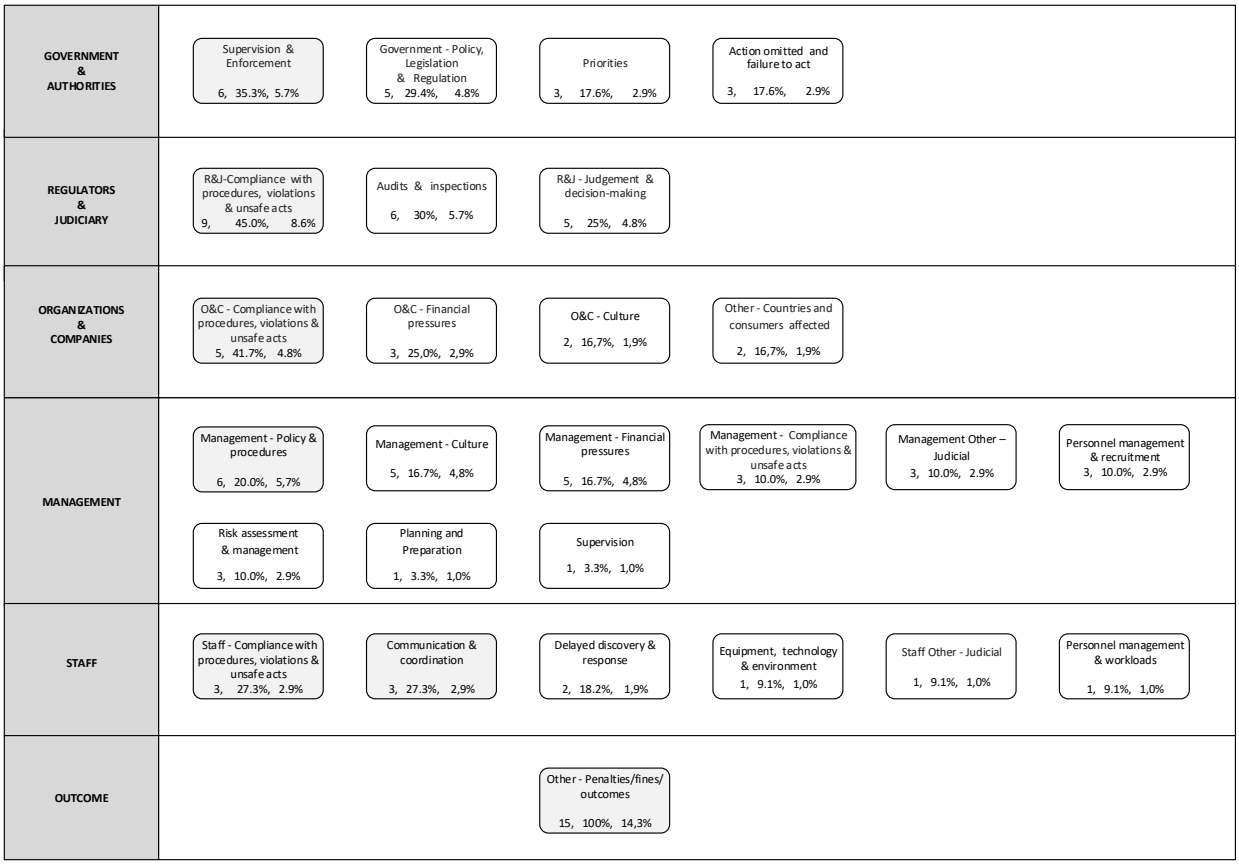

Figure 6.1: Frequency of contributory factors across the six Accimap layers. Darker colour identifies the most frequently identified contributory factors at each layer.

Table 6.1: Distribution of Contributory Factors by Layer

Layer	Contributory Factor Frequency	Percentage, %
Government & Authorities	17	16.2
Regulators & Judiciary	20	19.0
Organization & Companies	12	11.4
Management	30	28.6
Staff	11	10.5
Outcome	15	14.3
Total	**105**	**100.0**

The most frequently identified contributory factor across the overall Accimap recorded was Penalties/fines/ outcomes of court decisions, (15, 14,3%) Appendix A.2. The next most frequently identified contributory factors were “compliance with procedures, violations & unsafe acts” (9, 8.6%) at the regulators & judiciary layer. Third follows “Supervision & enforcement” at the government & authorities layer, “audits & inspections” at the regulators & judiciary layer, and “policy & procedures” at the management layer, all being equal to (6, 5.7%). At the fourth place reside “Policy, legislation & regulation” at the government & authorities layer, “Judgement & decision-making” at the regulators & judiciary layer, “Compliance with procedures, violations & unsafe acts” at the organizations & companies layer, “culture” and “financial pressure” at the management layer, all five being equal to (5, 4.8%). Together, these 10 codes out of 27 used in the present study represent 64% of all contributory factors reported in the three Accimap studies.

For each layer of the Accimap, the most commonly identified contributory factors at the top, i.e., government & authorities layer, was “supervision & enforcement” (6, 35.3%). At the regulators & judiciary layer, it was “compliance with procedures, violations & unsafe acts” (9, 45%). At the organizations & companies layer, it was “compliance with procedures, violations & unsafe acts” (5, 41.7%). At the management layer, it was “policy & procedures” (6, 20%). At the staff layer, it was “compliance with procedures, violations & unsafe

acts" and "communication & coordination," both being equal (3, 27.3%). At the bottom layer, i.e., outcome, it was "penalties/fines/outcomes of court decisions" (15, 100%).

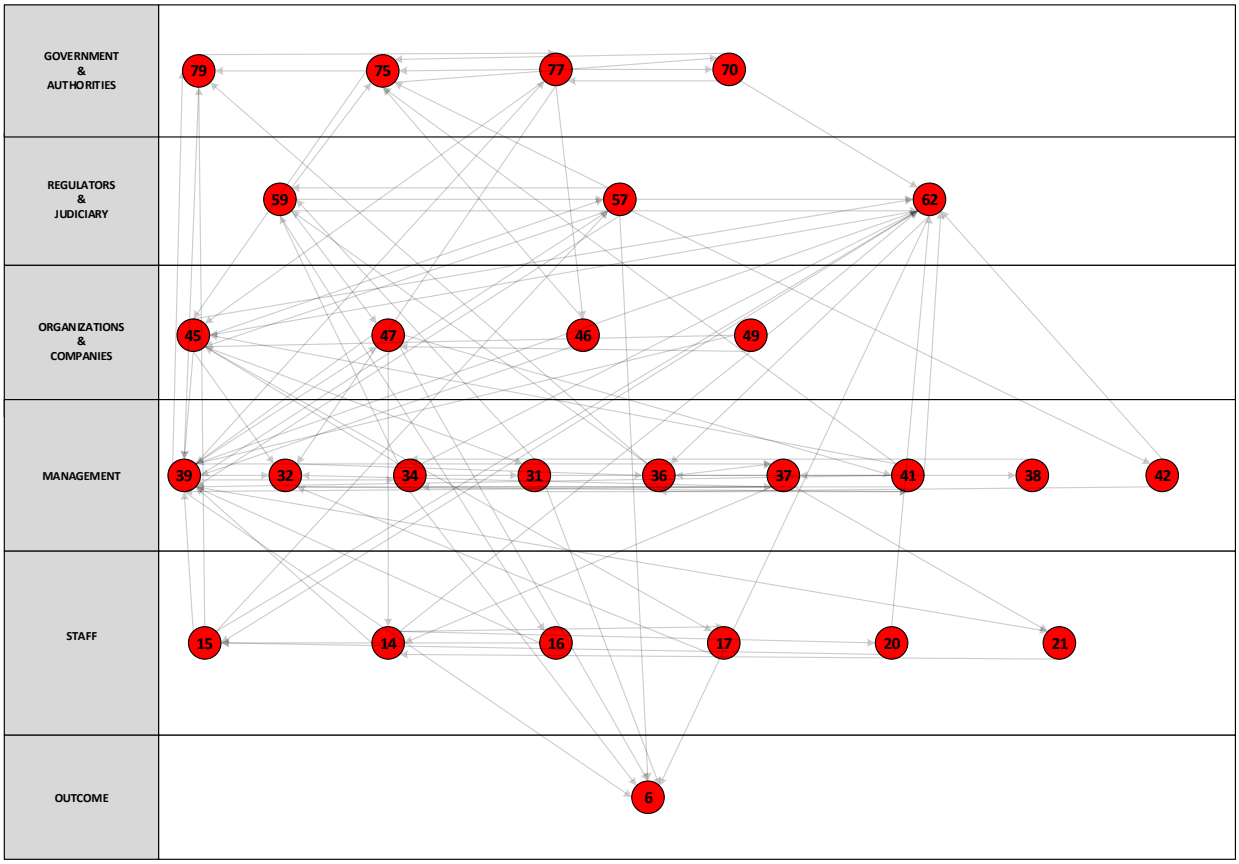

Figure 6.2: Accimap showing all contributory factors and relationships. Nodes are based on the contributory factor classification scheme presented in Table 6.2

6.3. Relationships between contributory factors

The number of contributory factors used in each of the three Accimaps is given in Table 6.2.

Table 6.2: Accimaps included in study

Name of Accimap	Incidents	Contributory Factors
Volkswagen (VW)	1	39
Deutsche Bank (DWS)	1	32
Shell	1	34

Figure 6.2 shows the relationships between all contributory factors. The nodes used in each level of the Accimap are numbered with the thematic codes following the Generic Accimap classification scheme, as shown in Table 2.2, identified for each layer of the synthesized Accimap, Appendix A.1. The same nodes, including their statistics, are depicted in Figure 6.1. The edges (connecting directed lines) were taken from each of the three Accimaps, Appendix A.1.

6.4. Social Network Analysis

In an effort to analyze deeper the connections of the nodes within an Accimap and their relationships, we used some of the methods applied by Social Network Analysis (SNA), which quantifies the connections between the nodes of the Accimap. Social Network Analysis is the process of investigating social structures through the use of networks and graph theory (Golbeck, 2015).

It uses network structures in terms of nodes (individual actors, people, or things within the network) and the ties, edges, or links (relationships or interactions) that connect them. A typical Social Network graph is shown graphically in the accompanying sketch. There are 5 actors shown in circles (nodes), all of them connected with lines (ties or edges). Any node could be connected to one or more nodes; for example, node 1 is connected to two nodes, i.e., 2 and 5, whereas nodes 2, 3, 4, and 5 are connected to 3 other nodes each.

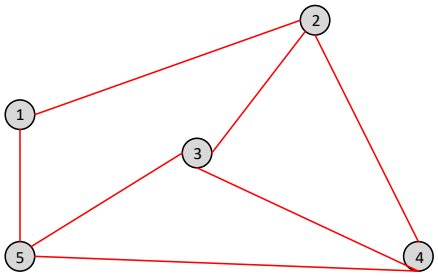

Figure 6.3: Social Network Example

Social networks have become one of the most important ways for people to spread information. The process of information dissemination in a network can be described as follows: information is sent from a node, propagated along links to its neighbouring nodes, and then gradually spread to other nodes in the network through forwarding (Chi et al., 2024).

6.5. Understanding Centrality

In SNA, degree centrality is usually the first and most straightforward centrality measure to calculate. A node's degree is the number of connections (or edges) it has. The degree centrality for a node is simply its degree. A node with 5 connections would have a degree centrality of 5. A node with 1 edge would have a degree centrality of 1. There are Social Network Analysis programs available, or SNA programs, that will convert the numbers into a 0-1 scale. In such cases, the node with the highest degree in the network will have a degree centrality of 1, and every other node's centrality will be the fraction of its degree compared with the highest-value node. For example, if the highest-degree node in a network has 10 edges, a node with 5 edges would have a degree centrality of 0.5 (5/10). In the sketch shown below, node 1 has a degree of 2 and would have a degree centrality of 0.67 (2/3) (Chi et al., 2024). For degree centrality, higher values mean that the node is more central.

In the case of a directed network, such as a graph used in Accimap, some nodes receive information and others send information or instructions. The degree centrality score can be split into two: the out-degree score, which is the number of edges from the node to other nodes (i.e., the number of people someone sends information or instructions to), and the in-degree score, which refers to the number of relationships that point to the node (i.e., the number of people who have received instructions or information from others) (Chi et al., 2024).

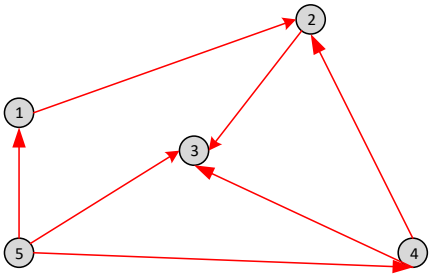

Figure 6.4: Centrality Example

The degree of centrality in this case is calculated in a similar manner as explained above. If we want to calculate the centrality degree for node 2, we see two incoming and one outgoing edge. Thus, its in-degree centrality is 2, or as a fraction 2/3, or 0.67, since the maximum incoming edges are 3, in node 3. The out-degree centrality for node 2 is 1, or as a fraction 1/3, since the maximum outgoing edges are 3, in node 5.

6.6. Centrality Analysis

Following the procedure described in Section 6.5, the in-degree and out-degree centrality for the synthesized Accimap generated was calculated, as shown in Figure 6.2. The top five nodes of the Accimap, and the results are presented in Table 6.3. The results are shown in Table 6.4. The five nodes with the highest in-degree centrality values were Policy & Procedures (Management), Penalties/Fines/Outcomes of Court Decisions (Outcome), Judgment & Decision-Making (Regulators & Judiciary), Audits & Inspections (Regulators & Judiciary), and Compliance with Procedures, Violations & Unsafe Acts (Organizations & Companies). Therefore, these five nodes were the most connected in terms of incoming relationships from other nodes, implying that they

were heavily influenced by other nodes in the network (P. M. Salmon et al., 2020).

The nodes with the highest out-degree centrality values were Audits & Inspections (Regulators & Judiciary), Policy & Procedures (Management), Judgment & Decision-Making (Regulators & Judiciary), Compliance with Procedures, Violations & Unsafe Acts (Organizations & Companies), and Risk Assessment & Management (Management). These five nodes were therefore the most connected to other nodes, highlighting their important influence on other nodes in the network.

Table 6.3: Top five nodes based on indegree and outdegree centrality analysis

	Indegree Centrality	Outdegree Centrality
1	Management: Policy & procedures	Regulators and Judiciary: Audits & inspections
2	Outcome: Penalties/fines / outcomes of court decisions	Management: Policy & procedures
3	Regulators & Judiciary: Judgement & decision-making	Regulators & Judiciary: Judgement & decision-making
4	Regulators and Judiciary: Audits & inspections	Regulators and Judiciary: Compliance with procedures, violations & unsafe acts
5	Organizations & Companies: Compliance with procedures, violations & unsafe acts	Management: Risk assessment & management

In Table 6.4 the complete results of the centrality analysis are shown with 1 being the most influential (in out-degree centrality) or influenced (in in-degree centrality) nodes. This is observable in the ”FRACTIONS” part of the table where the highest in-degree node, 22 in this case corresponding to Management: Policy & Procedures, is used to divide the rest to find the frequency of incoming arrows through the three accimaps (thus having ”1.0” in the ”FRACTIONS” column). The same goes for the outgoing arrows in out-degree centrality with 20 being the highest in Audits & Inspections. Table 6.3 reflects the top five resulting from Table 6.4.

Table 6.4: Centrality Analysis for Meta-ACCIMAP

IN DEGREE CENTRALITY							OUT DEGREE CENTRALITY					
LEVEL	1	2	3	4	5	6	1	2	3	4	5	6
1	6	9	2	4			4	7	0	4		
2	10	11	13				11	20	11			
3	11	4	3	0			10	5	3	5		
4.1	22	8	9	5	5	6	18	6	7	8	5	6
4.2	5	1	2				11	1	1			
5	6	5	1	2	1	2	4	4	3	2	2	1
6	19						1					
IN DEGREE CENTRALITY, FRACTIONS							OUT DEGREE CENTRALITY, FRACTIONS					
LEVEL	1	2	3	4	5	6	1	2	3	4	5	6
1	0,3	0,4	0,1	0,2			0,2	0,4	0,0	0,2		
2	0,5	0,5	0,6				0,6	1,0	0,6			
3	0,5	0,2	0,1	0,0			0,5	0,3	0,2	0,3		
4.1	1,0	0,4	0,4	0,2	0,2	0,3	0,9	0,3	0,4	0,4	0,3	0,3
4.2	0,2	0,0	0,1				0,6	0,1	0,1			
5	0,3	0,2	0,0	0,1	0,0	0,1	0,2	0,2	0,2	0,1	0,1	0,1
6	0,9						0,1					

6.7. A common causal network

Figure 6.5 presents the synthesis Accimap of the contributory factors, identified at each Accimap layer as well as the relationships between them identified in the above analysis.

The Government layer included factors relating to supervision & enforcement, policy, legislation & regulation, priorities, and action omitted & failure to act. The Regulators & Judiciary layer included compliance with procedures, violations & unsafe acts, audits & inspections, and judgment & decision-making. The Organizations & Companies layer included the factors: compliance with procedures, violations & unsafe acts, financial pressures, culture, and countries & consumers affected. The Management layer included the most factors: policy & procedures, culture, financial pressures, compliance with procedures, violations & unsafe acts, judicial, personnel management & recruitment, risk assessment & management, planning & preparation,

and supervision. The Staff layer included the factors: compliance with procedures, violations & unsafe acts, communication & coordination, delayed discovery & response, equipment-technology & environment, judicial, and personnel management & workloads. Finally, the Outcome layer included issues relating to penalties, fines, and outcomes of court decisions. The resulting Accimap definitively maps the common influencing factors of the three cases and showcases the causal relations between each other showing where the causation (either influencing or being influenced) is connected from (or connects to). An enlarged version is clear in Figure A.6 of the Appendix.

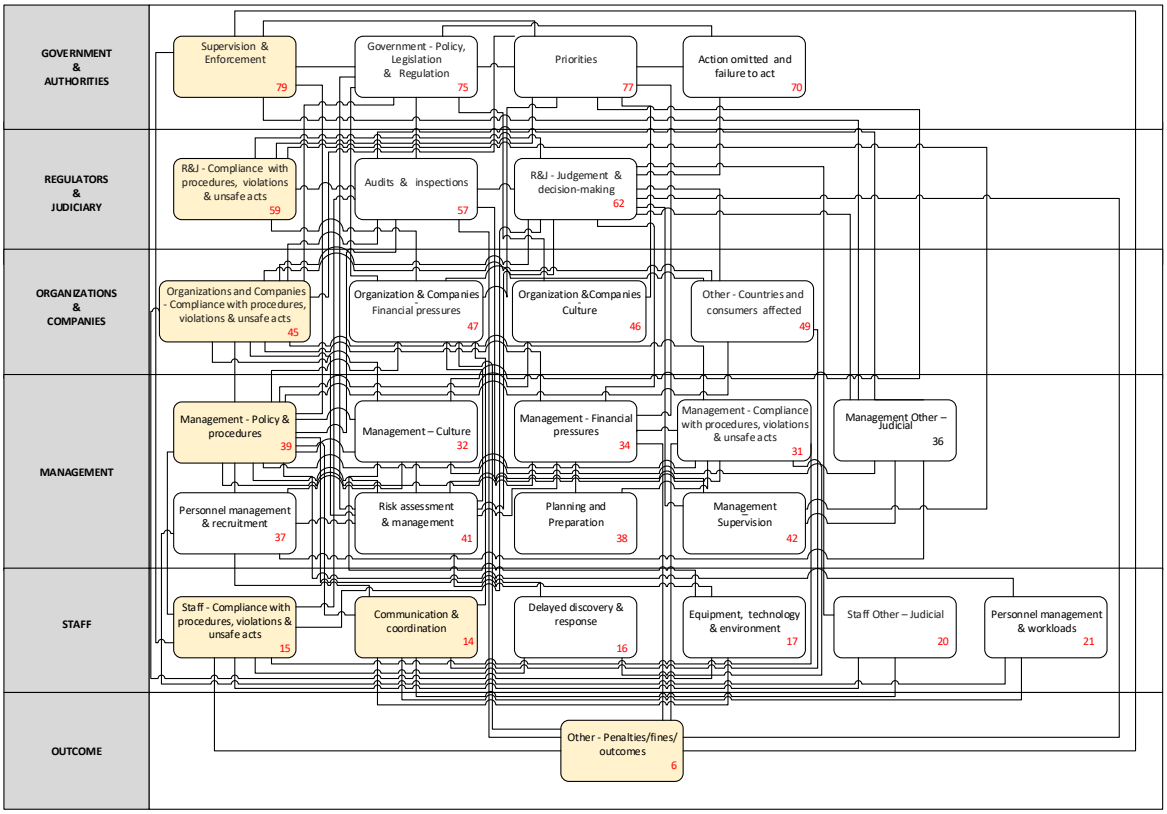

Figure 6.5: Meta Accimap - Contributory factors represented in a network including relationships between factors specified in the three Accimaps reviewed

It should be noted that the yellow boxes in this case represent the highest layer percentage similar to figure 6.1 and are sorted in descending order from left to right. The ”Management” layer is assorted from left to right again with the continuation of the order changing lines due to space issues. as such the order stopping at 36 continues on from 37, 38 etc. The ”Staff” layer had equal percentages in the layer and thus contained two yellow boxes. The clear percentages can be seen in Figure 6.1.

6.8. Chapter Discussion and Conclusions

This chapter describes the results from a study aiming to create three Accimaps for three different greenwashing incidents and then to synthesize them into one Accimap. After the analysis of the events in each of the greenwashing incidents, three distinct Accimaps were created, as presented and discussed in Chapters 3-5. Following that, in Chapter 6, we used a classification scheme developed by Salmon et al. (P. M. Salmon et al., 2020), containing 79 contributory factor types to classify Accimaps' contributory factors. Of the 79 contributory factors, we found that 27 were relevant to our study, which were used to classify a total of 105 contributory factors across the six Accimap layers: Government & Authorities (17), Regulators & Judiciary (20), Organizations & Companies (12), Management (30), Staff (11), and Outcome (15). As contributory factors were found across all six layers, these findings provide support that Rasmussen's risk management framework could be used to analyze greenwashing incidents. More specifically, our findings verify that greenwashing incidents are created by multiple contributory factors relating to the decisions and actions of multiple actors across all layers of work and society (Rasmussen, 1997). What is more interesting is the fact that although Salmon et al.'s (P. M. Salmon et al., 2020) seventy-nine (79) thematic factors were developed using 5587 contributory factors from 23 Accimaps relating to 12 different domains—none of which included greenwashing activities—it

proved to have a good application to greenwashing incidents as well (P. M. Salmon et al., 2020).

Our findings reveal that 59% of the contributory factors in our three Accimaps reside at three layers, i.e., Regulators & Judiciary, Organizations & Companies, and Management. The highest single percentage was found at the "penalties/fines/outcomes of court decisions" layer, Outcome, with a value of 14.3%. Another aspect that emerged as an important outcome property of the meta-Accimap is the significant roles of both the Government & Authorities and Regulators & Judiciary layers. However, there was a significant deviation from the average values reported by Salmon et al. (P. M. Salmon et al., 2020), where they studied the averages of existing domains of Accimap in 2020. In their landmark paper (P. M. Salmon et al., 2020), they reported average values for the two top layers of 2.18% and 2.04% respectively, whereas the present study found corresponding values of 16.2% and 19%. This reversal of importance highlights a significant difference in greenwashing. It reports the higher impact of greenwashing on the Government and Authorities, especially when the companies involved were big market players with increased gravity on the economic and labor affairs of the country, as was the case in this study. The same cannot be said for accidents, where the role of the Government was mostly limited to legislative issues.

Continuing the comparison between the two studies, we noted that the Regulatory & Judicial bodies had a more significant role in the case of greenwashing, since greenwashing is almost always accompanied by violations of regulations and laws, something that was reflected in the two values reported. Another significant difference was also noted in the role of management, where the role of management was higher in the case of greenwashing (28.6%) than in the case of an accident (7.41%). This deviation comes as no surprise, given the roles of the managements of the three companies examined in the present study, as shown by the corresponding court documents.

By examining the results of the centrality analysis of the meta-Accimap, we noted that the top node for in-degree centrality was Policy & Procedures at the Management layer, whereas for out-degree centrality it was Audits & Inspections at the Regulators & Judiciary layer. The corresponding two nodes in the Salmon et al. (P. M. Salmon et al., 2020) paper were reported to be in both cases Compliance with Procedures, Violations & Unsafe Acts, at the Physical Process and Actor Activities layer. This is indicative of where most of the action takes place in each case. In our case, where the incident refers to greenwashing activities, the Management layer is busy as most of the main actors resided in that layer, and the Regulators & Judiciary layers are busy since they house the law enforcement and the judicial authorities and courts responsible for investigating the facts and examining the incidents. In the case of an accident, the Physical Process and Actor Activities layer is the place where an accident usually takes place, and it is natural to be a very busy node in the Accimap.

From the above discussion, it becomes evident that the higher layers of the Accimap in greenwashing incidents score higher percentages in activities than the lower layers. This is opposite to the case in the Salmon et al. (P. M. Salmon et al., 2020) study, where the lower Accimap layers scored the higher percentages.

Chapter 7
Results

7.1. Chapter Summary

In the previous Chapters, the results were discussed individually with Chapter 6 being the culmination of the research. Here the collective, overall results are displayed that definitively classify the systemic factors analyzed in the thesis but also the consequentiality of each factor in terms of influence in the overall system. The aim of the chapter is to give a complete picture of the results gathered and showcase the systemic commonalities identified in the greenwashing cases. The Chapter should be read with Chapter 6 to have a holistic picture of the results as the Meta-Analysis is the implemented methodology as described in Chapter 2.

7.2. Empirical influences identified in Chapters 3-5

To fully realize and answer the sub-question posed in the introduction, to identify the systemic influences of the greenwashing cases, the several categorized contributing factors are summed and displayed in clear categories. In Table 7.1 the individual factors are displayed along with their level of influence in the several Layers of the respective maps. For each respective case the Tables 3.2, 4.2 and 5.2 are used as reference. This visualization helps in identifying the common themes and understanding the factors prevalent in the three cases. The categories observed are titled based on the specific action or event they were based on and the allocation is always based on the context.

Table 7.1: The systemic influencing factors in the three incidents

Incident	Influencing Factors
VW	VW.1 Regulatory Gaps: L1.4,L2.2, L2.1, L2.3, L2.4, L6.1, L4.7 VW.2 Lack of Rigorous Testing: L2.6, L2.7, L2.8, L2.9, L2.10, L2.11, L2.12 VW.3 Inadequate Oversight in corporate practices: L6.3, L2.5, L4.1, L6.2, L4.8 VW.4 Pressure for Competitive Advantage: L4.3, L3.4, L2.5 VW.5 Stock Performance and Investor Expectations: L4.1, L4.4, L6.6, L6.7 VW.6 Workforce Compliance: L5.1, L2.5, L6.5 VW.7 Operational Shortcomings: L4.5, L4.6 VW.8 Corporate Culture of Compliance Evasion: L4.2, L3.2, L5.3, L5.4, L5.2 VW.9 Influence of Lobbying: L1.2, L1.3, L3.1
DWS	DWS.1 Inadequate ESG Regulation: L2.5, L1.1, L1.5 DWS.2 Voluntary Disclosures: L1.2, L1.3, L1.4 DWS.3 Lack of Internal Controls: L6.2, L3.1, L4.1, L4.9, L5.2, L5.3 DWS.4 Conflicts of Interest: L4.6, L4.10, L4.9 DWS.5 ESG as a Market Differentiator: L3.1, L4.1, L4.2 DWS.6 Corporate Culture Focused on Profit Over Ethics: L4.3, L4.4, L4.5, L5.5 DWS.7 Ethical Blind Spots: L4.7, L4.11, L5.3 DWS.8 Legal Ambiguity Around ESG Claims: L2.1, L2.2, L2.3, L2.4 DWS.9 Compliance of Workforce: L5.2, L5.4, L5.5
SHELL	SH.1 Inadequate Regulatory Enforcement: L1.7, L1.8, L2.1, L2.2, L3.6 SH.2 Weak Oversight and Internal Controls: L3.5, L3.3, L4.6, L4.11, L5.2 SH.3 Pressure to Maintain Market Dominance: L3.4, L4.1, L4.3, L4.5, L4.4 SH.4 Corporate Culture of Compliance Evasion: L4.2, L4.8, L5.1, L6.2, L4.10, L2.3 SH.5 Lobbying Against Environmental Regulations: L1.3, L3.1, L3.5, L3.3, L3.2, L4.4 SH.6 Manipulation of Environmental Data: L4.9, L1.1, L1.5, L4.7 SH.7 Misleading Public Communication: L6.1, L6.3, L6.4, L3.1, L3.7

The several influences form a pattern over which specific circumstances coalesce to formulate greenwashing as a negative outcome both for the corparation but also for the general public and relevant stakeholders. The broader categories were created based on the overall theme of the cases and the events were assigned qualitatively according to the context.

7.3. Common influences in the three greenwashing incidents

Table 7.1 was created based on the individual events that transpired in each case and were categorized in umbrella terms. For example, SH.3 contains L3.4, L4.1, L4.3, L4.5, L4.4, which entail Shell's decisions and events that contributed to increased pressures for economic dominance. L3.4 for example outlines how Shell with the help of API vied for dominance in oil exploration and extraction. Similarly, the rest of the individual categories were created thematically and through observing the events and actions.

Qualitatively the main categories derived from the systemic influences that indicate increased risk of greenwashing in Table 7.1 are:

1. Regulatory Arbitrage and Compliance Gaps
2. Corporate Governance and Oversight Failures
3. Markety and Economic Pressures
4. Cultural and Ethical Norms
5. Workforce Complicity and Whistle-blowing
6. Public Perception and Investor Expectations
7. Influence of Industry Standards and Practices
8. Political Influence
9. Communication and Transparency

These categories are representative of the events and similarities between the incidents. They are derived from the individual categories of Table 7.1 and are based on the merged context of what transpired in the three cases.

As the events are listed in the overall categories, a clear picture is created of what constitutes a systemic factor and how these factors come into play in Table 7.2.

Table 7.2: Systemic Influences Categorized for Greenwashing Cases

Category	Codes
Regulatory Arbitrage and Compliance Gaps	VW.1, DWS.1, DWS.8, SH.1
Corporate Governance and Oversight Failures	VW.3, DWS.3, SH.2
Market and Economic Pressures	VW.4, DWS.5, SH.3
Cultural and Ethical Norms	VW.8, DWS.6, SH.4
Workforce Complicity and Whistle-blowing	VW.6, DWS.9
Public Perception and Investor Expectations	VW.5, DWS.7, SH.7
Influence of Industry Standards and Practices	DWS.2, SH.5
Political Influence	VW.9, SH.5
Communication and Transparency	VW.2, SH.6, SH.7

Table 7.2 definitively lists the umbrella categories that the systemic factors can be recognized in the present thesis. This allows for a clear understanding of the commonalities and recurring themes that contribute to the phenomenon of greenwashing across different industries. The similarities in the three cases drawn independently from Chapters 3-5 paint a clear picture of the systemic nature of greenwashing. Besides Listing however qualitatively the findings of this research, in Chapter 6, and are more clearly listed in Appendix A.1, Table A.1, these systemic factors are further quantified to encompass a larger and more rigorous outlook on how categorization should take place in the future should a more formal tool for identifying systemic influences in greenwashing be developed.

The above results are not based on a specific method and rather serve to list empirical observations of the contributory factors.

The Meta-Analysis conclusively elevates the conversation of common systemic factors and thus, more general conclusions can be derived for greenwashing as a systemic failure and as an agglomeration of multiple points of influence that facilitate it. This synthesis reveals how interconnected layers of governance, corporate

strategy, and market forces perpetuate the persistence of greenwashing. These insights not only provide a roadmap for mitigating the issue but also set the foundation for the practical recommendations and systemic interventions that will be explored in the following chapter.

7.4. Meta-Analysis

In an attempt to conceptualize greenwashing as a systemic consequence, and give an answer to the research question set, the meta-analysis provided a framework for formally allocating the events of chapters 3-5. Chapter 6 along with Tables A.1 and A.2 of the Appendix provide the classification scheme as well as the node statistics.

7.4.1. Connection to the qualitative analysis

As mentioned the qualitative analysis was done to create an empirical depiction of the influences, mapped in the three cases. The Meta-Analysis maps the three cases based on P. M. Salmon et al., 2020 framework, but also spreads the overall categories shown in Table 7.2 through the layers of the map. the expansion of Table 7.2 is seen in Table A.1 as the events are now added to the layers instead of the umbrella categories identified. This addition of the extra dimension opens up a new pathway for conceptualizing greenwashing as a systemic common consequence of decisions made on the multiple levels of the system.

As an example, Workforce complicity and greenwashing is now spread into: ”Compliance with procedures, violations & unsafe acts (Management)”, ”Compliance with procedures, violations & unsafe acts (Staff)”, ”Personnel management & recruitment”, ”Culture (Organizations & Companies)”, ”Action omitted & failure to act(Government & Authorities)”, ”Delayed discovery & response(Staff)” etc. These codes can overlap with other categories of Table 7.2 which is a testament to the complexity of Greenwashing.

7.4.2. Comparative analysis to P.M. Salmon et al., 2020

In Table 7.3 the comparison to P. M. Salmon et al., 2020 is made to expand on from the chapter discussion made in Section 6.8.

Table 7.3: Layer-wise Contributory Factors and Percentage Comparison to P. M. Salmon et al., 2020

Layer	Contributory factor frequency	Percentage, %	Salmon et al., Percentage, %
Government & Authorities	17	16.2	2.18
Regulators & Judiciary	20	19.0	2.04
Organization & Companies	12	11.4	4.47
Management	30	28.6	7.41
Staff	11	10.5	53.55
Outcome	15	14.3	30.34
Total	**105**	**100.0**	**99.99**

Throught this depiction of the individual research results it is derived that the conventional ”Accidents as analyzed by Salmon tend to carry more weight on the ”Staff” and ”Outcome” layers due to the involvement of workers and the surrounding environment. In Greenwashing as a systemic failure, the highest percentage is allocated to the management layer and to the regulator’s level showcasing how greenwashing stems from decisions made on these levels.

In Chapter 8 a more thorough discussion of how greenwashing compares to conventional accidents is portrayed.

7.4.3. High-level results from Chapter 6

As mentioned, Chapter 6 contains the collective results of the Meta-Analysis of the three Chapters and is a results chapter as well. Continuing on from the comparison a simplified version of Table A.2 is showcased in Table 7.4 where it should be viewed together with Figures 6.2 (The Spider diagram of causal relationships & traffic) and 6.5 the Meta-Accimap.

The density of interactions is mapped in Figure 6.2 (Spider Diagram) and showcases the overall traffic in the nodes which is later analyzed further in the in-degree and out-degree centrality in Table 6.4 (Centrality Results).

The events inside each code are also displayed in Table 7.4 and represent the various allocated codes from the three cases shown in Table A.1 of the Appendix.

The contributory factor's percentages are one of the high-level results of the study, as they indicate the weight of each layer. Table 6.1 (Percentage contributions Map) gives the overall weight of the layers. Finally, Table 7.4 further expands on the layers.

Table 7.4: Contributory Factors by Layer

No.	Code	Layer %	Accimap %	Events
	Outcome			
6.	Other- Penalties/fines /outcomes of court decisions	100.0	14.3	15
	Staff			
14.	Communication & coordination	27.3	2.9	3
15.	Compliance with procedures, violations & unsafe acts (Staff)	27.3	2.9	3
16.	Delayed discovery & response	18.2	1.9	2
17.	Equipment, technology & environment	9.1	1.0	1
20.	Other-Judicial (Staff)	9.1	1.0	1
21.	Personnel management & workloads	9.1	1.0	1
	Management			
31.	Compliance with procedures, violations & unsafe acts (Management)	10.0	2.9	3
32.	Culture (Management)	16.7	4.8	5
34.	Financial pressures (Management)	16.7	4.8	5
36.	Other- Judicial (Management)	10.0	2.9	3
37.	Personnel management & recruitment	10.0	2.9	3
38.	Planning & preparation	3.3	1.0	1
39.	Policy & procedures (Management)	20.0	5.7	6
41.	Risk assessment & management	10.0	2.9	3
42.	Supervision	3.3	1.0	1
	Organizations & Companies			
45.	Compliance with procedures, violations & unsafe acts (Organizations & Companies)	41.7	4.8	5
46.	Culture (Organizations & Companies)	16.7	1.9	2
47.	Financial pressures (Organizations & Companies)	25.0	2.9	3
49.	Other- Countries and consumers affected	16.7	1.9	2
	Regulators & Judiciary			
57.	Audits & inspections	30.0	5.7	6
59.	Compliance with procedures, violations & unsafe acts (Regulators & Judiciary)	45.0	8.6	9
62.	Judgement & decision-making	25.0	4.8	5
	Government & Authorities			
70.	Action omitted & failure to act	17.6	2.9	3
75.	Policy, legislation & regulation	29.4	4.8	5
77.	Priorities	17.6	2.9	3
79.	Supervision & enforcement	35.3	5.7	6

A result of Tables 7.4 and 6.1 (Percentage Allocation by Layer) is the realization that the Management layer is mostly responsible for decisions resulting in greenwashing, with Regulatory and Judiciary as a close second. The identification of the layer densities structured the Meta-Accimap as is depicted in Chapter 6.

The resulting Meta-Accimap in Figure 6.5 is the most pivotal result of the thesis as it maps out the interactions between the commonalities in the three cases. This depiction reveals the interconnectedness of the nodes in facilitating greenwashing. Each node is influenced or is influencing the other through a causal connection as depicted in the Meta-Accimap. As P. M. Salmon et al. (2020) is proposing the various "leverage points" are made clear and indicate how small changes can affect the system at large. It should be noted that the Meta-Accimap should be seen in conjunction with the centrality analysis to target the most influenced and influential nodes as well as their causal connections.

Chapter 8
Discussion

8.1. Chapter Summary

In the previous Chapters, the results were discussed individually with Chapters 6 and 7 outlining the several results of the thesis. The Objective (*"To identify, and analyze the common systemic influences contributing to greenwashing from three high-profile incidents in various industries."*) will be discussed here and link the nine resulting categories to greenwashing research. Additionally, in this Chapter, the conceptualization of greenwashing as a systemic failure will be linked with the Meta-Analysis to further explore its systemic character through the events and results outlined in the previous Chapters.

8.2. Explanations of Qualitative Results

The nine categories identified from the chapters and mentioned in Section 7.3 are analyzed here and discussed individually. The independent research on greenwashing done in each category is linked to the findings identified empirically and discussed in the context of the events that transpired.

Regulatory Arbitrage and Compliance Gaps. Regulatory arbitrage occurs when companies exploit inconsistencies in environmental regulations across different jurisdictions, allowing them to engage in greenwashing while appearing compliant. These gaps allow firms to navigate around stricter regulations by shifting operations to regions with more lenient standards, as seen in VW's exploitation of emission testing methods between the U.S., who only had stationary testing, and the EU whose independent testing was nonexistent. Similarly, the absence of clear ESG definitions enabled DWS to falsely market its investment products as sustainable, while Shell's misleading advertisements in the UK and the Netherlands highlight the lack of enforcement power to curb such practices. These examples underscore the need for harmonized global regulations and robust enforcement mechanisms to prevent the continued exploitation of regulatory gaps. The result in all three cases was that the companies continued to greenwash. In a study by Muigua, 2023 the articulation of a greenwashing definition needs to first be established, before setting up a regulatory worldwide framework. This is also echoed Lagoarde-Ségot, 2024, who argues that systemic greenwashing in sustainable finance arises partly due to these regulatory discrepancies, which create opportunities for firms to misrepresent their environmental credentials. To address this, researchers propose the harmonization of international environmental regulations and the implementation of stricter compliance monitoring to reduce the incidence of greenwashing.

Corporate Governance Failures. Failures in corporate governance and oversight mechanisms are critical factors that contribute to greenwashing. When internal controls are weak, companies may engage in unethical practices without facing significant repercussions, since the very decision-making process is poised to evade and exploit regulations. All three companies failed to enforce proper control, both to their staff and the management, and allowed greenwashing activities to emerge, e.g., VW failed to prevent the decision to implement a cheating emissions device in millions of cars worldwide. DWS had no practical control mechanism in place and allowed the ESG overstatement. Shell, after 2007, set as a company priority the fossil fuels, despite their deep knowledge of their negative environmental impact. This was a failure of corporate governance. Vangeli et al., 2023 emphasizes that preventing greenwashing entails transparent reporting processes, independent audits, and strong board oversight to ensure that environmental claims are accurate and reflect genuine sustainability efforts. Glavas, Grolleau, and Mzoughi, 2023 has also suggested that incorporating sustainability metrics into executive compensation could align corporate goals with environmental responsibility, thereby reducing the likelihood of greenwashing.

Market and Economic Pressures. The offset condition in all the three cases was that financial pressures, either to maintain or increase their market position, led them to greenwashing actions. For instance, VW installed a cheating device in their cars to bolster their market share in the U.S. and ultimately become the leader in VW car sales. Similarly, DWS, under market pressure to attract more customers to their ESG products, exaggerated their sustainability profile. Shell, with a strong market presence rooted in fossil fuel extraction, continued these practices while simultaneously engaging in misleading sustainability claims to protect

or advance their market position. These practices are hence not unique to these companies and, therefore, could very well be indicative of a broader, more systemic issue with competitive markets. According to Vangeli et al., 2023, high competitiveness in sustainability-led markets encourages firms to exaggerate their real level of sustainability in order to win a market share and attract the environment-conscious consumer. (Y. Liu et al., 2023) underline that such market forces drive firms to focus on short-term financial benefits at the cost of authentic care for the environment in the long term, thereby promoting greenwashing practices at large. Pressures exerted by these systemic forces are combined with regulatory failures, as Bodellini, 2023 pointed out, when speaking about misapplications of financial regulation, such as SFDR, which allows firms to window dress sustainability disclosure in a bid to attract investment. Together, these insights suggest that the greenwashing actions of VW, DWS, and Shell are deeply embedded in the market dynamics that prioritize financial performance over environmental integrity. The literature underscores the urgent need for stronger, harmonized regulatory frameworks and rigorous oversight to address these systemic issues, ensuring that sustainability claims are both credible and verifiable, and reducing the incentives for companies to engage in greenwashing.

Cultural and Ethical Norms. A common factor in all three companies was a lack of cultural and ethical norms. In companies, greenwashing can also be further encouraged by the corporate culture and ethical atmosphere. As Glavas et al. state, ”cases of greenwashing are more likely to occur in companies where making a profit is the key to business rather than following ethical values” (Glavas, Grolleau, & Mzoughi, 2023). This is supported by research from Pedersen, who argues that strong ethical culture works as a barrier to greenwashing by creating an environment where transparency and truthfulness become instinctive. As a matter of fact, this research adds, organizations should invest in ethics training and establish proper policies emphasizing sustainability in their corporate identity and not for marketing purposes (Pedersen, 2023). In the case of this thesis, VW exhibited a culture of non-compliance, either to legality or ethics. This ran across the whole corporate structure since the only target was for the company to become number one in car sales in the USA. The culture that existed in DWS was that above everything, the firm’s target was its financial performance. This is more or less what Ms. Fixler said to the executives during her presentation and asked for changes, which led to her being fired. In Shell’s case, corporate culture was a continuous struggle to avoid genuine sustainability. Misleading advertisements and continuous investment in fossil fuels indicate a deep corporate ethical failure. As Glavas, Grolleau, and Mzoughi, 2023 corroborates in all three cases company profits were key, thus subduing ethical norms and undermining genuine sustainability efforts. As shown in the Accimaps, workforce complicity and also the EU’s failure to protect whistleblower elements, led to a culture of fear in the workforce that would allow the proliferation of unethical practices and greenwashing(European Parliament and Council of the European Union, 2019; Pedersen, 2023).

Workforce Complicity and Whistle-blowing. As discussed above a major commonality in the three firms was the workforce’s silent acceptance and turn-a-blind-eye behavior to the wrongdoings of their company. Workforce complicity and the fear of retaliation often prevent employees from reporting greenwashing practices. The Fixler Incident, highlighted in Y. Liu et al. (2023), illustrates how employees may remain silent due to the fear of losing their jobs or facing other forms of retaliation. To address this, the research proposes stronger whistleblower protections and the creation of anonymous reporting channels within organizations. The EU has also failed spectacularly to implement basic whistleblower laws up until 2019 (European Parliament and Council of the European Union, 2019), but also even today the member states haven’t implemented robust protection frameworks(Terracol, 2022). Pedersen (2023) also suggests that fostering a corporate culture where ethical behaviour is rewarded rather than punished can encourage employees to speak out against greenwashing, thereby reducing its prevalence. In VW, everybody was aware of what was going on inside the company but kept quiet for fear of being fired if they spoke out. Managers and executives were having meetings and presentations inside the company regarding the cheating device. The engineers played a key role as they assisted in installing the cheating software on the car engines. The teams inside DWS who were handling the ESG statements knew the deviation from the public claims of sustainability made by DWS, but nobody talked about it. Had it not been for the incident with Fixler, the issue wouldn’t have surfaced and become public (Y. Liu et al., 2023). Again, the basic issue was fear of being fired from the company. In Shell’s case, whistle-blowing came from a group of investors and outside NGOs, not from its employees, however, it highlighted years of systemic complicity in all levels of government, to regulators, to top and operational management and research staff. particularly for Shell, it has been reported that operations in Nigeria, specifically in the Niger Delta, were deeply entangled with systemic collusion between the oil company and local government authorities, facilitating resource exploitation at the severe expense of environmental and human rights. Regulatory agencies either turned a blind eye to Shell’s misconduct or actively colluded with the company to shield it from accountability (Krishnan, 2020). In the absence of internal whistle-blowing, a corporate culture emerged within Shell that prioritized profit over ethics and swiftly responded to any form of dissent was argued by Brooks, Thorslund, and Bi (2023). This culture was rooted in systemic issues within the company, where operational and research staff were either directly complicit or willfully ignorant of the unethical prac-

tices they were perpetuating. An analysis by Singh (2022) reveals that Shell's complicity was not confined to local entities but extended throughout its global management structure. Decisions made at the highest levels were systematically implemented across all operations without sufficient ethical oversight or controls. The involvement of external whistleblowers serves as a critical example of how systemic complicity within powerful corporations like Shell can be disrupted and exposed (Ajibo et al., 2021; Krishnan, 2020).

Public Perception and Investor Expectations. Public perception and investor sentiment is a double-edged sword that companies are called to deal with when it comes to sustainability. Aggressive marketing campaigns, public declarations, and misleadingly green claims at VW, DWS, and Shell are core strategies in the manipulation of public perception to achieve high investor expectations. At VW, they marketed the vehicle as 'green,' which was highly advertised and emphasized by the senior management, elevating the market share and satisfying investors' demands for robust fiscal performance. Similarly, DWS used the increased interest in sustainable investment as a way to publish a "Responsible Investment" declaration and commit to ESG principles in public. This helped to portray the firm as a leader when it comes to sustainable investing and garnered large capital inflows. As environmental campaigners increased pressure on its environmental performance, Shell ran a disinformative campaign that greatly exaggerated the group's prospects about sustainability; this was to promote investor confidence in a bid to help stem the fall of its share price. This greenwashing was eventually exposed, however, and led to a profound loss of trust among all three companies, which entailed severe consequences at the level of public perception and investor confidence. The result was biting: VW had to face a steep decline in market share; DWS lost its reputation as a sustainable investment leader; and for Shell, its reputation took a dent as its stakeholders began to realize that their environmental claims were far from serious. The loss of trust from these cases is profound. The research underlines that these are not phenomena that have short-duration effects. According to Schwertner and Sohn (2024), when greenwashing is exposed, investors may react with everything from a complete withdrawal of support to their just being a bit more careful, ultimately creating spillover from trust erosion regarding the company's integrity in general. As purported by Torelli, Balluchi, and Lazzini (2020), in case the stakeholders view the corporate communication as untruthful, it is said to have an adverse impact not only on the reputation of the business/organization but also on the financial performance of the organization. According to Salo (2020), in more detailed information, it is said that trust due to greenwashing isn't easily recovered, making the reputational and investor confidence erosion long-term in nature. These studies, taken together, underline how companies such as VW, DWS, and Shell have first gained—perhaps only for a short while—from misleading the public and investors but, upon exposure, faced significant and long-lasting reputational and economic burdens.

Influence of Industry Standards and Practices. A common approach for the three firms has been influencing the regulations and standards concerning their industries' operations and obligations, written by the state. VW, through its membership in ACEA (European Automobile Manufacturers' Association), is always present at the heart of the EU's European Committee for Standardization (CEN). ACEA's influence is heavy on the EU's norms regarding the auto industry worldwide. DWS and its parent company, DB, exert significant influence on state and EU regulations regarding banking legislation. Shell, through such affiliations as CONCAWE (European Refineries), Fuels Europe (European Fuel Companies), and EUROPIA (The European Petroleum Industry Association), is ever present in the EU, USA, and Japan, where national or international regulations are written concerning fuel regulations, emissions, oil platforms, etc. Moreover, all the firms have a presence in the UN, World Bank, etc., as affiliate members, observers, etc.

Recent research underscores the problematic nature of such influence. Mateo-Márquez and González-González (2022) examine the international impact of regulatory pressures and reveal that when industries have significant sway over the creation of standards, it often leads to greenwashing practices, as companies can ensure that regulations favor superficial compliance. Huang, Xie, and Zhou (2022) discuss the concept of "isomorphic behavior" in industries, where companies mimic each other's practices to appear compliant with environmental standards, while in reality, they contribute to the systemic issue of greenwashing. This mimicking behavior is exacerbated when industry standards are shaped more by corporate influence than by genuine sustainability goals. Similarly, Ruiz-Blanco and Romero (2022) find that the voluntary nature of many industry standards often lacks the rigor needed to prevent greenwashing effectively, calling for the development of mandatory, sector-specific standards that are coupled with regular third-party audits to ensure compliance.

These studies suggest that while industry influence on standards and regulations is a common practice, it can lead to the perpetuation of greenwashing.

Political Influence. Recent research highlights the significant impact of political influence on corporate greenwashing and environmental regulation. He et al. (2020) show that corporate political lobbying often aligns with a company's public relations strategies to create an illusion of corporate social responsibility (CSR), which can be misleading and contribute to greenwashing. This strategic alignment allows companies to present themselves as environmentally responsible while their lobbying efforts work to weaken or resist stricter envi-

ronmental regulations. In the cases analyzed here, political influence was a routine behavior. As the events have shown, when the VW emission incident emerged, the German Government intervened all over the world through its foreign missions abroad, asking its personnel to protect the “made in Germany” brand. A few months later, Chancellor Merkel of Germany, on a trip to China, took with her the new VW CEO to protect the company’s interests in China (Financial Times, 2022). According to the German press, VW’s management—and the management of other influential companies—have preferential treatment from the government(Taylor, 2011). DWS and DB are also considered one of the pillars of the German economy. As such, they can be considered an integral part of German political life. Shell also had close ties with the Netherlands’ successive governments. Together they joined forces in the 1960s and developed the extraction and distribution of Groningen gas. Moreover, Dutch governments intervened abroad to secure Shell’s business position abroad. Kolcava (2022) argue that public demand for government regulation increases when firms are exposed to greenwashing, particularly in scenarios where corporate lobbying has been used to prevent enforceable legislation. This has been more apparent in Shell’s case in Nigeria as the devastated landscape left behind after years of collusion with the local government was met with public outcry for restoration efforts. Finally, J. Liu, Zhang, and Chen (2024) find that political connections can significantly exacerbate greenwashing behaviours, as firms with strong political ties are more likely to engage in practices that mislead stakeholders about their environmental performance. These systemic factors perpetuated the behaviours with impunity and showcased how leveraged regulators can struggle to enforce legislation with conflicts of interest and other influences.

Communication and Transparency. Communication and transparency were fields where in their absence, greenwashing assumes a generic and natural character.Yoganandham, Kareem, and Khan (2024) found that corporate greenwashing is often facilitated by strategic communication that deliberately misleads stakeholders about a company’s actual environmental impact. They argue that without transparency, companies can easily manipulate public perception, making greenwashing a normalized practice within industries. VW’s CEO, after the incident made headlines, talking to the press before his resignation, insisted that the whole incident was due to some employees’ rogue behaviour. Before the US court received all the VW documents relating to the incident, VW employees destroyed thousands of documents. In the case of DWS, when Fixler made a presentation asking the DWS executives to state through ESG their investment assets as they promised in their advertisements and public statements, she was fired. In the meantime, irrespective of what the DWS CEO stated in the media about sustainability, their main effort was the firm’s financial performance. Cimasa (2019) highlights that such retaliatory actions are common in companies seeking to protect their financial interests and maintain a positive public image. This influence closely corresponds to developing a transparent company culture and resonates strongly with a systemic category analyzed above, but also implementation of third part oversight as mentioned above as well. Finally, Shell also faced difficulties as it got deeper involved with the extraction, refining, and sales of fossil fuels. On the communication side to the general public, Shell was trying to persuade people that everything it did was sustainable. As a result, Shell was reprimanded by both the British and Dutch authorities for misleading the public. Keilmann and Koch (2024) conducted a study on the impact of misleading environmental claims and found that when companies lack transparency, the resulting greenwashing can severely damage their reputation and credibility. Shell’s loss of credibility after the court decision but also as a result of the unethical practices in its history, has alienated young talent, investors and governments from engaging with the company.

8.3. Meta-Accimap Contributions

The conceptualization of greenwashing as a systemic issue can be directly seen in Table 7.4 of the results, as it outlines the weight of each decision made at the levels. Coupled with the various stakeholder maps a discussion over responsibility can be generated.

In Chapter 6 , section 6.7 and Table 6.1, it was noted that the role of management in the meta-Accimap of greenwashing incidents was significantly higher (28.6%) than in typical accidents (7.41%) (P. M. Salmon et al., 2020). This aligns with research by W Zhang (2023), which highlights that greenwashing often stems from strategic choices made by top management. In companies where leadership prioritizes financial performance and market positioning, greenwashing can become a deliberate strategy to enhance the company’s image without committing to genuine sustainability efforts. The study emphasizes that the characteristics and decision-making processes of top management teams significantly influence whether a company engages in greenwashing. As discussed in Chapter 6, the meta-Accimap in the Management layer identified factors like financial pressures and company culture, which also appeared in the Organizations & Companies layer, indicating their significance.

Further drawing from the centrality analysis, however, the Code ”Management: Policy & Procedures” is seen to have the highest in-degree centrality, indicating that it’s the category with the most outside influence. This can attest to the fact that Top management policies are a product of the general playing field of regulatory gaps and player dynamics. This view is supported by the fact that ”Regulators and Judiciary: Audits & inspec-

tions" has the top spot in out-degree centrality meaning that it predominantly influences the system from its decisions. The second code with the most out-degree centrality is "Management: Policy & Procedures" which means it is the second most influential category in the system. By taking into account Table 6.1, the broader responsibility is allocated in the layers of Management, Regulators & Judiciary ,Government & Authorities with a collective 63.8% of the contributory factors. This brings to light the systemic character of greenwashing as it is a collection of multiple decisions on multiple levels that enable it, but it also highlights how predominantly management decisions are the ones that allow it to proliferate. This should however be discussed along the "Regulators and Judiciary: Audits & inspections" code that influences the system, pertaining to the fact that not enough controls have been set to check greenwashing as a consequence.

In Table 6.3, "Regulators & Judiciary: Judgement & decision-making" is also the third most influenced (in-degree centrality) and influential (out-degree centrality) node, pertaining to the fact that courts are major stakeholders in allocating responsibility for greenwashing. This is a clear example of a "Leverage Point" as outlined by P. M. Salmon et al. (2020) as the bottleneck for mitigating greenwashing. This mainly stems from a system that works reactively to greenwashing cases as outlined by Omazic (2024) and also shown in the analysis. A proactive approach to mandate self-regulation with stricter audits would alleviate the pressure from the courts. Additionally through cultivating a market culture of "shaming under conditions" as asserted by Taebi and Safari (2017), a role of the "social judiciary" could be formulated, although the ethical pitfalls of such an approach should be considered in avoiding mob rule.

Generally, the entire Regulators & Judiciary layer can be seen as a "Leverage point" due to the high amount of traffic in the entire layer. All three nodes appear in high centrality both inwards and outwards, indicating the need for a separate authority that deals with greenwashing and green legislation/litigation. A dedicated greenwashing oversight body would be responsible for reviewing and adjudicating claims before they reach the court system, helping to offload some of the traffic currently managed by general regulators and the judiciary(Pellus, 2014).

Finally, the Meta-Accimap reveals that "Organizations & Companies: Compliance with procedures, violations & unsafe acts" is the fifth highest most influenced node and causally relates to multiple factors and influences, further pointing to the fact that Corporate Compliance and violations are reactive to greenwashing incidents and that violations stem from a multitude of depicted causal connections(Omazic, 2024).

8.3.1. Comparison to P.M. Salmon et al., 2020

Table 7.3 highlights some important differences between the results of the present thesis and those of P. M. Salmon et al. (2020) work. At the first layer one sees a percentage of 16.2 for greenwashing, contrasting with 2.18% for accidents. In an effort to unearth the causes for this difference, when it comes to greenwashing one encounters in the case of VW, the German Government's frantic involvement to protect the "made in Germany" brand worldwide as a result of the scandal (Gude et al., 2015), rather than to protect its affected citizens. In the case of DWS/DB since they are the largest banking system in Germany, they have a preferential treatment within German politics. Shell also had close ties with the Netherlands' successive governments and Dutch governments sometimes were helpful to Shell's business for new fossil fuel markets (N. Times, 2020; van Beek et al., 2019). On the other hand, Government and Authorities in case of accidents, have no influence as their role is limited to legislative issues.

The second layer, Regulators and Judiciary, has a high value in this thesis, 19%, whereas in the case of accidents its value is 2.04%. In all the three cases examined here, the Judiciary had a very active and high-profile role. In the case of VW, successive court trials plus the Department of Justice in the USA and in many parts of the world were involved, either in huge fines or other forms of punishment. On the other hand, the role of the judiciary in accidents, although important, has less overall involvement.

The next two layers, Organization & Companies and Management, both have higher values in the meta-Accimap, 11.4% and 28.6%, as opposed to 4.47% and 7.41% for accidents. Again, the company and management involvement in greenwashing is much higher than for accidents. One should contrast the VW and the DWS managerial involvement, which led to both CEOs being fired for their actions, as opposed to the case of accidents.

The last two Meta-accimap layers tell a different story. The corresponding percentage values for Staff/Outcome are 10.5% / 14.4% in the thesis and 53.34% / 30.34% respectively. This behaviour is to be expected since in accidents it is the Staff/Outcome who are more actively involved in most cases. In conventional accidents, P. M. Salmon et al. (2020) work revealed that over 80% of the contributory factors reside at the "sharp-end" of system operation, i.e. the physical processes and actor activities and equipment & surroundings levels.

This leads to an important conclusion regarding the two studies. Whereas in "conventional" accidents the main accident events take place at the last two layers, in the meta-accimap of this thesis, the four top layers are mainly responsible for the greenwashing. Specifically, the Layers of Management, Organizations

& Companies, Regulators & Judiciary and Government make up almost 80% of the systemic contributions in greenwashing in comparison to 80% of P. M. Salmon et al. (2020) residing in the Physical processes and Environment (respectively Staff & Outcome in this study). This suggests that ”greenwashing” is primarily a systemic issue driven by higher-level organizational, regulatory, and governmental influences rather than operational failures or individual staff actions, unlike conventional accidents, where human error or environmental factors at the operational level are often the primary contributors.

In the case of conventional accidents, P. M. Salmon et al. (2020) indicate improvements in personnel training, experience, and competence of supervisors and managers, risk assessment & management, and government policy, legislation, & regulation as key leverage points. In the present thesis, the remediation process ought to concentrate mainly on changing regulatory handling as well as creating sound policy & procedures for top management.

8.3.2. Greenwashing as a systemic consequence

The multifaceted nature of greenwashing was explored throughout the thesis. An interplay of factors that facilitate its existence came to light with the nine categories explained in sections 7.3 and 8.2 and expanded with Chapter 6 analysing 27 codes that express common denomination of the events. The resulting connections in the Meta-Accimap (Figure 6.5) reveal a deep network of interdependencies and reinforcing mechanisms that span across various actors and levels of the socio-technical system. These interdependencies indicate that greenwashing is not only perpetuated by individual corporate entities but is sustained by the mutually reinforcing dynamics between regulatory bodies, market demands, technological systems, and societal expectations. These aspects all underscore that **greenwashing must be seen as a symptom of broader systemic failures.**

While the character of which it manifests has been explored by de Freitas Netto et al. (2020) the source of the manifestations indicated in this thesis spans throughout the societal, technical, regulatory and economic levels comprising the socio-technical systems. Examples of the above statement can be seen in the VW defeat device scandal, where all these aspects came together. Technology was innovatively used to facilitate a guise of regulatory compliance, while at the same time ascertaining financial gain. The societal impact was profound as the general public had to deal with the consequences of cars that were being decommissioned for emissions fraud. The same with DWS which took advantage of ESG laws and a lack of regulatory Audits to maintain non-sustainable portfolios. Shell finally with the use of several mechanisms (technology research and lobbying) misrepresented its emissions for financial gain and was prosecuted on the basis of not taking into account societal well-being.

8.3.3. Culture of Greenwashing

A major factor appearing in the Meta-Analysis is the culture of fear cultivated in the management and staff layers. This complicity comprised of fear of career loss and ignorance of the consequences of company operations led to ”Management: Culture” being the second most common contributory factor in the ”Management” layer with 16.7% layer contribution and 4.8% overall contribution in the Accimap. This positions company culture as pivotal to ascertaining internal checks & balances within the company. The Meta-Accimap in figures 6.5 and A.6 directly connects ”Management: Culture” to ”Risk Assessment and Management” as well as ”Organizations and Companies - Compliance with procedures,violations & unsafe acts” thus correlating Organizational compliance with Management culture.

The Culture inside the VW Group

The best way to describe the culture inside the VW company before “dieselgate” became known in 2015, is to follow an article from Fortune Magazine (Smith & Parloff, 2016). In this article, Fortune Magazine added “Dieselgate” to a long list of incidents that plagued VW and were symptoms of the VW culture. There, a VW whistle-blower described a culture of ruthless management in which engineers could not dare to admit defeat and, in his words, resorted to manipulation of the NOx emissions, as “an act of desperation” (Bovens, 2016b). From 1993 to November 2006, VW was run by Ferdinand Piëch. Piëch became an engineer and joined Porsche in 1963. He was the grandson of Ferdinand Porsche, who built cars for the Austro-Hungarian imperial family before World War I, long before Hitler asked him to build the VW, the People’s Car (Smith & Parloff, 2016). Piëch boasted of his willingness to threaten employees into giving him what he demanded (Smith & Parloff, 2016). It was this culture he passed on to the one who finally lived up to his expectations, the man who followed him as VW’s CEO, Martin Winterkorn, whom Piëch hired at Audi 25 years earlier (Smith & Parloff, 2016). Winterkorn carried on Piëch’s culture inside the company from 2006-2015, as he was working under the watchful eyes of Piëch, now chairman of VW (Smith & Parloff, 2016).

The Culture inside DWS

One of DWS's internal regulations mentioned that DWS's target was to achieve 26% of women in its management. Instead, in the USA or the UK, equal rights implementation policy required 50% of women representation. Moreover, being a single mother of 3 children was not considered an asset by her male colleagues inside DWS. Generally, the culture inside DB/DWS towards women was more to the side of misogyny (P. Business, 2023). Fixler, instead of the changes she asked for, was notified in writing that she was fired from the company, while CEO Asoka Woermann notified the press that Fixler was fired from DWS as inefficient in her work. According to Fixler, simultaneously DWS notified the Frankfurt immigration authorities that her work permit had expired, and she had to leave Germany immediately, since she was a citizen of the USA (P. Business, 2023; Webinar, 2022). DWS's European regulator, BaFin, only decided to investigate DWS after the issue became a hot topic in the international press. Generally, BaFin had close relations with DWS and avoided being as hard on them; instead, BaFin was hard on smaller companies or companies without DWS's influence (P. Business, 2023). The same happened with DWS's supervisory body, which decided to have an external investigator examine Fixler's allegations. The head of DB, Karl von Rohr, brought in PWC as an independent investigator. According to Fixler, PWC was already employed by DWS to examine ESG assets, having been brought in earlier by Fixler. It was a clear case of conflict of interest (P. Business, 2023). The result of the independent inquiry was that Fixler's allegations were unfounded, and Karl von Rohr closed the case(Sims & Orosz, 2023). When Fixler was asked to describe the culture inside DWS, she described it as a culture where the top management did not listen to or talk to its own managers. Instead, they behaved like "cowboys" (P. Business, 2023).

The Culture inside Shell

Shell, in its 2019 annual report, under the Section Culture (Plc, 2019), states that: "The Shell Commitment and Policy on Health, Safety, Security, Environment & Social Performance applies across Shell and is designed to help protect people and the environment". However, issues with Shell's exploitation of Nigeria's oil for decades (Adebayo, 2023; Laville, 2024), combined with the severe ecological pollution in the Niger Delta Ogoni land (Laville, 2024), show a culture of contempt and exploitation for the indigenous people and destruction of the environment. This divergence in Shell's culture between say-and-do is verified with Shell's misleading adverts in the media trying to persuade the public that the exploitation of tar sands in Canada (Stockman, Rowell, & Kretzmann, 2009) was sustainable (Hickman, 2008), or that the recycled carbon dioxide (CO_2) and waste sulphur were handled sustainably by Shell (Hough, 2007), leading to reprimands by the British authority ASA. This culture of non-compliance along with the deep-rooted corruption in Shell's practices, positions the staff, even up to the layer of upper management, as having minor influence in corporate direction(Stockman, Rowell, & Kretzmann, 2009). Several reports of whistle-blowers being fired and Shell getting lightly penalized have surfaced through the years(ZAM, 2020), indicating the role of staff is inconsequential in the overall structure of the firm, with Shell having much stronger political and judicial connections than independent whistle-blowers.

8.4. Research limitations and Future recommendations

The limitations will be analyzed in two sections. One for the three cases Accimap development method, and one for the Meta-Analysis. After each limitation, recommendations are given to supplement future research.

8.4.1. Limitations on the three cases analyzed

The limitations and recommendations of the present thesis first discuss the examined three major greenwashing incidents (VW emissions scandal, DWS's ESG misrepresentation, and the Shell v. Milieudefensie lawsuit). **While these cases provide valuable insights, they are specific to certain industries (automotive, finance, and energy) and geographic regions (primarily Western Europe and the USA), limiting the generalization of the findings.** To improve generalization, future research could expand the scope to include greenwashing cases from a wider variety of industries and regions, particularly in emerging markets where regulations are less stringent.

The analysis of the greenwashing incidents is limited to the specific timeline of the events leading up to and immediately following the greenwashing incidents. **This approach may overlook long-term trends and the evolving strategies of companies in response to these incidents.** A longitudinal study approach could be beneficial in understanding the long-term impact of greenwashing scandals and the effectiveness of subsequent regulatory changes.

The research focuses primarily on cases within developed countries, where regulatory frameworks are relatively robust. **This focus may overlook how different regulatory environments and cultural norms in other regions affect greenwashing.** Future research should include comparative studies across different regulatory and cultural contexts to explore how these factors influence greenwashing practices.

The case studies rely mainly on publicly available data, court documents, and secondary literature. **This dependency may result in a biased or incomplete picture of the events, as some critical details might not be fully captured or disclosed in the available sources.** Future studies should aim to include more diverse data sources, such as interviews with key stakeholders, internal company documents, and media analyses, to provide a more rounded perspective.

8.4.2. Limitations and recommendations on the Meta-Accimap created

This section discusses some limitations and recommendations with reference to the meta-Accimap.

It is worth mentioning that when the meta-Accimap was developed by P. M. Salmon et al. (2020), the last layer, "Equipment and surroundings," had 10 codes available for categorizing outcomes. These codes included:

1. Animal, plant & biological hazards;
2. Built environment & infrastructure;
3. Equipment, technology & resources;
4. Information & data;
5. Noise & visibility;
6. Other;
7. Physical & natural environment;
8. Time-related;
9. Weather & climate;
10. Work environment.

When deriving the meta-Accimap for the greenwashing incidents, the outcomes at the last layer were typically judicial decisions or forms of punishment, which could describe all the greenwashing outcomes. To account for this, the only solution was to use code "6. Other," and under this code include the meta-Accimap outcome. **However, this limits the necessary characterization of the outcome into several categories, as not all outcomes were uniform. This is a limitation in the use of the Accimap for cases that describe greenwashing outcomes.** Future work is necessary to introduce more codes at the final Accimap layer.

Other limitations in the use of a meta-Accimap for greenwashing include: - The synthesis of the Accimap results across the three cases may lead to overly generalized conclusions. **Given that the cases are all high-profile incidents in developed markets, the findings might not be applicable to smaller, less-publicized incidents or those in developing markets.** Future research should consider validating the meta-analysis findings with additional greenwashing cases from different industries and regions to ensure broader applicability. - P. M. Salmon et al. (2020) highlighted that many Accimap analyses tend to focus heavily on factors at the lower levels (e.g., physical processes, human errors) while underrepresenting higher-level systemic factors (e.g., regulatory bodies, government policies). Similarly, the present thesis identified key management and governance failures, but likely did not fully capture the broader systemic influences—such as international regulatory frameworks or global market pressures—that contribute to greenwashing. This limitation goes hand-in-hand with the expansion of the research to encompass more cases of greenwashing for a clearer understanding of the systemic influences.

Chapter 9
Critical Reflections & Conclusions

9.1. Critical Reflections

The research conducted in the present thesis created many considerations and contributed to the researcher's understanding of "greenwashing". The introduction of the dissertation set forth one major objective. This objective was coupled with two research questions that acted as a guide to the further analysis and the methods used.

1. ***Research Question:*** How can "Greenwashing" be conceptualized as a systemic failure within complex socio-technical systems?
2. *Subresearch Question:* What are the systemic influences across the cases?
3. *Objective:* To identify, and analyze the common systemic influences contributing to greenwashing from three high-profile incidents in various industries.

To address the main research question the researcher focused on analysing greenwashing through the lens of a sociotechnical system. The thesis focused on framing greenwashing as an interconnected systemic failure that stems from multiple failures in decisions and interactions of the several players in the system. It also focused on understanding the dynamic role of greenwashing by exploring the interactions between the layers of influence. To meet that end the Accimap methodology was selected as the best representation of a dynamic risk management tool. The decision to work with this method laid the groundwork for further conceptualizing greenwashing as a systemic failure through the synthesis of a Meta-Accimap that maps out the common systemic influences of greenwashing. The framing of greenwashing as an unwanted outcome (or accident) either deliberate or not, left room for looking at the incidents from an objective point of view, that doesn't allocate responsibility to specific players but rather shows the decision inflow and outflow as well as the ripple effects from layer to layer. This objective character contributed to conceptualizing greenwashing as a symptom of systemic malpractice in decision-making rather than an individual company act.

Another major aspect of the research question was selecting representative cases of greenwashing with an abundance of data, but also ones that were conclusive in having consequences from "greenwashing". This decision was a result of the need for a terminal point in analysing the systemic influences of an accident. The cases of VW, DWS and Shell all had an abundance of information and also fitted the description. Each case brought a different character of "greenwashing" to the tale as VW used technology to greenwash emissions, DWS used underhanded corporate tactics to silence whistleblowers and maintain a culture of fear and ignorance, and Shell colluded heavily to pursue its own interests while maintaining a facade of sustainability. Regardless of the methods, the cases all had major implications in framing greenwashing as a consequence of the system rather than companies' individual decisions.

Considering the sub-research question, the research focused on analysing empirically the major categories of influences. After the construction of the first three Accimaps these Empirical categories were created to supplement the Meta-Analysis. The nine categories of observed influences encompass the overall decisions that lead to greenwashing and showcase the case-specific factors that contributed to the "greenwashing".

Moreover, the objective of the thesis came to fruition through both the second research question but also the creation of the Meta-Accimap. As the research set out to identify the common factors and elevate the conversation from individual cases to overall "greenwashing conclusions, the allocation of the events was made to 27 codes. The expansion from the nine categories to these codes as well as the addition of the layers in the Meta-Accimap gave definitive influences that constitute greenwashing as a consequence. A major understanding came from the comparison to Salmon's Meta-Analysis. This showcased how greenwashing is predominantly a problem stemming from government, regulators and top management, as decisions in these levels mostly lead to greenwashing. One point that became of significant interest to the research was how the

governments aided the companies in facilitating greenwashing or mitigating the damages once discovered. In all three cases, the governments had a collusive relationship with the company. Be it VW with the German government's knowledge of the defeat device incident, The DWS's swift attempt to cover the incident with the help of DB & German governmental connections, or Shell's involvement with multiple world governments to facilitate interests, all had governmental aid to facilitate their actions. However further exploration on the subject is required through case studies as the inclusion of 3 in comparison to 23 of Salmon's is a major drawback for the generalizations of this research.

Finally in terms of the researcher's reflections, several learning points and an understanding of "greenwashing" were gained during the thesis. Primordially, the rigorousness of data analysis, codifiyin events and the overall Accimap methodology were acquired and internalized. The research had steps including data gathering analysis, explanations and Accimap creation as well as many more in the Meta-Analysis methodology. Throughout these past months an understanding of how specific this research can get, especially with the Social Networks Analysis and Centrality, to visualize greenwashing as a systemic failure. Since the task was completely new in framing greenwashing as an unwanted outcome or accident, the satisfaction of producing a method that combines the concepts became immeasurably rewarding. Still acknowledging the limitations and recognizing the inherent challenges of mapping and understanding an ever-evolving concept such as greenwashing, continuous effort is required to delve further into detail while encompassing more research. This dissertation marks a personal milestone as well, instead of only an academic one. It facilitated growth in adapting to new methods but also realised personal potential of delving into an unknown field. I would describe the journey, from inception to completion, as one marked by constant learning, adaptability, and discovery.

9.2. Conclusions

Considering the problem statement in the introduction of the thesis, it is clear that understanding the less explored socio-technical aspect of greenwashing presents a crucial point for minimizing the risks posed by greenwashing. Current research covered specific parts in classifications and manifestation but the overarching systemic character of the issue has been overlooked. Furthermore, A key concept that's pervasive throughout the thesis is the merging of greenwashing as a concept with the Accimap methodology. Since this kind of framework hasn't been addressed in the literature, the development of a robust and rigorous process to frame the concept as a systemic consequence posed a challenge. One of the first steps to taking the issue was to gather the relevant literature where Accimaps have strayed from the traditional "accidents" and focused on more conceptual topics. This differentiation led to an approach to frame greenwashing within such a system. The picking of the cases VW, DWS(DB) and Shell was also pivotal in showcasing how systemically embedded these companies were in creating a system that facilitated greenwashing.

In sight of addressing the literature gap, Chapter 2 outlines the methodology followed and the multiple studies used to address concerns and issues in the creative process. The method strayed from the conventional model of Rasmussen and implemented later research that encompassed the role of the key actors with a new layer naming scheme for greenwashing and integration of Bradford's methodology to greenwashing. The addition of a validation mechanism in ascertaining dataset completeness helped in mapping the sources and creating the datasets for the later Chapters 3-5. Finally the implementation of a synthesis framework in the greenwashing cases added to answering the primary research question.

Following the methodology the research attempted the creation of the first Accimap. Following the first part of the method described in chapter 2 the Accimap revealed several conclusions for the VW case, specifically pertaining to its lenient and to an extent collusive relations with the German government. Although there is no definitive evidence ascertaining the relation, the systemic decisions made point to the actuality of this assertion. Another major conclusion was the "point of birth" of greenwashing stemming from a need to increase the US market share. This strategic outlook facilitated a multi-year plan that superseded checks and balances, both internal and external, to research the testing gap and ultimately create the defeat device. Besides the code of conduct of VW prohibiting unethical tactics or corruption the device development and implementation with Bosch's involvement as well continued. This showcased that greenwashing was not a single decision or individual act, but a multi-year endeavour to cheat the system for profit. A major feature of the German lobby groups of VW is that they are embedded in the German government. While this realisation attunes these groups to the more traditional corruption tactics through a conflict of interest, a takeaway is that they knew of VW's plan to implement the device. This connection as well as accounting for the decisions made on a governmental level after the scheme was discovered, positions the layer as almost complicit in the proliferation of the deception. This realization coupled with the slow regulatory response in Germany, which still has not prosecuted former VW CEO Martin Wintercorn and continuously delays the process presents a major obstacle

to mitigating greenwashing. The position of the CEO when the scandal broke was that ”a few rogue engineers” were responsible. The case however could not be further from the truth as more and more company culture pressured engineers and operational management to engage in these practices. As was discussed in Chapter 8 the culture in VW perpetuated fear and obedience rather than transparency. To this day, no whistleblower has emerged outlining the internal meetings decisions and presentations done, but only anonymous sources.

In Chapter 4 the greenwashing case of a financial institution, created amongst legal turmoil for the parent company (DB), was explored. The Accimap in DWS's case was pivotal in understanding the case-specific influences that led to the ESG scandal. While Desiree Fixler was only six months into the company the realisation of major holes in ESG investment policy was made. The subsequent presentation she made to the board outlined the harsh reality of a company created out of the necessity for restructuring without a proper framework in place. She specifically addressed the dangers of maintaining window-dressed investments in oil & gas bundled in with green ventures and advertising them as sustainable. The Lack of internal oversight as well as the misrepresentations of the asset portfolios was the focus point in her presentation. Instead of correcting the course, DWS decided to fire Desiree Fixler while simultaneously contacting the media to address her incapability for the role. Another important observation in DWS was that the company culture endorsed and even applauded non-sustainable practices and reprimanded her when she called out the behaviour. This behaviour perpetuated greenwashing in the company, even as BaFin the German financial regulator began to probe DWS's asset handling. The contempt in which DWS later held Desiree Fixler in cannot be overstated as they swiftly removed her visa and deported her without notice of them doing so. DWS had a culture of completely ignoring ESG guidelines to maximize profit either from pressures or other needs for the parent company quotas, but the handling of Desiree shows an embedded culture of corruption and a complete deviation from ethical corporate practices. While in the US the SEC fined and installed a compliance monitor in DWS, the German regulators have still not taken action against DWS. The German government is also dragging its feet on the issue as endless investigations have hampered a verdict up to now. The involvement of the multiple layers of government regulators, staff, consumer groups and others showcase the systemic character of greenwashing in this case as well as the complete culture of contempt held against ESG regulations.

Next, Chapter 5 presented Millieudefensie's litigation against Shell. While the litigation focused on Shell's misrepresentation of emissions, it brought to light the several corporate malpractices Shell committed through the years, with some bordering on criminal offences. The judicial process incriminated Shell on using a relative mechanism for reporting sustainability and emissions while it found that multiple times it has engages in greenwashing including: selling phantom carbon credits for its Canadian oil fields, transforming Nigeria into a client state for oil extraction and completely polluting its natural wealth, while denying the consequences, divesting from major oil field operations without conducting rehabilitation efforts and claiming sustainable operations etc. This history of greenwashing and frankly destroying natural capital, was endorsed for years by several governments where Shell operated and used it ties to lobbying groups to achieve its interests. Another major reason for Shell being accused of greenwashing is the strategic decision in 2007 to divest from renewables and focus specifically on Oil & Gas exploration and extraction. This led the entire corporate machine to shift its lobbying interests, operations and management to facilitate oil and gas investments. The several organizations that Shell became a member of or created to enable interests are showcases to be major global players in continuous lobbying for the strategic goals set. The complicity of the staff and its own research and development teams in producing techno-economic reports that ignore climate action amplifies the problem and positions it as a systemic consequence of the decisions made at multiple levels and at multiple times. Shell was prosecuted to reduce emissions by 50% until 2030 but the contempt of the court decision and subsequent relocation to the UK situate the company for another greenwashing scandal. The deep-rooted corruption in Shell's example showcase not only the systemic character of Shell's greenwashing case but also the systematic efforts to thwart sustainable efforts and hinder the energy transition.

Finally, in Chapters 6,7 and 8 the synthesis and analysis of all three maps are created and ”greenwashing is finally conceptualized as a systemic symptom of broader decisions in the system. Several aspects are also thoroughly discussed that elevate the conversation from individual greenwashing incidents to more general systemic influences, that are prevalent throughout the three cases. It is found that the Management layer is mostly the source of systemic influences but also the ”Management: Policy & Procedures” is the most influenced node in the research. This concludes that while management decisions are indeed the ”point of conception” of greenwashing, it is influenced by the other several decisions and factors present in the other layers. The Meta-Accimap also showcased that ”Regulators and Judiciary: Audits & inspections” is the most influential node pertaining to the fact that stricter audits and inspections are needed that promote transparency and an ethical approach to combating greenwashing. The comparison to research by Salmon indicated that 80% of greenwashing contributory factors stem from the top four levels in contrast to 80% being at the bottom

two. The discussion also delves into the culture of the companies having a major impact on management decisions and is also directly connected to ”Organizations & Companies: Compliance with procedures, violations & unsafe acts” which showcases the impact of individual company cultures in the overall playing field for organizations. Finally, a reactive system that adjusts to greenwashing in accordance with the prosecution of one behaviour is bound to repeat itself. The thesis recommends several points of ”leverage” to be explored further and alleviate the systemic contributions that lead to greenwashing. Future research should focus on developing controls based on the findings of this and future relevant research. Recommendations included the creation of a proactive system for greenwashing that facilitates a clear understanding of the rules and corporate implementation, more frequent Audits from regulatory bodies and the creation of a separate climate regulatory body to alleviate the pressure from the judiciary system, internal management oversight for policies as well as the cultivation of a ”green” culture of transparency in practices and finally robust whistleblower laws that address the fallout in carrier development.

Recognizing the limitations of the research, we must finally address the research contributions of the thesis. This research has demonstrated that greenwashing is a much deeper issue, involving not only the people working within the firm but also many other actors related to the firm. These actors may include government officials, regulations and legislation, the activities of the larger organization under which the firm operates, its management, its staff, and all others connected to the firm’s operations. Only when all these actors and events are integrated and analyzed together can proper conclusions be drawn about the causes leading to greenwashing. All three cases analyzed in this thesis proved that greenwashing in each case was systemic, and the guilty party was not only the firm’s CEO or an individual decision but rather a complex symptom of decisions made on several layers of the socio-technical system. A systems approach was developed mixing Rasmussen’s framework with greenwashing and also implementing Salmon’s framework to make a more generalized conversation about greenwashing as a systemic failure. The systemic factors identified in this thesis provide a valuable tool for understanding and addressing the root causes of greenwashing. As businesses, governments, and consumers continue to prioritize sustainability, the conclusions of this research can help identify whether a firm’s environmental commitments are genuine. Future research should focus on expanding the current taxonomy and also develop controls to the systemic contributory factors analyzed here. As sustainability becomes all the more relevant in today’s society, this research will benefit sustainable development to forgo the pitfalls and understand the interplay of the factors that lead to greenwashing.

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Appendix A
The Accimap Synthesis Method and Relevant calculations

A.1. The Layers for implementing Salmon et. al methodology

Table A.1: Grouping of contributory factors into thematic codes for the three Accimaps

Categories				
OUTCOME	**Individual contributory factors**	**Number of contributory factors, by study**		
		VW	**DWS**	**SHELL**
6. Penalties/fines/outcomes of court decisions	Industry-wide loss of trust and estimated $12.6bn in Equity losses VW fined more than $32bn for violations and settlements, L6.6 VW engineer, James R. Liang jailed for 40 months, L6.5 Robert Bosch Co fined $327.5m, L6.4 Independent monitor to oversee VW group for 3 years, L6.3 VW's CEO Winterkorn charged and fined by US court, L6.2 Estimated 59 emission related deaths to VW, L6.1 DWS won a lawsuit by Fixler, L6.1 Independent monitor to oversee DWS for 1 more year, L6.2 Consumer group case resolved in out of court agreement, L6.3 DWS was fined in USA for ESG misstatements, L6.4 Shell lost credibility, L6.1 Shell obstructed the energy transition, L6.2 Court ordered Shell to reduce emissions, L6.3 Shell accused of violating human rights, L6.4	7	4	4
STAFF	**Individual contributory factors**	**VW**	**DWS**	**SHELL**
14. Communication & coordination	Fixler made a presentation to DWS, L5.2 CEO Woehrmann fired Fixler, L5.3 Shell Employees attended institutions' committees, L5.2	-	2	1

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Table A.1 – continued from previous page

15. Compliance with procedures, violations & unsafe acts	Fixler accused DWS for misrepresenting ESG portfolios, L5.5 VW executives and engineers try to cover up the illegal software, L5.3 VW employees destroy thousands of incriminating documents, L5.4	2	1	-
16. Delayed discovery & response	VW engineers realized cars could not meet US standards, L5.1 A VW employee warned top managers that US regulators may investigate VW, L5.2	2	-	-
17. Equipment, technology & environment	Shell Research Staff	-	-	1
20. Other-Judicial	Fixler filed an unfair dismissal case against DWS	-	1	-
21. Personnel management & workloads	Fixler joined DWS	-	1	-
	MANAGEMENT			
MANAGEMENT	**Individual contributory factors**	**VW**	**DWS**	**SHELL**
31. Compliance with procedures, violations & unsafe acts	VW executives decided to use illegal software in VW cars, L4.2 VW Operations and Engineering teams won prizes in USA for clean cars of the year, L4.4 Shell was reprimanded for misleading Ads, L4.7	2	-	1
32. Culture	DWS published its “Responsible Investing”, L4.3 DWS announced it will use AI, L4.5 DWS appointed Karl von Rohr to review Fixler’s allegations, L4.6 Shell followed climate change research since 1950, L4.1 Shell realized that it had to take preventive emission measures, L4.2	-	3	2
34. Financial Pressures	Shell continued operations in the Canadian tar sands, L4.6 Shell’s management reinvigorates operations in oil and gas, L4.9 Shell used relative CO2 calculation mechanism, L4.10 In 2009 VW started a “clean diesel” massive marketing push in the USA, L4.3 VW Expanded US Operations further, due to increased Market Share, L4.6	2	-	3
36. Other-Judicial	Karl von Rohr closed the case, L4.7 VW Management Replaced CEO Winterkorn after apology and resignation, L4.8 CEO Woehrmann under pressure after scandal broke, L4.8	1	2	-
37. Personnel management & recruitment	Woehrmann was appointed CEO of DWS, L4.4 DWS CEO Woehrmann announced he will step down, L4.10 Stefan Hoops replaced Woehrmann in DWS, L4.11	-	3	-

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Table A.1 – continued from previous page

38. Planning & preparation	VW began sales of cars at a new $1 bn factory in Chattanooga, Tenn.	1	-	-
39. Policy & procedures	VW management decided to increase its USA market share, L4.1 DWS is reinstated as a subsidiary to DB with full ownership, L4.1 DWS public after minority stake from DB, L4.2 Shell Top management lobbies for strategic goals, L4.4 Shell corporate strategy focus: Shale Extraction, L4.5 Shell's management refused to align with Paris emissions agreement, L4.11	1	2	3
41. Risk assessment & management	DB investigated CEO Woehrmann's private emails, L4.9 Shell reversed its emissions prevention policy after 2007, L4.3 Shell management didn't believe limit of 2° C is possible by 2050, L4.8	-	1	2
43. Supervision	VW group forced to admit use of cheating software, L4.7	1	-	-
ORGANIZATIONS & COMPANIES				
ORGANIZATIONS & COMPANIES	**Individual contributory factors**	**VW**	**DWS**	**SHELL**
45. Compliance with procedures, violations & unsafe acts	Robert Bosch Co was asked by VW to assist, L3.1 A team runs road tests on VW cars revealed excess NOx emissions, L3.2 German consumer group sued DWS, L3.2 Milieudefensie asked Shell to follow Paris climate decisions, L3.3 Shell collaborated with API for environmental research, L3.4	2	1	2
46. Culture	IPIECA was used as a mechanism to lobby with the Dutch government, L3.1 CONCAWIA & EUROPIA Lobbied to drop climate targets, L3.2	-	-	2
47. Financial Pressures	Global Trade Associations and Industry felt the ripple effects, L3.4 DB sold minority stake to DWS, L3.1 Trade Associations WSPA, NAM, API, CAPP, APPEA, L3.5	1	1	1
49. Other-Countries and consumers affected	US consumer groups with affected VW vehicles asked for compensations, L3.3 Member of Multiple Lobbying institutions Globally, L3.6	1	-	1
REGULATORS & JUDICIARY				
REGULATORS & JUDICIARY	**Individual contributory factors**	**VW**	**DWS**	**SHELL**

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Table A.1 – continued from previous page

57. Audits & inspections	EPA started an inquiry into VW's emissions, L2.1 EPA starts testing all VW, L2.2 DWS signed an agreement with the US Justice Dept., L2.1 US SEC investigated DWS over sustainability, L2.2 U.S. Justice Dept. extended stay of special monitor to DWS, L2.3 Legal Action of Milieudefensie against Shell, L2.1	2	3	1
59. Compliance with procedures, violations & unsafe acts	EPA issued a notice of violation to VW, L2.3 EPA issued a second notice of violation to VW, L2.4 Approx. 12 more Nations investigated the VW incident, L2.6 Switzerland banned sales of VW cars, L2.7 Australia launched stop-VW cars sale policy, L2.8 China announced recall of VW cars, L2.9 The Environment Minister of S. Korea fined VW, L2.10 VW Canada fined, L2.11 VW fined in the UK, L2.12	9	-	-
62. Judgement & decision-making	USA Courts decision for VW, L2.5 DWS German Courts, L2.5 DWS US court, L2.4 Nigerian Courts Summoned Shell, L2.2 Dutch Court Decision for Shell, L2.3	1	2	2
GOVERNMENT & AUTHORITIES				
GOVERNMENT & AUTHORITIES	**Individual contributory factors**	**VW**	**DWS**	**SHELL**
70. Action omitted and failure to act	Nigerian Government asks for cleanup efforts, L1.4 Dutch Government warned of lack on climate action (Shell), L1.7 Dutch Minister reporting on Climate Issues (Shell), L1.8	-	-	3
75. Policy, legislation & regulation	German Government alarmed about VW's defeat device impact on logo "made in Germany", L1.1 The EU said that U.S. had tougher emissions rules, L1.4 The EU pursued policy to reduce global T by less than 2°C, L1.1 Shell supports United Nations external voluntary codes, L1.5 Shell followed the Dutch Government's guidelines, L1.6	2	-	3
77. Priorities	German Government tried to help VW, L1.3 Canadian Government collaborations, L1.2 Close Collaboration of Shell and Dutch Government, L1.3	1	-	2

Continued on next page

Table A.1 – continued from previous page

79. Supervision & enforcement	Did German Government know about the VW scandal? L1.2 Frankfurt Police investigated threatening letters, L1.2 German Raided DWS premises, L1.5 German prosecutors investigated former DWS CEO Woehrmann, L1.4 Prosecutors raid DWS gathered ”factual evidence”, L1.3 Germany’s financial regulator BaFin Investigated DWS, L1.1	1	5	-
Total contributory factors		39	32	34

A.2. Thematic Code Arrangement

Table A.2: Arrangement of the thematic codes in the synthesized Accimap layers

Level	ID	Codes	Name of Code	Contributory factors	Layer %	Accimap%
1	Government, Authorities					
		70	Action omitted and failure to act	3	17,6	2,9
		75	Policy, legislation & regulation	5	29,4	4,8
		77	Priorities	3	17,6	2,9
		79	Supervision & enforcement	6	35,3	5,7
TOTAL,2				17	100,0	16,2
2	Regulators & Judiciary					
		57	Audits & inspections	6	30,0	5,7
		59	Compliance with procedures, violations & unsafe acts	9	45,0	8,6
		62	Judgement & decision-making	5	25,0	4,8
TOTAL, 2				20	100,0	19,0
3	Organizations & Companies					
		45	Compliance with procedures, violations & unsafe acts	5	41,7	4,8
		46	Culture	2	16,7	1,9
		47	Financial pressures	3	25,0	2,9
		49	Countries and consumers affected	2	16,7	1,9
TOTAL, 3				12	100,0	11,4
4	Management					
		31	Compliance with procedures, violations & unsafe acts	3	10,0	2,9
		32	Culture	5	16,7	4,8
		34	Financial pressures	5	16,7	4,8
		36	Judicial	3	10,0	2,9
		37	Personnel management & recruitment	3	10,0	2,9
		38	Planning and preparation	1	3,3	1,0
		39	Policy & procedures	6	20,0	5,7
		41	Risk assessment & management	3	10,0	2,9
		42	Supervision	1	3,3	1,0
TOTAL,4				30	100,0	28,6
5	Staff					

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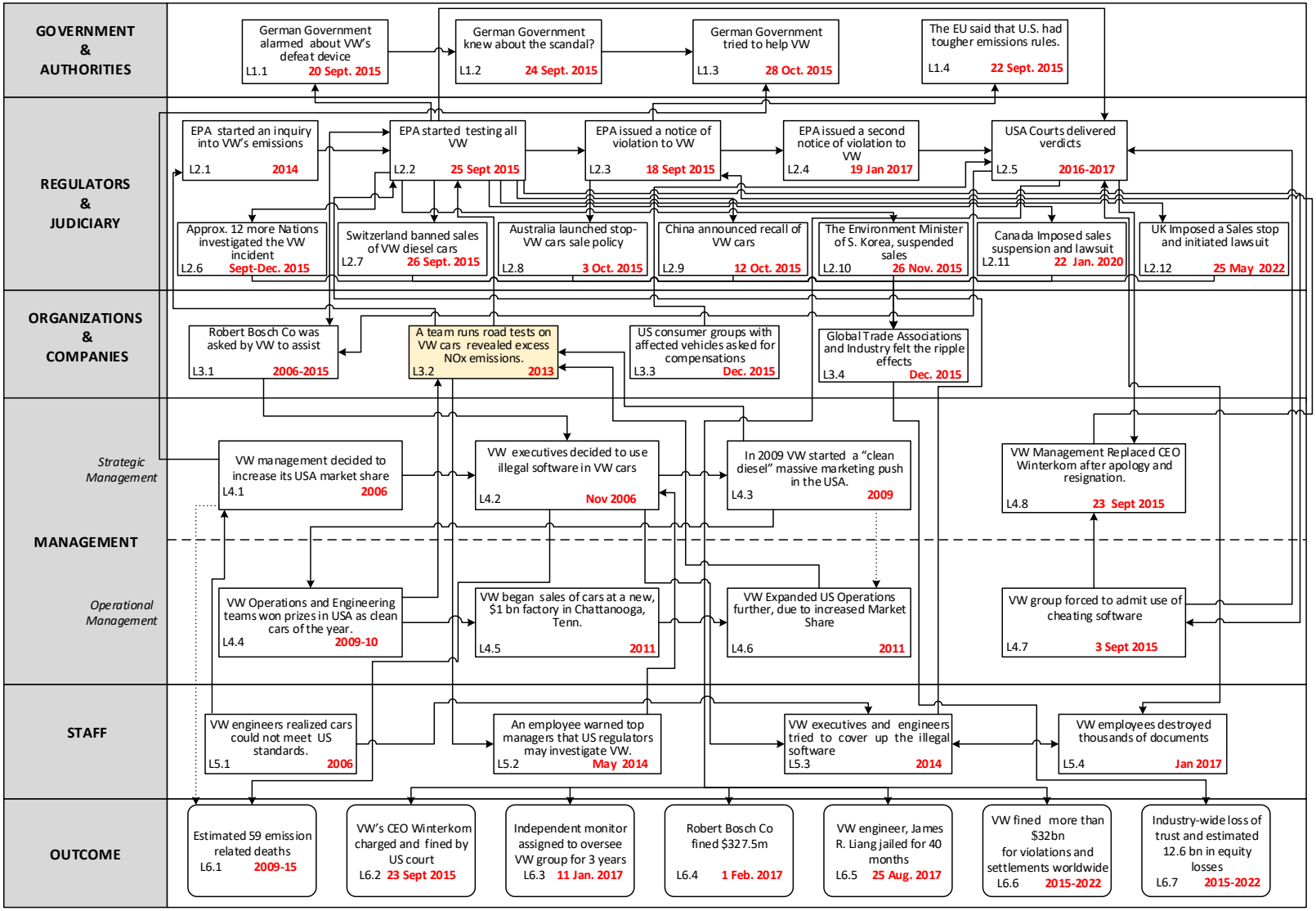
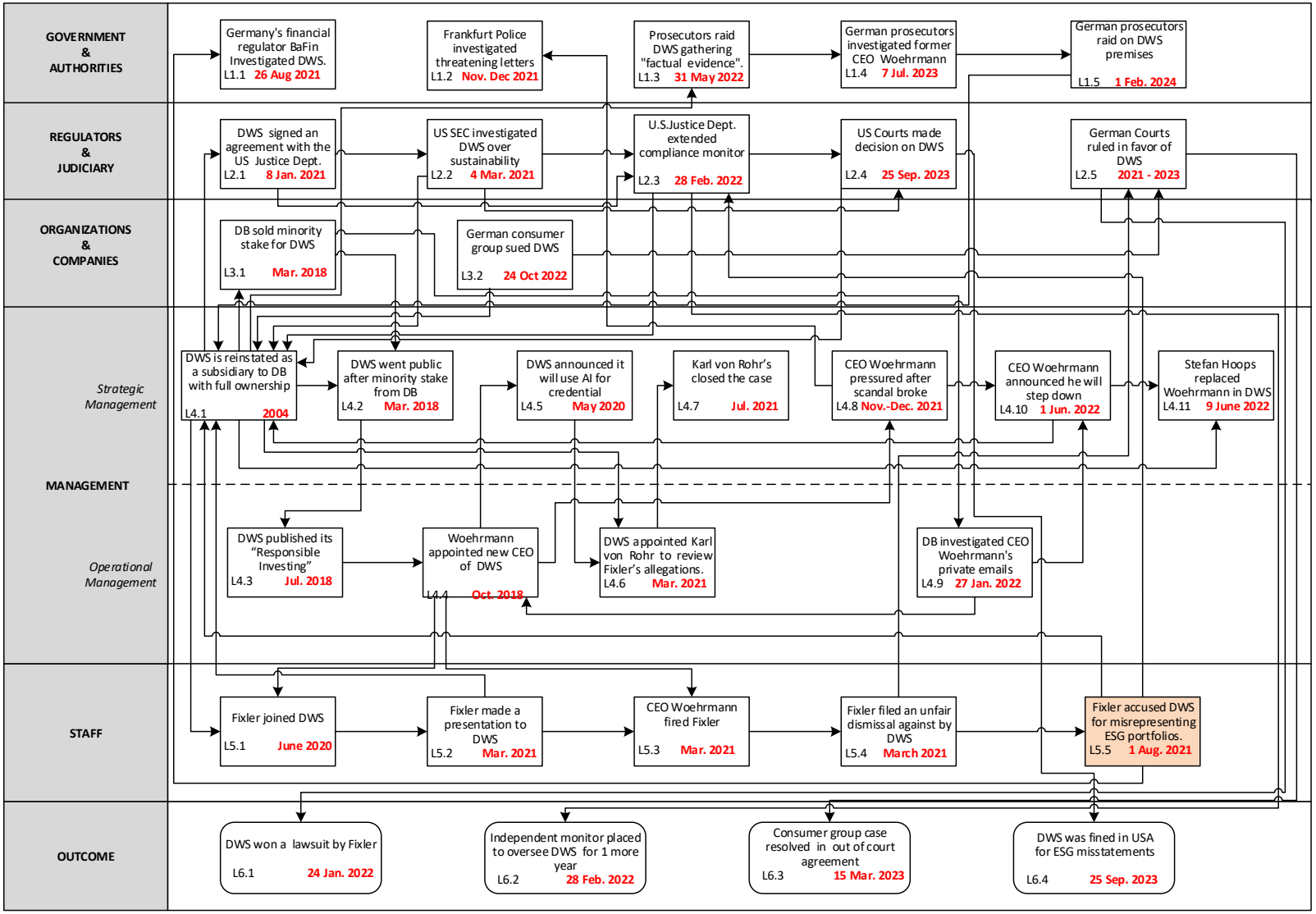
Table A.2 – continued from previous page

Level	ID	Codes	Name of Code	Contributory factors	Layer %	Accimap%
		14	Communication & coordination	3	27,3	2,9
		15	Compliance with procedures, violations & unsafe acts	3	27,3	2,9
		16	Delayed discovery & response	2	18,2	1,9
		17	Equipment, technology & environment	1	9,1	1,0
		20	Other-Judicial	1	9,1	1,0
		21	Personnel management & workloads	1	9,1	1,0
TOTAL, 5				11	100,0	10,5
6	Outcome					
		6	Penalties/fines /outcomes of court decisions	15	100,0	14,3
TOTAL, 6				15		14,3
Accimap Total		27		105		100,0

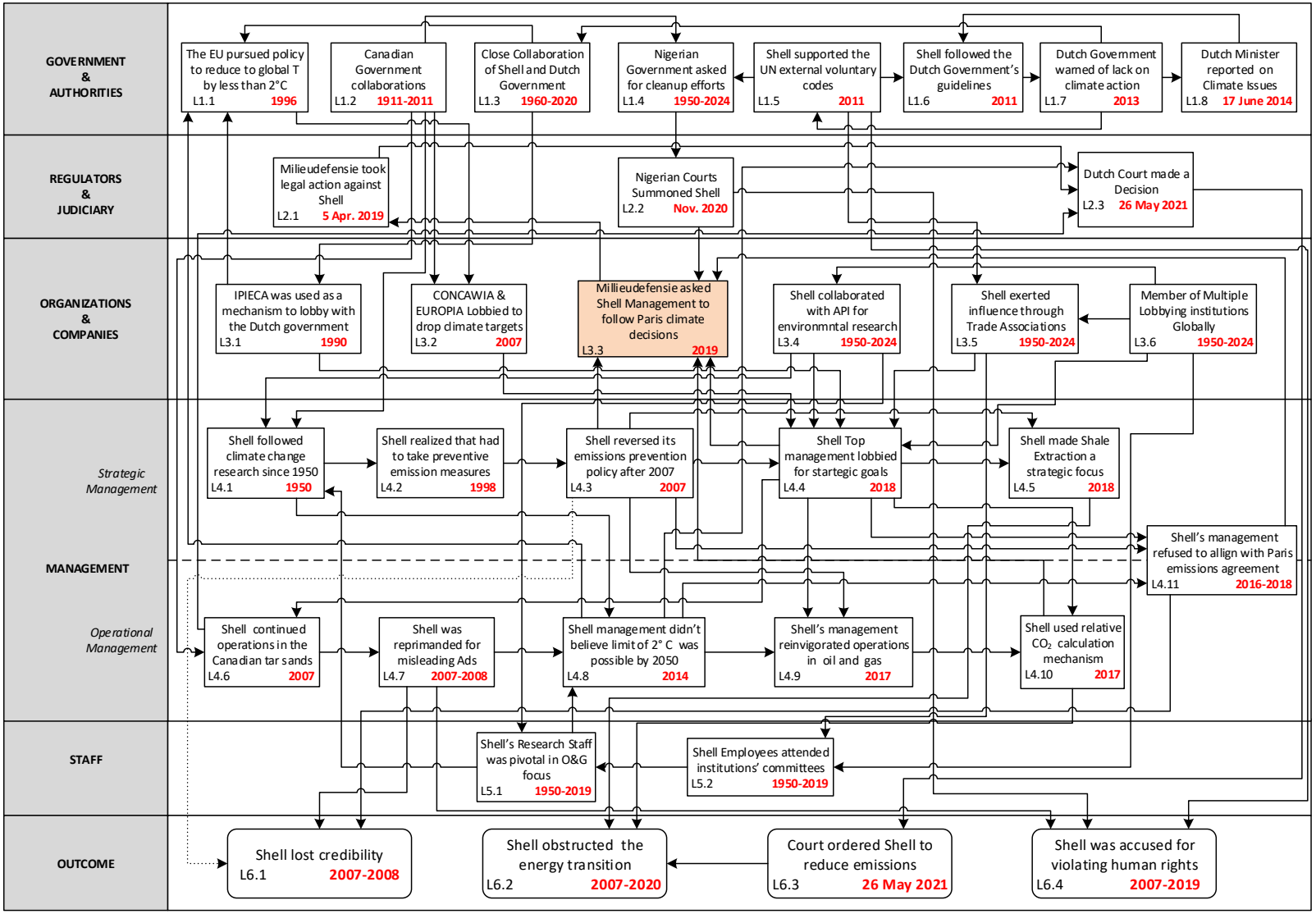
A.3. Enlarged Accimap For the VW Case



A.4. Enlarged Accimap For the DWS Case



A.5. Enlarged Accimap For Shell's Case



A.6. Enlarged Meta-Accimap