Strategic Responses to Critical Raw Material Dependency: A Study of DAX-Listed B2B Companies

Yannick Frahm

Dissertation written under the supervision of professor Gonçalo Leite

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Abstract

Title: Strategic Responses to Critical Raw Material Dependency: A Study of DAX-Listed B2B Companies

Author: Yannick Frahm

Keywords: *Critical Raw Materials, Supply Chain Risk, Strategic Management, DAX Companies, B2B, Sustainability Strategy, Supply Security, Geopolitical Risk, Corporate Strategy*

This study examines how DAX-listed business-to-business (B2B) companies strategically respond to the increasing dependency on critical raw materials (CRM). Global trends such as decarbonization, electrification, and digitalization have increased the importance of resources such as lithium and cobalt. These risks are further intensified by geopolitical concentration, ecological constraints, and evolving regulatory frameworks such as the European Critical Raw Materials Act (CRMA).

Despite facing similar external pressures, companies adopt heterogeneous strategic responses to manage CRM dependency. To explain this variation, the study applies a multi-theoretical framework combining Institutional Theory (IT), Resource Dependence Theory (RDT), and the Resource-Based View (RBV), extended by environmental perspectives, in particular the Natural Resource Dependence Theory (NRDT) and the Natural Resource-Based View (NRBV). This approach enables a multi-level analysis of how external pressures, resource dependencies, and company-specific capabilities together shape strategic decision-making.

Methodologically, the research applies a theory-driven comparative archival analysis of annual and sustainability reports from eight DAX-listed B2B companies over the period 2024 to 2025. A qualitative coding framework is used to evaluate relevant CRM-related disclosures.

The findings reveal a clear pattern of institutional isomorphism at the macro level, with companies demonstrating similar responses to regulatory and normative pressures. However, variation emerges at the meso and micro levels, where differences in dependency intensity, ecological exposure, and internal capabilities determine strategic choices. The study contributes to the literature by developing an integrated conceptual framework that explains strategic heterogeneity under shared institutional conditions.

Resumo

Título: Respostas Estratégicas à Dependência de Matérias-Primas Críticas: Um Estudo de Empresas B2B Listadas no DAX

Autor: Yannick Frahm

Palavras-chave: *matérias-primas críticas, risco da cadeia de suprimentos, gestão estratégica, empresas DAX, B2B, sustentabilidade, segurança de suprimento, risco geopolítico, estratégia corporativa*

Este estudo analisa como empresas business-to-business (B2B) listadas no DAX respondem estrategicamente à crescente dependência de matérias-primas críticas (CRM). Tendências globais como descarbonização, eletrificação e digitalização aumentaram a relevância de recursos como lítio e cobalto. Esses riscos são agravados pela concentração geopolítica, restrições ecológicas e novos marcos regulatórios, como o European Critical Raw Materials Act (CRMA).

Embora enfrentem pressões externas semelhantes, as empresas adotam respostas estratégicas distintas para gerir a dependência de CRM. Para explicar essa variação, o estudo utiliza um quadro multiteórico que combina a Teoria Institucional (IT), a Teoria da Dependência de Recursos (RDT) e a Visão Baseada em Recursos (RBV), complementadas por perspectivas ambientais, especialmente a Natural Resource Dependence Theory (NRDT) e a Natural Resource-Based View (NRBV). Essa abordagem permite analisar como pressões externas, dependências de recursos e capacidades internas influenciam a tomada de decisão estratégica.

Metodologicamente, a pesquisa aplica uma análise arquivística comparativa de relatórios anuais e de sustentabilidade de oito empresas B2B listadas no DAX entre 2024 e 2025. Os resultados revelam um padrão de isomorfismo institucional no nível macro, enquanto diferenças na intensidade da dependência, exposição ecológica e capacidades internas explicam variações estratégicas nos níveis meso e micro. O estudo contribui para a literatura ao desenvolver um quadro conceitual integrado para explicar a heterogeneidade estratégica sob condições institucionais compartilhadas.

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List of Abbreviations

B2B	Business-to-Business
B2C	Business-to-Consumer
CRM	Critical Raw Materials
CRMA	Critical Raw Materials Act
CSRD	Corporate Sustainability Reporting Directive
DAX	Deutscher Aktienindex (engl. German Stock Index)
ESRS	European Sustainability Reporting Standards
EU	European Union
GDP	Gross Domestic Product
GRI	Global Reporting Initiative
HGB	Handelsgesetzbuch (engl. German Commercial Code)
ICT	Information and Communications Technology
IFRS	International Financial Reporting Standards
IT	Institutional Theory
LkSG	Lieferkettensorgfaltspflichtengesetz (engl. The Act on Corporate Due Diligence Obligations in Supply Chains)
NRBV	Natural Resource-Based View
NRDT	Natural Resource Dependence Theory
RBV	Resource-Based View
RDT	Resource Dependence Theory
REE	Rare Earth Elements
RMI	Responsible Minerals Initiative
PV	Photovoltaic
R&D	Research and Development
SES	Socio-Ecological System
SRM	Strategic Raw Materials
TfS	Together for Sustainability
VRIN	Valuable, Rare, Inimitable, Non-substitutable

1. Introduction

1.1 Background

"Lithium and rare earths will soon be more important than oil and gas."

Ursula von der Leyen, President of the European Commission

State of the Union Address, European Parliament, 14 September 2022

The shift toward decarbonization, electrification, and digitalization is reshaping modern industries (Fouquet & Hippe, 2022). At the center of this transformation lies a growing dependence on critical raw materials (CRM). According to the European Commission (2023), CRM are characterized by their high economic importance, growing supply risks, and low substitutability. Materials such as lithium, cobalt, silicon, and nickel (see Appendix 1) are essential to Europe's green and digital transformation (Pommeret et al., 2022). Their unique chemical and physical properties make them difficult to replace and strategically important for companies and governments (Eikeng et al., 2024). Recent economic and political shocks have brought CRM supply security into focus, exposing the fragility of globally integrated supply chains (Financial Times, 2025). Ensuring CRM supply therefore requires strategies that balance resource security with long-term competitiveness (Hool et al., 2024).

As one of the world's leading industrial economies, Germany plays a central role in global CRM trade (Zhu et al., 2022), but remains highly import-dependent (Federal Ministry for Economic Affairs and Climate Action, 2025). The country sources about 75% of its lithium from Chile, 50% of its magnesium from China, and 63% of its niobium from Brazil (ifo Institut, 2022). To reduce this dependency, policy measures have been implemented at various levels. The European Union (EU) has introduced new policy frameworks, while Germany is expanding domestic investments and recycling initiatives (Bagge et al., 2025). Nevertheless, companies remain responsible for securing their own supply chains to ensure long-term competitiveness (BMWi, 2020).

This dependency especially affects German companies operating in resource-intensive sectors, such as business-to-business (B2B) companies (German Council of Economic Experts, 2023). Unlike business-to-consumer (B2C) companies, B2B operations target other businesses or institutions. Their customers purchase goods and services for productive rather than personal use (F. Webster & Wind, 1972). Substituting CRM in these areas is technically challenging and often requires the redesign of existing products or processes (Pavel et al., 2016). Consequently, raw material management has shifted from a procurement concern to the core of corporate strategy (Hool et al., 2024). This development is also visible in corporate reporting. "Raw

material" has become one of the most frequently mentioned terms in the sustainability reports of companies listed in the German Stock Index (DAX) (Contala et al., 2024).

1.2 Problem statement

DAX-listed B2B companies face growing exposure to CRM dependency. Geopolitical concentration, rising global demand, and expanding regulatory requirements intensify this vulnerability. Secure access to CRM is therefore necessary to be competitive in the long term. Despite facing similar structural vulnerabilities, companies pursue different strategic options. Some diversify suppliers, others invest in recycling, partnerships, or vertical integration.

This variation raises an important academic and managerial question. In the context of CRM, it remains unclear why companies facing comparable institutional and geopolitical pressures adopt different strategies. In addition, the topic has not yet been sufficiently examined through a multi-theoretical framework (Mouloudi & Samuel, 2022). Existing studies have mainly focused on the policy level (Hool et al., 2024; Otterbach & Fröhling, 2025), other regions and industries (Ghezzi et al., 2025), industry reports (McKinsey & Company, 2025), or qualitative case studies (Hool et al., 2022).

1.3 Scope and contribution

The unit of analysis in this study is the company. Eight DAX-listed B2B companies are examined over the period 2024 to 2025. To address the explanatory limitations of any single theory, a theory triangulation approach is applied (Jick, 1979). This study draws on five theoretical perspectives, organized into two areas. The first area consists of three established frameworks, namely the Institutional Theory (IT), Resource Dependence Theory (RDT), and Resource-Based View (RBV). These perspectives are extended through the inclusion of the Natural Resource Dependence Theory (NRDT) and Natural Resource-Based View (NRBV).

Building on this theoretical foundation, the study adopts a theory-driven comparative archival research design (Das et al., 2018). The analysis is based on qualitative coding of corporate documents following O'Brien et al. (2014), which are evaluated using the developed framework. The focus is on qualitative strategic factors disclosed in the reports rather than financial performance measures.

Academically, the study develops an integrated conceptual model that explains strategic heterogeneity in CRM responses among B2B companies operating under the same institutional conditions. NRDT and NRBV provide the theoretical bridge between ecological constraints and company-level strategy. From a managerial perspective, the findings offer German executives guidance and a deeper understanding of growing CRM regulatory demands and

dependency management.

1.4 Structure of the thesis

The thesis is organized into seven chapters. Following this introduction, Chapter 2 defines the research objectives and central research question that guide the study. Chapter 3 provides an overview of the European and German macroeconomic and regulatory context surrounding CRM dependency. The relevant theoretical perspectives are then presented in Chapter 4, leading to the development of a framework. Based on this framework, a full methodological account is provided in Chapter 5. In Chapter 6 the main findings are discussed, and the strategic responses of DAX-listed B2B companies are examined and interpreted. The thesis concludes with key insights, managerial implications, limitations, and directions for future research.

2. Objectives

2.1 General and specific objective

The study examines how DAX-listed B2B companies strategically respond to growing dependence on CRM and why comparable institutional pressures lead to heterogeneous strategic outcomes across companies. Two specific objectives guide the analysis. The first is to identify and categorize the CRM-related strategic responses disclosed by the eight sample companies, using the integrated theoretical framework as an analytical lens. The second is to explain the observed variation in these responses by examining how differences in resource dependency profiles and company-level capabilities shape strategic behavior under shared institutional pressure. Measuring actual operational behavior or establishing causal relationships falls outside the scope of this study. Rather, its contribution is analytical and interpretive.

2.2 Research question

Building on these objectives, the thesis addresses the following central research question:

Why do DAX-listed B2B companies adopt heterogeneous strategic responses to critical raw material dependency despite facing comparable institutional pressures, and how do resource dependency profiles and company-level capabilities jointly shape these responses?

2.3 Expected output

The expected output of this study is a comparative framework that links structural CRM dependency, company-specific capabilities, and strategic responses across the sample companies. The framework aims to explain why companies respond similarly at the macro level

and why their strategies diverge at the meso and micro levels. From a managerial perspective, the framework offers structured guidance on the trade-offs and complementarities between different response patterns. Therefore, the aim is to support more informed strategic CRM decision-making in B2B contexts.

3. Research Context

3.1 Macro-Context

Understanding the strategic importance of CRM requires considering the macroeconomic and geopolitical environment in which companies operate. Three structural forces currently influence the environment in which DAX-listed companies must position themselves. These include accelerating global demand, highly concentrated supply chains, and an evolving EU regulatory landscape.

3.1.1. Global demand for critical raw materials

Global raw material consumption is projected to rise from 89 billion tonnes in 2017 to approximately 167 billion tonnes by 2060 (OECD, 2019). The main drivers of this growth are population increases, digitalization, and the shift to low-carbon technologies (Fojtíková et al., 2025). Although the expansion of the service sector may partly reduce overall material consumption, advances in electronics, semiconductor manufacturing and automotive production are expected to increase CRM demand significantly (IEA, 2024). Within the EU, the transition toward decarbonization and digitalization reinforces this trend (Fouquet & Hippe, 2022). By 2050, demand for lithium in electric vehicle batteries and energy storage systems is expected to increase sixtyfold, while demand for rare earth elements (REE) used in digital technologies and wind turbines is expected to rise tenfold (European Commission, 2020). In this context, CRM are predicted to replace fossil fuels as the strategic resource of the modern economy (European Commission, 2023), a shift that Carrara et al. (2023) describe as a material transition. As demand grows while supply remains limited, risks for companies dependent on these inputs will intensify (IEA, 2021). CRM have therefore become strategically important (Kalaitzi, 2018) and are central to business continuity (Bergmann et al., 2015).

3.1.2. Geopolitical supply concentration

The extraction and processing of CRM is heavily concentrated in a small number of countries (OECD, 2025a, see Appendix 2). China dominates the supply chains, accounting for approximately 60% of global CRM production and 85% of processing capacity (Fojtíková et al., 2025; WEF, 2024), and continues to expand its influence over REE (Fan et al., 2023).

According to the European Central Bank (2025), 80% of European companies are directly dependent on Chinese rare earth extractions. Beyond China, other key suppliers include Russia and South Africa for platinum group metals, Brazil for niobium, Australia for lithium and the United States for beryllium and helium (European Commission, 2023).

A major issue is that many of these CRM-rich countries face unstable political conditions (Fojtíková et al., 2025). Historical evidence shows that several countries, including China, have restricted CRM exports to protect domestic supply or achieve fiscal objectives (Fojtíková et al., 2025). Such measures illustrate how rapidly supply dependencies can be instrumentalized by actors to put pressure on others (OECD, 2025b). This geographic concentration increases vulnerability to geopolitical disruptions, export restrictions, and trade conflicts (OECD, 2025b). Within the value chain, a differentiation must be made between extraction and processing (Espinoza, 2023). Extraction covers the mining of ores and concentrates, whereas processing includes separation, refining, and chemical and metallurgical transformation (Righetti & Rizos, 2023). Europe currently has limited domestic REE extraction (World Economic Forum, 2025) and recent policy debates have clarified that Europe's strategic vulnerability extends beyond mining. The deeper dependency comes from insufficient domestic capacity for processing and refining (Financial Times, 2022).

3.1.3. European regulatory response

In response to these supply risks, the EU has launched a series of policy initiatives aimed at reducing structural dependencies (European Commission, 2025). At the center of this effort is the European Critical Raw Materials Act (CRMA), which focuses on ensuring secure and sustainable access to CRM (European Parliament & Council, 2024). The CRMA identifies 34 CRM, of which 17 are designated as strategic raw materials (SRM). SRM are a prioritized subset of CRM for sectors such as aerospace, defense, digital and energy (European Parliament & Council, 2024). To reduce dependence on third-country suppliers, the regulation sets binding targets for 2030. These require that at least 10% of annual EU consumption of SRM must be extracted domestically, 40% processed within the EU and 25% sourced from recycling. Furthermore, no more than 65% of the consumption of any single SRM should come from one third country (European Parliament & Council, 2024). Beyond target-setting, the CRMA creates conditions for expanding domestic raw material projects by simplifying permitting procedures, improving financial accessibility or strengthening supply risk monitoring (Righetti & Rizos, 2023). These measures are closely linked to the broader European objective of achieving open strategic autonomy (Schulze, 2024). In the short term, domestic mining

contributions are expected to remain limited due to lengthy permitting procedures, low public acceptance, and investment barriers (Righetti & Rizos, 2023).

3.2 Industry and competitive structure in Germany

Germany's industrial landscape presents an important context for understanding CRM dependency at the company level. As a highly specialized, export-oriented economy built on advanced manufacturing and industrial technology, Germany is structurally more exposed to CRM supply risk than most comparable economies. Unlike resource-rich nations that can fall back on domestic extraction, Germany has almost no meaningful domestic production of the materials its industries depend upon. Understanding this environment is necessary to answer the research question.

3.2.1 CRM exposure in German industrial sectors

As the largest economy in the EU, accounting for approximately 20% of total EU economic output (eurostat, 2025), Germany is one of the world´s major consumers of mineral raw materials (Bagge et al., 2025). Its structural exposure is primarily driven by a highly industrialized and export-oriented economic model combined with very limited domestic raw material extraction (Schreiber et al., 2025). Germany therefore relies heavily on CRM imports (Köllner, 2025).

The scale of this exposure is notable. Studies by McKinsey & Company (2025) estimate that approximately one million jobs in Germany are directly linked to industries relying on REE, contributing around €150 billion annually to Germany´s gross domestic product (GDP). Through indirect economic spillovers, disruptions could threaten up to four million jobs and approximately 9% of Germany´s GDP. Disruptions in raw material supply would therefore have notable consequences for key industrial value chains.

While the primary responsibility for securing CRM supply lies with private companies (BMWi, 2010), public policy in Germany has increasingly provided complementary support. Relevant measures include the identification of potential extraction areas, the provision of geological information, and initiatives promoting resource efficiency and circular economy practices (Bagge et al., 2025). Many of these projects focus on lithium and copper, although most remain at an early stage of exploration (Bagge et al., 2025).

3.2.2 Role of DAX-listed B2B companies

The DAX is Germany´s leading stock market index, including the 40 largest and most liquid publicly listed companies on the Frankfurt Stock Exchange (Deutsche Börse Group, 2026). These companies represent some of the most economically important corporations in Germany

and are in central positions in global industrial value chains. A large share of DAX-listed companies operates primarily in B2B markets, including automotive manufacturing, chemicals, and industrial technology (Germann, 2023). These sectors form the core pillars of Germany's growth model. Their deep integration into global markets is reflected in the fact that only around 18% of revenues are generated domestically (Goldman Sachs, 2024).

The focus on B2B companies is especially relevant in the context of CRM, as these materials are embedded in intermediate goods and industrial production processes rather than final consumer products (Hool et al., 2022). B2B companies act as key intermediaries within supply chains, transforming raw materials into technologically sophisticated components and capital goods used by other companies (Hool et al., 2022). Their position within industrial value chains implies direct responsibility for sourcing, processing, and managing critical production inputs.

There are numerous examples within this context. Siemens Energy requires REE and other CRM to produce wind turbines, electric motors, and power plants (Siemens Energy AG, 2025). BASF, one of the world's largest chemical companies, relies on CRM as catalysts and starting materials in their production processes (BASF, 2024). Mercedes-Benz needs lithium, cobalt, and REE for its electric vehicles and battery systems (Mercedes-Benz Group, 2025).

4. Literature Review and Theoretical Framework

The literature review follows the structured approach developed by Webster & Watson (2002). Relevant literature was systematically identified beginning with leading journals and supplemented by backward and forward citation searches. The review is organized around three central theoretical perspectives and their natural environment extensions. This enables the synthesis of existing knowledge, the identification of theoretical tensions, and the development of an integrated model suited to the research context.

4.1 Core theoretical perspectives

4.1.1 Institutional Theory

The starting point for how DAX-listed companies respond to CRM dependency is not the supply chain itself but the environment in which strategic decisions are made. Under these circumstances IT offers foundational insights. Rather than viewing companies as purely efficiency-driven actors, IT argues that organizational strategy is shaped by regulatory, societal, and industry pressures (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). In the CRM context, a company's publicly stated approach to CRM cannot be interpreted solely as

a reflection of its operational priorities. It is also always a response to the institutional environment in which those disclosures are produced and evaluated (Oliver, 1991; Suchman, 1995).

The mechanism through which companies navigate this environment is the pursuit of legitimacy. This is necessary for companies to secure access to key resources, maintain stakeholder engagement, and ensure organizational survival (Oliver, 1991; Suchman, 1995). Companies may therefore adopt strategies not only for economic gains but also to align with regulatory expectations and societal norms (Clemens & Douglas, 2005).

This pursuit of legitimacy can result in isomorphic behavior, whereby companies within the same industries become increasingly similar over time (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Three mechanisms drive this convergence. Coercive pressures, such as the CRMA, enforce compliance with sustainability and transparency standards. Mimetic pressures arise under conditions of uncertainty, and lead companies to observe and imitate competitors. Normative pressures emerge through professional networks and industry standards (DiMaggio & Powell, 1983).

While these mechanisms explain why companies converge on similar strategies, they do not explain why companies within the same institutional field adopt different strategic choices (Goodstein, 1994; Oliver, 1991; Sherer & Lee, 2002). Oliver (1991) partially addresses this gap by arguing that companies are not passive recipients of institutional pressure. Companies can respond actively through acquiescence, compromise, avoidance, defiance, or manipulation, depending on their resources and interests (Oliver, 1991). In the CRM context, highly dependent companies may be more likely to acquiesce due to strong external pressures. On the other hand, more powerful companies may engage in manipulation, for example through lobbying or participation in standard-setting initiatives at the policy level.

Despite these extensions, IT carries important limitations for this study. The theory tends to overemphasize stability and isomorphism, underestimating the dynamic nature of CRM environments (Goodstein, 1994; Sherer & Lee, 2002) shaped by geopolitical tensions and rapid technological change. IT also offers limited insights into how internal capabilities influence strategic responses, thereby failing to account for heterogeneity at the company level (Oliver, 1991, 1997; Sherer & Lee, 2002).

4.1.2 Resource Dependence Theory and Natural Resource Dependence Theory

RDT (Drees & Heugens, 2013; Hillman et al., 2009; Pfeffer & Salancik, 1978) and its extension, NRDT (Bergmann et al., 2015; Tashman, 2020) provide a complementary lens to IT. A structured overview of the underlying literature is provided in Appendix 3. Both theories assume that companies depend on external actors and resources, which create uncertainty and power asymmetries that must be strategically managed.

At its core, RDT states that companies depend on critical resources controlled by external actors to survive and grow (Pfeffer & Salancik, 1978). This logic is directly applicable to the CRM context, where high geographic concentration and limited supplier availability create dependencies (Ghezzi et al., 2025). Power asymmetries arise as suppliers controlling scarce resources increase their influence (Pfeffer & Salancik, 1978), and companies respond by selecting strategies aimed at reducing external pressure (Bode et al., 2011; Pfeffer & Salancik, 1978). The responses include buffering strategies such as supplier diversification and increased safety stocks, as well as bridging strategies such as alliances, joint ventures, and long-term partnerships (Ghezzi et al., 2025). Meta-analytic evidence further suggests that companies may restore control over critical resources through internal measures such as insourcing (Drees & Heugens, 2013).

Although RDT explains how companies can manage these interorganizational relationships, it treats resources as given inputs and does not address the ecological dimensions of resource scarcity (López-Gamero et al., 2011). NRDT addresses this by incorporating a socio-ecological system (SES) perspective (McGinnis & Ostrom, 2014; Ostrom, 2009), considering environmental dynamics such as resource degradation, climate change, and geographic dispersion (Bergmann et al., 2015; Tashman, 2020). Under this framework, companies may pursue economizing, ecologizing or hybrid strategies (Tashman, 2020), depending on how they balance economic and environmental objectives (Ghezzi et al., 2025; Tashman, 2020).

Several limitations apply across both theories. The existing literature offers limited insight into how companies dynamically adapt their strategies over time (Drees & Heugens, 2013). In addition, there is a strong bias toward US-based studies, raising questions about generalizability to German industrial companies (Hillman et al., 2009). Most importantly, neither RDT nor NRDT adequately explain why companies adopt different strategic responses (Drees & Heugens, 2013; Hillman et al., 2009). These limitations indicate the need for a more multi-theoretical perspective, including the RBV (Hillman et al., 2009).

4.1.3 Resource-Based View and Natural Resource-Based View

While IT and RDT focus on external pressures and interorganizational dependencies, the RBV is necessary to answer why companies adopt different strategic responses (Barney, 1991; Hart, 1995). The RBV provides an internal perspective for this thesis by giving insights into company-specific resources and capabilities (Barney, 1991; Hart, 1995). A structured overview of the relevant literature can be found in Appendix 4.

The RBV argues that companies possess unique assets, capabilities and knowledge (Barney, 1991; Peteraf, 1993; Teece et al., 1997) that form the basis for long-term competitive advantage (Peteraf, 1993; Teece et al., 1997). Within CRM industries, access to CRM represents a strategically important physical resource (Barney, 1991; Wernerfelt, 1984). When such access is valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991), it can generate competitive advantage through cost efficiencies (Peteraf, 1993) or secure supply (Hart, 1995).

However, competitive advantage does not arise from resource possession alone (Russo & Fouts, 1997; Teece et al., 1997). Equally important is how companies can exploit these resources through complementary capabilities (Hart & Dowell, 2011; Teece et al., 1997). In the CRM context, relevant capabilities include supplier relationship management (Peteraf, 1993; Teece et al., 1997), material processing technologies (Hart, 1995; Russo & Fouts, 1997) and innovation in substitution and recycling (Hart, 1995). Past investments and strategic decisions also shape the current capability base, constraining or enabling future strategic choices (Barney, 1991; Teece et al., 1997).

The NRBV extends this logic by incorporating environmental constraints and resource scarcity (Hart, 1995; Hart & Dowell, 2011). It argues that sustainable competitive advantage must be grounded in capabilities that reduce environmental burdens, including pollution prevention, product responsibility, and clean technology development (Hart, 1995; Hart & Dowell, 2011). Companies that develop such capabilities are better positioned to reduce material intensity, substitute critical inputs, and adapt to long-term resource challenges (Hart, 1995).

Several limitations of the (N)RBV must nevertheless also be acknowledged. The RBV has been criticized for insufficiently incorporating external factors such as geopolitical risks and institutional pressures (Oliver, 1997; Wernerfelt, 1984). The theory also provides limited insight into how capabilities develop over time, often treating companies as black boxes (Teece et al., 1997). The NRBV, meanwhile, remains empirically underdeveloped, with limited longitudinal evidence linking environmental capabilities to supply security outcomes (Hart &

Dowell, 2011). These limitations reinforce the case for integrating the (N)RBV with IT and (N)RDT rather than applying it in isolation (Barney et al., 2001; Hart & Dowell, 2011).

4.2 Theoretical synthesis

The three perspectives cannot be combined without addressing the tensions between them. Most importantly, they rest on different assumptions about organizational behavior. Each carries limitations that the others partially address. The purpose of the theoretical synthesis is therefore not to add the perspectives together, but to demonstrate why their combination is theoretically justified.

The most fundamental tension lies between IT's prediction of isomorphic behaviors and the (N)RBV emphasis on company-level heterogeneity. Taken alone, IT implies that institutional pressures lead to similar strategies, leaving little room for variation. The (N)RBV addresses this by focusing on the company-level capabilities, which explain why companies make different strategic choices under similar pressures. Oliver (1997) captures this, by arguing that the RBV and IT must be combined to explain both the similarities and differences in organizational behavior.

A second tension concerns the treatment of the natural environment. Both IT and RDT position ecological dynamics as external constraints, either as regulatory requirements or as sources of supply insecurity. Neither approach treats ecological conditions as part of the strategic environment itself. This framing is inadequate in the CRM context, where resource scarcity, ecological degradation, and geographic concentration are not temporary disturbances but structural conditions. The NRDT and NRBV correct this by treating ecological dynamics as integral to the strategic problem itself. A framework based only on RDT would treat supplier diversification and vertical integration as sufficient responses. However, the natural extensions show that companies must also develop capabilities in substitution, recycling, and material efficiency to remain resilient as ecological constraints intensify.

RDT's contribution to the integrated framework is to provide a connecting mechanism between the macro level of institutional pressure and the micro level of company capabilities. Institutional pressures do not translate directly into strategic action. Their impact is mediated by the degree of resource dependency. A company with low CRM exposure experiences institutional pressure primarily as a reputational risk. On the other hand, a highly dependent company experiences the same pressure as an existential supply threat that requires immediate strategic response. RDT introduces power asymmetry and resource criticality as the intervening variables that explain this variation in impact. Within the integrated framework,

dependency thus determines the urgency and intensity of strategic response, while company capabilities as identified by the NRBV determine the form that response takes.

Differences in CRM strategies across DAX companies result from varying institutional pressures, dependency levels, and company capabilities. Any single-theory account would systematically omit one or more of these dimensions, leading to partial and misleading explanations. It is because the three perspectives are in tension that their integration is theoretically necessary.

4.3 Theoretical Framework

Figure 1 translates the synthesis developed in Section 4.2 into an analytical instrument for the empirical analysis. Rather than treating IT, (N)RDT, and (N)RBV as separate perspectives, the framework integrates them across three levels. The macro, meso and micro perspectives each capture a different dimension of corporate responses to CRM supply risks. Together, they provide the basis for the coding categories used in the annual report analysis.

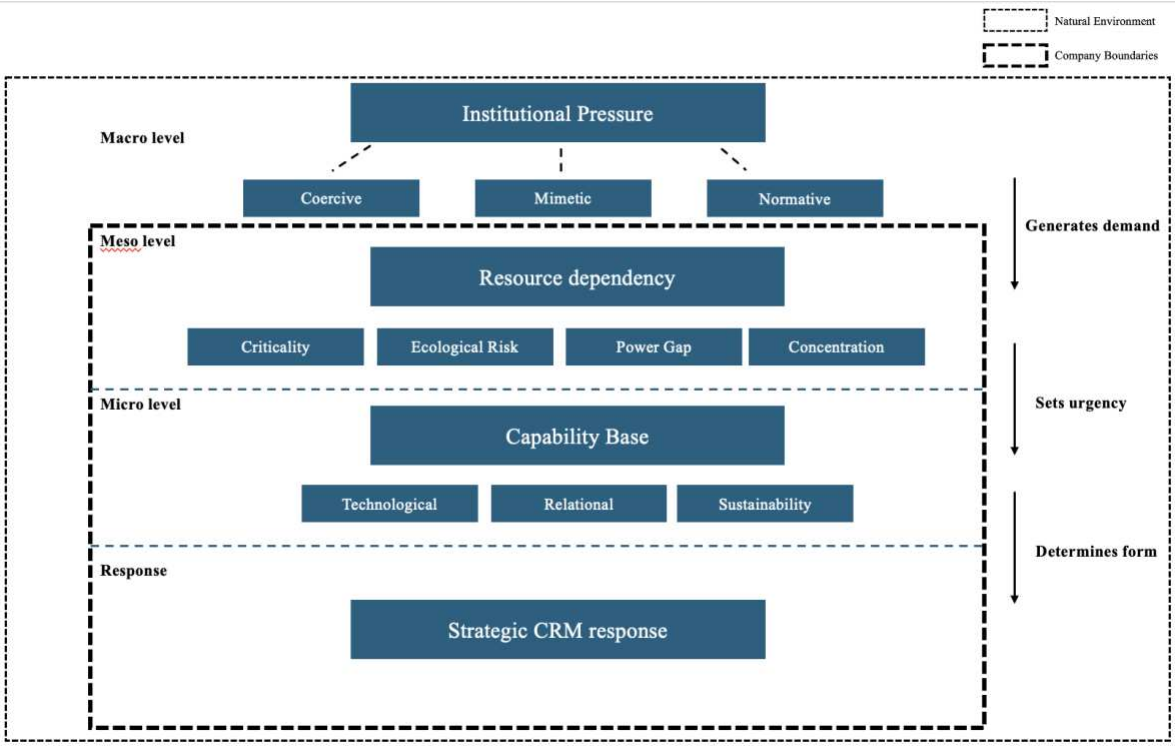


Figure 1: A Framework of Institutional Pressure, (Natural) Resource Dependence, and (Natural) Resource-Based View to Explain Strategic Responses to Critical Raw Material Dependency

The macro level is where institutional pressure arises. All sampled companies face coercive, mimetic, and normative pressure arising from regulation, industry norms, or stakeholder

expectations. However, institutional pressure alone cannot explain differences in corporate responses.

The meso level therefore explains how resource dependency transforms similar external pressure into different levels of strategic urgency. The meso level consists of four dimensions. *Criticality* refers to the economic and strategic importance of a given material to the company's production process. *Ecological risk* captures the extent to which supply is vulnerable to environmental degradation or climate-related disruption at the source. A *power gap* reflects the asymmetry between a company's bargaining position and that of its suppliers. When few alternative suppliers exist, supplier leverage increases and companies become more vulnerable to price volatility and supply disruptions. *Concentration* refers to the geographic and supplier concentration of sourcing. These four dimensions are analytically distinct but still interact with one another. A material can be ecologically at risk without being geographically concentrated or critically important without generating a power gap. At the same time, combinations of these dimensions can reinforce strategic vulnerability. For instance, sourcing a highly critical material from only a few suppliers can increase both dependency and disruption exposure. The meso level therefore captures different dependency profiles rather than fixed categories.

Knowing that a company faces intense institutional pressure and high dependency still does not explain how it will respond. Two companies with equivalent exposure may pursue different strategies because their capability bases differ. The micro level addresses this by examining what each company can do, independent of what the external environment demands. Three capability categories structure this assessment. *Technological capabilities* refer to process technologies, recycling infrastructure, and R&D investment that enable material efficiency improvements or substitution of critical inputs. *Relational capabilities* capture the quality and depth of supplier relationships. They reflect the company's ability to manage power asymmetries through partnership rather than market transactions. *Sustainability capabilities* include the processes for tracking, reporting, and reducing material intensity. These capabilities shape the strategic options available for the company.

The outcome level is where the three dimensions come together. Strategic CRM response is not treated as a categorical variable but as the observable outcome of the framework. Annual report disclosures provide the empirical basis through which these responses are analyzed.

The natural environment appears in Figure 1 not as a separate dimension but as the outer boundary of the entire framework. Ecological constraints influence all levels of the framework rather than appearing as a separate variable. They intensify coercive and normative pressure

at the macro level. They also increase ecological and supply concentration risks at the meso level. Finally, they increase the level of technological and sustainability capabilities required for long-term resilience. Treating the natural environment as an outer boundary reflects the core argument of both NRDT and the NRBV.

5. Methodology

5.1 Research design

This study adopts a theory-driven archival data analysis of annual and sustainability reports published by DAX-listed B2B companies. Archival data refers to information originally collected for purposes other than the present study, such as census data or corporate annual reports (Welch, 2000). Archival methods are well established in strategic management research (Das et al., 2018). Unlike interviews, archival sources reduce situational bias and rely less on retrospective recall (Welch, 2000). Their public availability and standardized formats support cross-company and longitudinal analysis, while supporting transparency and replicability (Das et al., 2018). The methodological design is deductive. A theoretical framework was developed prior to the analysis and then operationalized into a structured coding framework following O'Connor & Joffe (2020) (see Appendix 5). This coding framework converts the theoretical constructs developed in Chapter 4.3 into observable indicators in the annual reports and supports consistent comparison across companies (Bingham, 2023).

The analysis followed a systematic coding process. In a first step, the relevant reports were skimmed to ensure familiarity with the data and to identify relevant sections related to the research question. The following keywords were systematically searched for within the reports: "critical raw materials", "critical raw materials act", "raw material", "raw materials", "antimony", "arsenic", "baryte", "bauxite", "beryllium", "bismuth", "boron", "borate", "cobalt", "coking coal", "copper", "feldspar", "fluorspar", "gallium", "germanium", "hafnium", "helium", "heavy rare earth elements", "light rare earth elements", "lithium", "magnesium", "manganese", "natural graphite", "nickel", "niobium", "phosphate rock", "platinum group metals", "phosphorus", "scandium", "silicon metal", "strontium", "tantalum", "titanium metal", "tungsten", "vanadium". This familiarization phase helped develop an understanding of the content, context, and disclosure patterns within the dataset. Second, codes were derived from the theoretical framework and applied consistently to the reports. Each coded category was assigned an ordinal score from 0 to 2 to capture not only whether a theoretical perspective was present, but also the extent of its disclosure. This approach is consistent with Beattie et al. (2004), who identify this as an established practice in disclosure studies.

A score of 0 was assigned when a report contained neither a reference to the relevant category nor meaningful information that corresponded to the construct. A score of 1 indicated limited disclosure, where the issue was mentioned but lacked detailed or company-specific evidence. A score of 2 was given when the disclosure clearly reflected the theoretical category.

The maximum possible score of 20 results from the ten coding categories included in the framework. The thresholds distinguish between low, moderate, and high levels of CRM engagement without assigning different weights to individual categories. *Low engagement* (0-7 points) indicates primarily reactive behavior. *Moderate engagement* (8-13 points) reflects structured responses in some but not all dimensions. *High engagement* (14-20 points) represents integrated, multi-dimensional CRM strategies. These thresholds were chosen based on a simplified normal distribution-like structure of the scale. The division into three segments of similar size reflects the increasing levels of engagement while being consistent. This avoids weighting individual categories and supports a more systematic interpretation.

Given the length of corporate reports, recent research highlights the growing need for innovative approaches to support qualitative data analysis (Bazeley, 2013; Wen et al., 2025; Zhang et al., 2025). Claude was used to identify potentially relevant report sections using predefined coding categories. However, all coding decisions, score assignments, and interpretations were made independently by the researcher.

Reliability was supported through a predefined coding framework, explicit scoring rules, and consistent documentation. Although inter-rater reliability testing was not feasible due to the single-researcher design, repeated review of coded passages helped improve consistency. Validity was strengthened through alignment between the theoretical framework and coding categories.

5.2 Data sources

The data sources used in this study are corporate annual reports and sustainability reports published by DAX-listed companies in 2024 and 2025. In Germany, annual reports of DAX-listed companies are subject to audit requirements under German law. Independent auditors confirm the accuracy and completeness of the disclosed information (Quick et al., 2018). The information disclosed in reports is subject to strong incentives for accuracy, as companies face legal and reputational consequences for mispresenting their strategic positioning and risk exposure to the audience. This is especially the case for environmental practices (Andrus et al., 2023). Where annual and sustainability reporting was combined into a single document, this was treated as one source per company per year (see Appendix 6).

The observation period includes 2024-2025 and is grounded in a regulatory context. In 2024, the CRMA was introduced, establishing binding targets and marking an institutional shift in how CRM dependencies are addressed at the EU level. Reports from 2024 and 2025 therefore capture the first reporting cycles in which companies could be expected to respond to this new regulatory framework. This enables the analysis of disclosures under a comparable institutional environment. A two-year observation period was chosen to capture early developments while maintaining a manageable dataset. All documents were accessed through the company's official investor relations websites. No proprietary or subscription-based data sources were used, which supports the transparency and replicability of the study.

5.3 Data collection

The sample was determined by the DAX composition as of January 1, 2024. Companies that entered or exited the index after this date were excluded to ensure consistency across the full observation window. In the resulting pool of 40 companies, a three-stage screening process was applied to identify companies with CRM relevance across all three sectors.

Stage 1 excluded seven companies from the sector and technology assessment. These operate as pure financial or holding entities with no direct industrial operations, manufacturing processes, or supply chain activities and are therefore not relevant to the research question: Allianz (Insurance holding group), Commerzbank (Commercial bank), Deutsche Bank (Investment and commercial bank), Deutsche Börse (Stock exchange operator), Hannover Rück (Reinsurance holding), Münchener Rückversicherungs-Gesellschaft (Reinsurance holding) and Porsche Automobil Holding (Holding company). This process reduced the sample size to 33 companies.

A central methodological decision for this study concerns the scope of technologies and sectors, which was done in Stage 2. Prior studies (European Commission, 2020) and the CRMA (European Parliament & Council, 2024) identify three strategic sectors as most crucial for CRM dependency: renewable energy, e-mobility and defence and aerospace. These sectors were selected due to their expected growth, high CRM dependency, and strategic importance. Within each sector, relevant technologies were identified as these have the biggest projected increase in raw material consumption or serve as core components across multiple sectors simultaneously (European Commission, 2020). The technology scope per sector is defined as follows. Renewable Energy encompasses batteries, fuel cells, wind energy systems, photovoltaics (PV), robotics, 3D printing, and Information and Communication Technologies (ICT). E-Mobility incorporates batteries, fuel cells, traction motors, robotics, 3D printing, and

ICT. Defence and Aerospace considers batteries, fuel cells, PV, drones, robotics, 3D printing, and ICT. Table 1 summarizes the resulting technology-sector matrix.

	Renewable Energy	**E-Mobility**	**Defence & Aerospace**
Batteries	Yes	Yes	Yes
Drones	No	No	Yes
Fuel Cells	Yes	Yes	Yes
ICT	Yes	Yes	Yes
PV	Yes	No	Yes
Robotics	Yes	Yes	Yes
Traction Motors	No	Yes	No
Wind	Yes	No	No
3D Printing	Yes	Yes	Yes

Table 1: Technology-sector matrix for CRM dependency screening (own illustration based on a study developed by the European Commission (2020))

Each of the 33 remaining companies was then assessed against this matrix through desk research using publicly available sources, including company websites. A company qualifies for inclusion if it actively provides relevant materials for the technology to external customers or partners through developing, manufacturing, or supplying products or services. Companies that deploy the relevant technologies solely for their own internal operations were excluded.

Because all three sectors share overlapping upstream CRM supply chains, an isolated sectoral analysis would not accurately capture the current CRM dynamics. Analyzing only one or two of these sectors would require treating information from the excluded sector(s) as exogenous and uncontrolled variables. Analyzing all three sectors together allows a more comprehensive assessment of CRM-related supply risks and strategic responses. Therefore, two cumulative criteria determined the final inclusion in Stage 3. A company must demonstrate active provision of relevant materials or technologies in all three sectors simultaneously. Companies limited to a single technology across the full matrix were classified as negligible (Renewable Energy: Deutsche Telekom, SAP, E-Mobility: SAP, Defence & Aerospace: SAP). Given the previously described logic, relevance confined to one technology does not capture the interdependence between all sectors. These criteria led to a final sample of eight companies. The full screening documentation is provided in Appendix 7.

The eight companies that met all inclusion criteria are Airbus (Aerospace & Defence), BASF (Chemicals), Henkel (Specialty Chemicals & Adhesives), Infineon Technologies (Semiconductors), Merck (Life Science & Specialty Chemicals), Rheinmetall (Defence),

Siemens (Industrial Automation & Infrastructure), and Siemens Energy (Energy Technology). All eight operate exclusively or primarily in B2B markets, supplying industrial components, chemical inputs, semiconductor solutions, to other businesses and institutional customers rather than end consumers. Although Henkel operates as an important B2C business, Henkel's industrial adhesives and specialty chemicals division is the relevant unit that meets the B2B criterion in this study (Henkel AG & Co. KGaA, 2025).

Due to space constraints, only a representative excerpt of the coding table is presented in Appendix 9 (illustrated here using Airbus, 2024). It should be noted that individual passages from a given report may be assigned to more than one coding category. The complete dataset for all companies (Appendices 10-17) and reporting years is available as a supplementary file upon request.

5.4 Methodological limitations

Several limitations of this research design should be acknowledged. First, archival data reflects publicly disclosed information rather than internal strategic decision-making. As a result, the findings capture reported strategic behavior and may not fully represent underlying operational practices. Differences in disclosure quality across companies may also influence coding outcomes.

Second, the study relies on annual and sustainability reports. While these sources provide standardized and comparable disclosures, the inclusion of additional sources such as industry databases or interviews could have strengthened the analysis.

Third, the coding process was conducted by a single researcher, which limits the possibility of inter-coder reliability testing. To support consistency, a structured coding framework with predefined categories and scoring rules was applied throughout the analysis.

Another limitation concerns the sampling approach. Because the sample was fixed based on the DAX composition as of January 1, 2024, companies entering the index afterward were not considered. In addition, the three-stage screening process required interpretive judgment in a small number of cases where company disclosure was ambiguous. To maintain consistency, the same selection criteria were applied across all companies.

An exception to the two-year observation window must be made for Airbus. At the time of submission, the company had not yet published its 2025 annual or sustainability report. No data could be included for Airbus in 2025.

Finally, AI-assisted document processing was used to support the identification of potentially relevant report sections (Jalali & Akhavan, 2024; Wachinger et al., 2025). To address this, the

AI tool was strictly used complementary. Full transparency about the workflow is provided in Appendix 8 to enable critical assessment of the analytical process.

6. Discussion

This chapter presents and interprets the findings from the coding analysis of annual and sustainability reports published by eight DAX-listed B2B companies between 2024 and 2025. The discussion is structured along the macro, meso and micro levels of the integrated framework developed in Chapter 4 and addresses both dimensions of the research question.

6.1 Key findings

Table 2 presents the total scores across the two reporting years. Scores range from 0 to 20 and are grouped into three engagement levels defined in Chapter 5.

Company	2024 Score	2025 Score
Airbus SE	18 (High)	n.a.
BASF SE	17 (High)	17 (High)
Henkel AG & Co. KGaA	13 (Moderate)	14 (High)
Infineon Technologies AG	18 (High)	18 (High)
Merck KGaA	18 (High)	16 (High)
Rheinmetall AG	13 (Moderate)	15 (High)
Siemens AG	16 (High)	17 (High)
Siemens Energy AG	16 (High)	18 (High)

Table 2: CRM Coding Score Overview for 2024 and 2025

The coding results show relatively little variation in overall engagement levels. All companies score between 13 and 18 points, and most were classified as highly engaged. This pattern is notable given the structural differences between industries such as aerospace, chemicals, semiconductors, defense, and energy technology.

At the company level, Infineon Technologies achieved the highest and most consistent score, reaching 18 points in both years. This reflects the semiconductor industry's strong dependence on CRM and the need for comprehensive supply security strategies. BASF and Merck also show high engagement, with scores between 16 and 18 across both years.

A notable development can be observed for Siemens Energy, which improved its score from 16 in 2024 to 18 in 2025. This change shows that Siemens Energy is providing more detailed information in regard to CRM, especially about how much it relies on certain suppliers and the differences in power, rather than just reporting more information overall.

In contrast, Merck's score declined from 18 to 16 due to weaker disclosure in the categories of supply concentration and relational capabilities, despite continued high engagement overall.

The lowest scores in 2024 were observed for Henkel and Rheinmetall, both scoring 13 and therefore falling into the moderate engagement category. However, both companies improved in 2025, with Henkel reaching 14 points and Rheinmetall rising to 15 points. These findings are consistent with growing regulatory pressure during the first full reporting cycle under the CRMA. Henkel's moderate baseline scores should not be interpreted as a disclosure failure. Rather, it reflects the company's structurally lower dependency on CRMA-designated raw materials compared with companies embedded in semiconductor, aerospace, or energy technology value chains (European Parliament & Council, 2024). A closer examination of the category-level results in Table 3 reveals two main patterns.

First, variation is limited at the macro level. All companies achieved the maximum score in the coercive and normative pressure categories. In the mimetic category, all companies scored 1 except Siemens, which scored 2 points in both years. This suggests that institutional pressure has been widely internalized across the sample and has contributed to similar disclosure behavior.

Second, clearer differences emerge at the meso and micro levels. Variation is particularly visible in the categories of power gap, ecological risk, technological capabilities, and supply concentration. These dimensions capture differences in CRM exposure and in the capabilities that companies use to manage supply risks. The integrated framework is especially useful at this level because it helps explain why companies respond differently despite operating under similar institutional conditions.

	Coercive	Mimetic	Normative	Mat. Criticality	Ecological Risk	Supply Conce.	Power Gap	Tech Cap.	Relational Cap.	Sust Cap.
Airbus 24	2	1	2	2	2	2	1	2	2	2
BASF 24	2	1	2	2	2	1	1	2	2	2
BASF 25	2	1	2	2	2	1	1	2	2	2
Henkel 24	2	1	2	1	1	0	1	1	2	2
Henkel 25	2	1	2	1	1	0	1	2	2	2
Infineon 24	2	1	2	2	1	2	2	2	2	2
Infineon 25	2	1	2	2	2	1	2	2	2	2
Merck 24	2	1	2	2	2	2	1	2	2	2
Merck 25	2	1	2	2	2	1	1	2	1	2
Rheinmetall 24	2	1	2	1	1	1	1	1	1	2
Rheinmetall 25	2	1	2	2	1	2	1	1	1	2
Siemens 24	2	2	2	1	1	1	1	2	2	2
Siemens 25	2	2	2	2	1	1	1	2	2	2
Siemens Energy 24	2	1	2	2	1	1	1	2	2	2
Siemens Energy 25	2	1	2	2	1	2	2	2	2	2

Table 3: CRM Coding Results Across Macro, Meso, and Micro Levels

In summary, the findings show convergence at the aggregate level, while meaningful differences become visible at the meso and micro levels. These differences are interpreted in the following section.

6.2 Theoretical Interpretation

6.2.1 Institutional Pressure Responses on the Macro Level

At the macro level, the findings are very similar across all eight companies. Coercive, mimetic, and normative pressures have led companies to adopt comparable CRM-related governance vocabularies and disclosure practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977).

Response to Coercive Pressure

All companies reference regulatory frameworks such as the CRMA (Airbus SE, 2024, p.168) , the EU Conflict Minerals Regulation (BASF SE, 2025, p.217), and the German Supply Chain Due Diligence Act (LkSG) (Siemens Energy AG, 2024, p.39) in their reporting. Airbus illustrates coercive pressure particularly clearly by linking its CRM strategy directly to the evolving regulatory environment. The company documents an internal methodology for assessing material criticality covering supply risk, environmental impact and human rights (Airbus SE, 2024, p.168). BASF similarly positions regulatory compliance as an important condition for supply chain management. Supplier noncompliance with regulatory requirements can lead to supplier exclusion or a reduced supplier base (BASF SE, 2024, p.100). Similar patterns appear across the sample. Companies use comparable terminology, refer to the same regulatory frameworks, and describe similar governance measures. This supports the idea of institutional isomorphism, where companies operating under the same institutional pressures increasingly adopt comparable reporting practices.

Response to Mimetic Pressure

Response to mimetic pressure is the weakest of the three institutional mechanisms in this sample. The dominant form of mimetic alignment is not direct imitation of competitors, but participation in cross-industry standard bodies and benchmarking initiatives. Most companies refer to frameworks such as the Responsible Minerals Initiative (RMI) (Henkel AG & Co. KGaA, 2024b, p.213), the Global Reporting Initiative (GRI) (Siemens AG, 2024, p.3), or the Together for Sustainability (TfS) (BASF SE, 2024, p.225) initiative. This indicates convergence through professional networks rather than direct competitive imitation in the sense originally described by DiMaggio & Powell (1983).

The boundary between mimetic and normative pressure is therefore less distinct in practice than the theoretical framework suggests. Separating both mechanisms in the data requires in some cases interpretive judgment.

Siemens is the only company to score 2 on mimetic pressure in both years. Its disclosure moves beyond standard industry participation:

> *"We use the Conflict Minerals Reporting Template (CMRT) published by the RMI to survey our roughly 2,200 relevant suppliers and elicit the information we need about smelters in our supply chain that are associated with the production of tin, tantalum, tungsten, and gold (3TG). We share our findings on identified smelters with our RMI partners. The initiative then reviews the smelters' certification. In this process, Siemens supports the smelters as they move* toward the final audit and certification stage." (Siemens AG, 2024, p.59)

The difference between Siemens and the rest of the sample can partly be explained by sector characteristics. Siemens operates across several industrial fields, including automation, infrastructure and digitalization. This creates greater exposure to peer comparison signals than is the case for more specialized companies. Companies such as Infineon Technologies in semiconductors or Rheinmetall in defense operate in more specific institutional fields, where direct competitor benchmarking is less visible in public reporting. This does not mean mimetic pressure is absent. Rather, it suggests that, e.g. the CRMA itself may reduce the need for peer imitation. As regulatory expectations increase, uncertainty decreases, and the need for companies to imitate competitors is reduced.

Response to Normative Pressure

Every company in the sample achieved the maximum score on normative pressure in both reporting years. Read uncritically, this could suggest that all eight companies have embedded CRM governance within robust normative frameworks. A closer reading, however, shows that this dimension primarily captures participation in standard bodies and references to certification. These are visible and reputationally valuable activities to maintain external legitimacy, but they do not necessarily prove operational depth (Meyer & Rowan, 1977).

Henkel's normative score of 2 in both years shows this dynamic:

> *"Our customers expect their suppliers – and that includes Henkel – to ensure compliance with global environmental, safety, and social standards. Our standards and management systems, our many years of experience in sustainability reporting, and our leading positions awarded by external rating agencies all help us to convince our audience of our credentials in this domain." (Henkel AG & Co.KGaA, 2024, p.165)*

This passage is analytically relevant because Henkel links normative compliance to audience persuasion. Henkel's focus on external ratings and reporting supports Suchman (1995) findings

that companies pursue legitimacy by aligning disclosures with socially accepted governance expectations.

6.2.2 Resource Dependence as Strategic Driver

The central argument of this study is that resource dependency changes how strongly companies react to institutional pressure. Although all companies face similar regulatory requirements, their dependence on CRM differs. Therefore, the level of strategic urgency also differs.

Material Criticality

The contrast between Infineon Technologies and Henkel exemplifies this difference. Both companies face similar regulatory environments and both score 2 points on responses on coercive and normative pressure. Yet their meso-level profiles diverge substantially.

Infineon Technology provides a highly detailed description of its material dependencies.

> *"Access to high quality raw materials such as silicon and special chemicals is a critical input for semiconductor wavers"* (Infineon Technologies AG, 2025, p.10)

Silicon, silicon carbide, and gallium nitride are not generic inputs. They are technically central to semiconductor production, and shortages could directly affect wafer manufacturing. Infineon Technologies product strategy is built around these materials:

> *"Infineon's product strategy is focused on power semiconductors using silicon carbide (SiC) and gallium nitride (GaN), enabling energy-efficient solutions primarily for electric mobility, solar and wind energy, charging infrastructure, high-voltage direct current transmission, artificial intelligence (AI), and industrial applications." (Infineon Technologies AG, 2025, p.34)*

Henkel's situation is different. The company is exposed to raw materials that arise through broader value chains including polymers, surfactants, and adhesives. These materials are not classified as CRMA strategic materials and can usually be substituted more easily. Henkel's most specific disclosure concerns circularity and the recovery of valuable materials:

> *"We also ensure that valuable resources are kept in the economic cycle. For example, our debonding solutions make it possible to repair, reuse and recycle products and product parts, and to separate materials that are not suitable for collective recycling. This enables the reuse of precious materials, like rare earths in a cell phone or battery cells."(Henkel AG, 2025, p.169)*

Henkel's moderate score therefore reflects lower dependency intensity rather than weak strategic intent. This is one key insight of the meso level. Dependency severity determines how urgent CRM management becomes.

Ecological Risk

Beyond material criticality, ecological constraints emerge as second source of differentiation. NRDT argues that ecological dynamics such as resource depletion, climate-induced supply disruption and geographic concentration of extraction are structural features of dependency. These cannot be treated as external shocks which can be managed reactively (Bergmann et al., 2015; Tashman, 2020).

The data confirm this across several companies with Merck providing the most theoretically explicit illustration:

> *"We use critical raw materials and minerals extracted for the manufacture of various products. Most of these raw materials are sourced from China; most of them are also processed there. Due to growing demand and ongoing environmental degradation, a shortage of these materials could pose a significant risk to manufacturers in our upstream supply chain and to our own operations. This is applicable to our Electronics business." (Merck KGaA, 2024, p.196)*

Merck does not frame the risk as purely geopolitical or commercial. Instead, it links scarcity to environmental degradation and rising demand. This is consistent with the NRDT argument that ecological degradation can intensify resource dependency. When the ecological base itself is under pressure, conventional buffering strategies such as supplier diversification may be insufficient. Companies must also develop capabilities that reduce their reliance on degrading resources.

BASF makes a similar argument in relation to lithium sourcing in Salar de Atacama:

> *"This region is home to the world's largest lithium brine reserves and a significant share of global production. With this in mind, the Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation, GIZ) was commissioned with organizing a local multistakeholder platform, also comprising Indigenous communities, on the water-related opportunities and risks of lithium and copper extraction and other commercial activities as well as with driving forward action plans." (BASF SE, 2024, p.313)*

BASF incorporates hydrological stress at extraction sites into its supply security planning. This indicates a strategic approach that goes beyond market-based risk management and includes ecological-systemic reasoning.

Power Gap

A further distinction emerges in relation to geopolitical power asymmetries. The power gap dimension shows that dependency is not static. It can shift quickly when geopolitical events alter market structures.

Rheinmetall's 2025 disclosure states this dynamic with unusual directness:

> *"On October 9, 2025, China drastically expanded its export restrictions on rare earths, introduced additional controls and announced further regulations to be complied with by*

foreign manufacturers exploiting these materials. Rare earths and battery materials are especially in demand in industries such as automotive manufacturing, defence, aerospace, AI chips and data centres. Over 90% of the rare earth magnets processed in Europe come from China. China also stated that licences will not be granted to foreign defence users, whilst applications relating to advanced semiconductors will be reviewed on a case-by-case basis." (Rheinmetall AG, 2025, p.28)

The analytical significance of the passage lies not just in its content but in its placement. Rheinmetall chooses to open its regulatory environment section with this disclosure, signaling a shift in strategic framing. Rare earth dependency is no longer treated as a background procurement risk but as a named strategic constraint.

Supply Concentration

Supply concentration scores reveal a consistent pattern across the sample. Companies with direct exposure to constrained materials tend to disclose supply concentration risks more explicitly, while companies with indirect exposure score lower. Henkel is the only company to score 0 on supply concentration in both years, which reflects its limited direct exposure to geographically concentrated CRMA materials.

Infineon Technologies disclosure, by contrast, is clear:

"Infineon has all the important success factors for the silicon carbide business. A globally diversified supplier network secures our supply of the best-quality raw material at competitive prices."(Infineon Technologies AG, 2024, p.8)

Siemens Energy also demonstrates strong awareness of concentration risks and links its response to both diversification and substitution:

"In addition to consistently developing sustainable and diversified supply chains outside China, we continue to work on reducing our demand for rare earths through innovative material composition."(Siemens Energy, 2025, p.17)

This passage is theoretically important because it shows that diversification alone may not be sufficient when geographic concentration is structural. Long-term supply security may also require reducing material demand itself.

6.2.3 Internal Capabilities and Strategic Adaptation

Companies with comparable exposure may pursue different strategies because their capability bases differ. The micro level therefore examines what each company can do. The NRBV provides the appropriate lens for this analysis.

Technological Capabilities

Technological capabilities in the sample cluster around three response models: substitution-led, circularity-led, and system-level approaches.

The first model is substitution-led and is best represented by Infineon Technologies. The company is systematically expanding its focus on silicon carbide and gallium nitride in its semiconductor portfolio. This substitution is not primarily ecologically motivated. It is also driven by the superior performance characteristics of compound semiconductors in decarbonization applications. At the same time, it creates new technological assets and reduces dependency on conventional silicon-based supply chains:

"In autumn 2024, we were the first company worldwide to announce the rollout of 300-millimeter in-house manufacturing of GaN-based semiconductors. In the future, we can save investment costs by converting the required proportion of our available 300-millimeter silicon capacity, thus ensuring our technological leadership in all the main classes of power semiconductors."(Infineon Technologies AG, 2025, p.31)

The second model is circularity-led, best represented by Airbus and BASF. Airbus created a titanium revert loop in 2024 through a partnership with Aubert & Duval:

"Airbus works with a lifecycle perspective to improve circularity and reduce waste. In 2024, Airbus created a titanium revert loop, which recycles titanium scraps and chips generated by production activities at Airbus' plants. Through a partnership with Aubert & Duval, these materials can be recycled and reinjected into the aerospace supply chain, and ultimately be allocated to Airbus programmes. The use of secondary materials in the titanium production process can reduce energy needs by up to 90% compared to processing virgin titanium. Over 400 tonnes of titanium waste was able to be recycled using this process in 2024."(Airbus SE, 2024, p.14)

BASF follows a similar model across several material streams, including precious metals, lithium, cobalt and manganese:

"Another focus is on the recycling of mineral raw materials. For example, our Battery Materials division is advancing innovative technologies and solutions for recovering metals such as lithium, nickel, cobalt and manganese from end-of-life lithium-ion batteries or production scrap" (BASF SE, 2025, p.239).

The third model is system-level, represented by Siemens Energy and Merck. In this model, companies use data-driven tools to identify material and environmental risks during product development rather than only during procurement. Merck's GreenSpeed tool illustrates this approach:

"We want to make research and production as environmentally friendly as possible and have therefore developed our innovative GreenSpeed tool. This innovative tool allows us to automatically evaluate the sustainability of our chemical products during manufacturing, facilitating efficient and eco-friendly production methods. It tracks crucial metrics such as water usage, solvent consumption, energy expenditure, and greenhouse gas emissions, with the greenhouse gas emissions estimate derived from process mass intensity (PMI), or the total resources utilized to produce one kilogram of the final product."(Merck KGaA, 2024, p.200)

These three technological models have different implications for supply security. Substitution-led approaches can reduce material dependency but require high research and development (R&D) investments and long development cycles. Circularity-led approaches reduce demand for primary materials but depend on reverse logistics and partner ecosystems. System-level approaches enable earlier identification of material risks but require advanced data integration capabilities.

Relational Capabilities

Relational capabilities also show some of the clearest variation in the sample. BASF demonstrates a developed multi-stakeholder governance architecture, integrating supply chain decarbonization, ecological monitoring, and upstream partnerships:

> *"Our engagement in multistakeholder and other initiatives represents a key component of our strategic approach in relation to affected communities and all human resources in the value chain. BASF engages in networks such as Cobalt for Development, the Roundtable on Sustainable Palm Oil, the Global Battery Alliance and the Responsible Lithium Partnership, which is scheduled to run until 2025."(BASF SE, 2024, p.310)*

Siemens Energy has also developed a governance leadership position at the industry level. The company chairs the governance board of the European Partnership for Responsible Minerals and participates in the RMI:

> *"In addition to our RMI membership and strategic collaboration with the European Partnership for Responsible Minerals, where we chair the governance board, we are involved in Copper Mark, an assurance framework promoting the responsible production of copper."* (Siemens Energy, 2024, p.55).

This type of relational capability provides access to industry intelligence, smelter verification data, and emerging standards. It also enables companies to influence governance structures rather than merely comply with them.

By contrast, Rheinmetall's relational capabilities remain more reactive and internally focused. Its disclosure emphasizes supplier code of conduct enforcement and procurement council coordination. Rheinmetall's 2025 relational score of 1 reflects this limitation. The company manages existing supplier relationships but shows less evidence of building new upstream capabilities in the CRM context.

The difference between BASF and Rheinmetall is therefore not only a matter of scale. It also reflects strategic intent. BASF treats upstream relationships as a source of intelligence and resilience, whereas Rheinmetall treats them more strongly as a compliance management issue.

Sustainability Capabilities

Sustainability capabilities show patterns that differ. The data reveals a continuum between companies that embed sustainability tracking into operational decision-making and companies for which sustainability remains more disclosure-oriented.

Infineon Technologies conflict minerals due diligence program illustrates the operational end of this continuum:

> *"In addition to our existing focus on conflict minerals, cobalt, and mica under our conflict minerals program, we began broadening our scope in the 2025 fiscal year to include other high risk raw materials such as copper. In the 2026 fiscal year, we plan to extend the existing program covering conflict minerals, cobalt, and mica to create a raw materials program."(Infineon Technologies AG, 2025, p.83)*

Siemens Energy's Carbon Reduction@Suppliers Program represents another comprehensive supplier-facing approach:

> *"Through our Carbon Reduction@Suppliers Program, we engage over 3,400 suppliers—representing more than 75% of our supply chain carbon footprint—in a structured due diligence process to assess and support their carbon reduction efforts."(Siemens Energy, 2025a, p.71).*

By contrast, Rheinmetall's sustainability capabilities appear more reporting heavy and operationally thinner. The company discloses ISO 14001 extensions, ESG supplier risk scoring, and EcoVadis integration, but its CRM-specific operational content remains less developed than that of companies embedded in semiconductor, aerospace, or energy technology value chains. This gap is partly explained by the characteristics of the defense sector, where supply chain switching costs are extraordinarily high and sourcing transparency is shaped by regulatory and security constraints.

6.3 Cross-Case Findings

Building on the three-level analysis, five cross-case findings emerge. These findings improve the integrated theoretical framework and show how the three levels interact.

Finding 1: The Ceiling Effect as a Validity Signal

The aggregate ceiling effect, with all companies scoring between 13 and 18 on a 20-point scale, is not only a measurement limitation. It is also a substantive finding about institutional isomorphism under the CRMA. The regulatory framework has created a disclosure floor that even the least CRM-exposed company in the sample, Henkel, consistently meets. This supports the coercive mechanism of institutional theory and suggests that the CRMA has contributed to the restructuring of corporate reporting norms around CRM-related governance.

At the same time, the ceiling effect creates a validity limitation. The 20-point scale does not fully distinguish between companies with genuine strategic depth and companies with strong disclosure quality. This distinction is important for assessing long-term competitiveness.

Finding 2: The Defence Sector

Rheinmetall is one of the most analytically interesting cases in the sample because its strategic response profile changed qualitatively between 2024 and 2025. In 2024, the company primarily engaged in procedural CRM risk management, which includes cost escalation clauses, commodity hedging, and supplier code of conduct enforcement. In 2025, following China's October export restriction on REE, Rheinmetall's disclosure shifted toward a more strategically urgent framing:

> *"Supply bottlenecks or sharp price fluctuations for raw materials, such as rare earths, pose significant risks that are actively managed by the purchasing organisation. Price risks for raw materials, particularly aluminium, copper and nickel, are countered with cost escalation clauses in contracts on the sales side. When procuring raw materials that are traded on the stock market, the central Commodities Office manages the timing of purchases and the volume purchased in consultation with the operating units, making use of financial hedging instruments."(Rheinmetall AG, 2025, p.75)*

This shift from procedural management to named strategic constraint demonstrates the transition from a compliance-driven response to a dependency-urgency-driven response. The trigger was not the CRMA alone, but a geopolitical event that made an abstract supply risk operationally relevant.

This finding also reveals a sector-specific constraint. Rheinmetall's' relational and technological capabilities score remains comparatively underdeveloped relative to its dependency exposure. This gap can be explained by the structural characteristics of the defense sector, including single-source procurement structures, high requalification costs, and export control regimes that limit supply chain transparency. The defense sector, therefore, represents a case where IT and RDT predict strong pressure, but the (N)RBV capability base is constrained by non-economic factors.

Finding 3: Governance Leadership as a Relational Capability

A further finding is that some companies build relational capabilities not only through bilateral supplier partnerships, but also through leadership in multi-stakeholder governance bodies. Siemens Energy's chairmanship of the European Partnership for Responsible Minerals governance board, and BASF's co-founding role in the Global Battery Alliance represent a form of relational capability that goes beyond conventional supplier relationships.

Governance leadership creates several advantages, including earlier access to supply-chain intelligence, influence over standard-setting processes, and greater attractiveness as a partner for upstream co-investment. This is a form of institutional manipulation that Oliver (1991) identifies. Third, it positions companies as attractive partners for co-investment and joint development in upstream supply chains.

This evidence indicates that the relational capabilities dimension of the (N)RBV should be extended to include governance participation as an important capability.

Finding 4: The Corporate Sustainability Reporting Directive (CSRD) as an Intensifying Mechanism

An unexpected finding is the degree to which the CSRD appears to have strengthened CRM-related disclosure between 2024 and 2025. Several companies including Airbus (Airbus SE, 2024, p.123) , Henkel (Henkel AG & Co. KGaA, 2024b, p.4), and Siemens Energy (Siemens Energy AG, 2025, p.47) explicitly refer to CSRD compliance as a driver of enhanced sustainability reporting:

> *"This year's Sustainability Report marks the next step for this continuous process because it applies the requirements of the European Union's new Corporate Sustainability Reporting Directive (CSRD and its European Sustainability Reporting Standards (ESRS). The ESRS aim to improve the availability, quality and comparability of sustainability information that companies publish."(Henkel AG & Co. KGaA, 2024b, p.4)*

The CSRD's double materiality assessment framework requires companies to disclose both how sustainability issues affect the company and how the company affects the environment. This creates an incentive to expand CRM-related disclosures even where the CRMA itself does not prescribe detailed reporting. In particular ESRS E5 on resource use and circular economy appears to provide an important vocabulary for CRM management (Airbus SE, 2024).

This finding suggests that the CRMA and CSRD function as complementary coercive mechanisms. Together, they create a disclosure environment that is more demanding than either regulation alone and may accelerate the development of CRM-specific governance capabilities.

Finding 5: Disclosure-Based Strategic Positioning Profiles for long-term supply security

Bringing together the meso-level dependency profile and the micro-level capability base creates four strategic positioning profiles based on disclosure.

The first profile, **Dependency-Matched Responders**, includes BASF, Airbus, and Siemens Energy. These companies have developed capability bases that are proportionate to their dependency exposure. They have operationally integrated their technological and relational capabilities, making them upstream-oriented and ecologically informed. Their long-term supply

security position appears strong, although they remain exposed to geopolitical shocks that exceed the capacity of any single company to manage.

Infineon Technologies and Merck best represent the second profile, **Technology-Led Responders**. These companies rely strongly on technological capabilities, including substitution, efficiency, and internal process innovation. Their supply security positioning is strong where proprietary technological responses are available but may be weaker for materials where internal substitution or efficiency gains are not yet feasible.

The third profile, **Governance-Compliant Responders**, includes Siemens and Henkel in certain dimensions. These companies show strong institutional alignment and compliance. Their CRM-specific operational capabilities are less differentiated. Their long-term supply security therefore depends more strongly on market conditions and external supplier structures.

The fourth profile, **Urgency-Triggered Responders**, describes Rheinmetall's 2025 position. Rheinmetall has shifted from governance compliance toward strategic urgency, but its capability base, particularly in relational and technological dimensions, has not yet caught up with its exposure profile. This creates a capability gap that is consistent with (N)RBV, namely that past investment decisions constrain current strategic options.

6.4 Synthesis: Answering the Research Question

The analysis provides a three-part answer to the research question. First, companies respond to the same institutional pressures with similar governance vocabularies. This confirms the relevance of coercive isomorphism and shows that the CRMA, supported by related regulatory frameworks, has shaped disclosure practices across the sample within two reporting cycles.

Second, companies diverge because their dependency profiles differ. Material criticality, ecological risk, supply concentration, and power asymmetry vary across industries and create different levels of strategic urgency. Airbus, Infineon Technologies and Siemens Energy face more direct material constraints, while Henkel’s exposure is more indirect and therefore less strategically urgent. Rheinmetall represents a case in which geopolitical developments have intensified dependency concerns within a short period.

Third, companies with similar dependency exposure still pursue different strategies because their capabilities differ. Companies that have invested over multi-year horizons in closed-loop recycling technologies, multi-stakeholder upstream governance, and formalized material tracking systems are structurally better positioned to absorb supply disruptions than companies whose capability base is oriented primarily toward compliance and reporting.

Taken together, the findings provide empirical qualitative support for the integrated framework developed in this study.

7. Conclusion, Recommendations, and Limitations

7.1 Conclusion

The growing dependency of companies on CRM represents one of the most important challenges of the current decade. For DAX-listed companies, which occupy central positions in global industrial value chains while operating with almost no domestic raw material extraction, this challenge is particularly important. This thesis developed a multi-theoretical framework to explain why comparable institutional pressure produce heterogenous responses across companies. By combining IT, RDT, and the RBV with their environmental extensions the study developed an analytical instrument capable of capturing strategic behavior across the different levels. The empirical analysis confirmed that the framework provides explanatory power that the theoretical perspectives on their own could not achieve.

7.2 Managerial Recommendations

The findings carry three practical implications for executives managing CRM dependency in German industrial companies.

First, regulatory compliance and strategic resilience are not substitutes. The high scores on coercive pressure response indicate that DAX-listed companies have largely achieved baseline CRMA compliance at the disclosure level. However, compliance-oriented disclosure does not reduce operational exposure to supply disruption. Companies such as BASF, Siemens Energy and Infineon Technologies that have invested in process-level recycling infrastructure, multi-stakeholder governance architectures, and material substitution R&D are structurally better positioned for the intensification of supply constraints projected for the 2030s. Executives should treat the CRMA not as a compliance ceiling but as a strategic opportunity.

Second, relational capabilities represent an underutilized but high-return instrument for dependency management. Evidence from BASF`s multi-stakeholder sourcing governance and Airbus's co-development partnership with Aubert & Duval for titanium recycling suggests that companies that invest in the quality of upstream relationships, rather than managing suppliers at arm`s length through contractual terms, gain advantages. These include, for example, access to supply intelligence, preferential allocation during shortage periods, and collaborative substitution options that are not available to transactional buyers. Building relational capital in CRM supply chains requires continuous investment over a multi-year horizon and cannot be

rapidly set up in response to an acute supply shock. Companies that have not yet developed these relationships should fundamentally work to do so.

Third, ecological risk should be integrated into CRM supply security planning and not treated as a separate ESG concern. The NRDT lens reveals that many CRM vulnerabilities have an ecological dimension that intensifies over time. Water stress at lithium extraction sites, biodiversity loss from rare earth mining, and regulatory tightening on cobalt sourcing all reduce the long-term availability of materials that companies currently treat as given. Companies that engage with these dynamics proactively, such as BASF through the Responsible Lithium Partnership, are better positioned to anticipate and manage the supply consequences of ecological constraints.

7.3 Limitations and Directions for Future Research

Several limitations of this study must be stated, as they define the boundaries of what can be inferred from the findings.

The most fundamental limitation is the reliance on corporate self-disclosure as the sole empirical source. Annual and sustainability reports are produced under reputational incentives that may distort the relationship between disclosed and actual strategic behavior (Das et al., 2018). Companies with sophisticated investor relations functions may score higher on the coding framework for reasons unrelated to operational CRM management. The risk that higher scores reflect strong disclosure quality rather than strategic depth is particularly relevant for the macro-level categories, where the framework rewards regulatory citation rather than operational implementation. Future research should triangulate archival data with primary interviews, supply chain audits, or procurement data where accessible, to assess the correspondence between disclosure and practice.

The equal weighting of all ten coding categories is a methodological simplification that future work should revisit. Assigning identical maximum scores assumes that all dimensions are of equal strategic importance. It is theoretically plausible that technological and relational capabilities carry greater weight than normative pressure alignment in determining long-term supply security outcomes. A weighted scoring model could substantially increase the framework's explanatory power and its value as a managerial diagnostic tool.

The sample of eight companies, while theoretically appropriate for in-depth comparative analysis, limits the generalizability of the findings. The three-stage screening process that produced this sample was designed to maximize theoretical relevance rather than statistical power, and the result should accordingly be treated. Future research could extend the

framework to companies listed on other European indices such as the EUROSTOXX 50, to assess whether the patterns observed among German industrial companies are specific to the German institutional context or generalizable across European B2B markets.

The two-year observation window captures the immediate post-CRMA period but cannot differentiate between durable strategic transitions and compliance-driven disclosure adjustments. Longitudinal replication of the coding framework across the 2026-2030 reporting cycle, as the CRMA`s binding 2030 targets come into force, would provide a more robust test of whether the engagement level improvements documented here are sustainable.

Finally, the single-research design limits intercoder reliability. While the detailed codebook, predefined threshold criteria, and verbatim quotation requirement constrain subjectivity, they cannot eliminate it. Future replications of this framework should incorporate at least two independent coders. The AI-assisted document retrieval protocol documented in Appendix 8 could also be extended in future research to include a systematic comparison of AI-flagged and human-identified passages, enabling a more rigorous assessment of potential systematic biases.

8. References

Airbus SE. (2024). *Annual Report 2024*. https://www.airbus.com/sites/g/files/jlcbta136/files/2025-04/Airbus%20Annual%20Report%202024.pdf

Andrus, J. L., Callery, P. J., & Grandy, J. B. (2023). The Uneven Returns of Transparency in Voluntary Nonfinancial Disclosures. *Organization and Environment*, *36*(1), 39–68. https://doi.org/10.1177/10860266221083338

Bagge, M., Bastian, D., Bookhagen, B., Eicke, C., Elsner, H., Henning, S., Kern, M., Klitzke, P., Kuhn, K., Liesegang, M., Lutz, R., Mählitz, P., Moldenhauer, K., Pein, M., Schauer, M., Schmidt, S., Schmitz, M., Sievers, H., Szurlies, M., & Wittenberg, A. (2025). *Deutschland - Rohstoffsituation 2024*. https://doi.org/10.25928/dero-si24

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Barney, J., Wright, M., & Ketchen, D. J. (2001). The Resource-Based View of the Firm: Ten Years After 1991. *Journal of Management*, *27*(6), 625–641. https://doi.org/10.1177/014920630102700601

BASF. (2024). *BASF Report*. https://report.basf.com/2024/en/_assets/downloads/entire-full-report-basf-ar24.pdf?h=bgn5lq-I

BASF SE. (2024). *BASF Report*. https://www.basf.com/dam/jcr:a0caf160-c019-40b1-a4ea-eaedb29b0685/basf/www/global/documents/en/investor-relations/calendar-and-publications/reports/2025/BASF_Report_2024.pdf

BASF SE. (2025). *Integrated Report*. https://www.basf.com/dam/jcr:d54ddca4-f9c7-4b4f-b65e-d6ae3188ee24/basf/www/global/documents/en/investor-relations/calendar-and-publications/reports/2026/BASF_Report_2025.pdf?vid=yj4yetYQHDZenmYJh_de7TrtePiXkswC

Bazeley, P. (2013). *Qualitative Data Analysis Practical Strategies* (2nd ed.). SAGE Publications Ltd.

Beattie, V., McInnes, B., & Fearnley, S. (2004). A Methodology for Analysing and Evaluating Narratives in Annual Reports: A Comprehensive Descriptive

Profile and Metrics for Disclosure Quality Attributes. *Accounting Forum*, *28*(3), 205–236. https://doi.org/10.1016/j.accfor.2004.07.001

Bergmann, A., Stechemesser, K., & Guenther, E. (2015). Natural Resource Dependence Theory: Impacts of Extreme Weather Events on Organizations. *Journal of Business Research*, *69*(4), 1361–1366. https://doi.org/10.1016/j.jbusres.2015.10.108

Bingham, A. J. (2023). From Data Management to Actionable Findings: A Five-Phase Process of Qualitative Data Analysis. *International Journal of Qualitative Methods*, *22*. https://doi.org/10.1177/16094069231183620

BMWi. (2010). *The German Government's Raw Materials Strategy*. www.bmwi.de

BMWi. (2020). *Rohstoffstrategie Der Bundesregierung Sicherung Einer Nachhaltigen Rohstoffversorgung Deutschlands mit Nicht-Energetischen Mineralischen Rohstoffen*. https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Downloads/P-R/rohstoffstrategie-der-bundesregierung.pdf?__blob=publicationFile&v=6

Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding Responses to Supply Chain Disruptions: Insights From Information Processing and Resource Dependence Perspective. *The Academy of Management Journal*, *54*(4).

Carrara, S., Bobba, S., Blagoeva, D., Alves Dias, P., Cavalli, A., Georgitzikis, K., Grohol, M., Itul, A., Kuzov, T., Latunussa, C., Lyons, L., Malano, G., Maury, T., Prior Arce, A., Somers, J., Telsnig, T., Veeh, C., Wittmer, D., Black, C., … Christou, M. (2023). *Supply Chain Analysis and Material Demand Forecast in Strategic Technologies and Sectors in the EU: A Foresight Study*. Publications Office of the European Union.

Clemens, B. W., & Douglas, T. J. (2005). Understanding Strategic Responses to Institutional Pressures. *Journal of Business Research*, *58*(9 SPEC. ISS.), 1205–1213. https://doi.org/10.1016/j.jbusres.2004.04.002

Contala, T., Gerk, A. M., Hoettler, J., & Buettner, R. (2024). Topic Trends in Sustainability Disclosure of German DAX 40 Companies-A Text Mining-Based Analysis. *IEEE Access*, *12*, 77300–77335. https://doi.org/10.1109/ACCESS.2024.3404368

Das, R., Jain, K. K., & Mishra, S. K. (2018). Archival Research: A Neglected Method in Organization Studies. *Benchmarking: An International Journal*, *25*(1), 138–155. https://doi.org/10.1108/BIJ-08-2016-0123

Deutsche Börse Group. (2026). *DAX*. https://www.deutsche-boerse.com/dbg-en/about-us/contact/glossary/glossary-article/DAX-242866#:~:text=Stock%20index%20that%20tracks%20the,/en/dax%2D40.

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, *48*(1), 147–160. https://doi.org/10.17323/1726-3247-2010-1-34-56

Drees, J. M., & Heugens, P. P. M. A. R. (2013). Synthesizing and Extending Resource Dependence Theory: A Meta-Analysis. *Journal of Management*, *39*(6), 1666–1698. https://doi.org/10.1177/0149206312471391

Eikeng, E., Makhsoos, A., & Pollet, B. G. (2024). Critical and Strategic Raw Materials for Electrolysers, Fuel Cells, Metal Hydrides and Hydrogen Separation Technologies. *International Journal of Hydrogen Energy*, *71*, 433–464. https://doi.org/10.1016/j.ijhydene.2024.05.096

Espinoza, L. A. T. (2023). *Understanding the Methodology Behind the EU List of Critical Raw Materials*. https://scrreen.eu/wp-content/uploads/2024/01/D7_3_Working_Paper_on_the_CRM_methodology_V2.pdf

European Central Bank. (2025, June). *How Vulnerable Is the Euro Area to Restrictions on Chinese Rare Earth Exports?* https://www.ecb.europa.eu/press/economic-bulletin/focus/2025/html/ecb.ebbox202506_01~44d432008e.en.html

European Commission. (2020). *Critical Raw Materials Resilience: Charting a Path Towards Greater Security and Sustainability*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474

European Commission. (2023). *Study on the Critical Raw Materials for the EU 2023 – Final Report*.

European Commission. (2025). *New Measures To Secure Raw Materials and Strengthen the EU's Economic Security*. https://commission.europa.eu/news-and-media/news/new-measures-secure-raw-materials-and-strengthen-eus-economic-security-2025-12-03_en

European Commission, & Joint Research Centre. (2020). *Critical raw materials for strategic technologies and sectors in the EU : a foresight study*. Publications Office of the European Union.

European Parliament & Council. (2024). *Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401252

Fan, J. H., Omura, A., & Roca, E. (2023). Geopolitics and Rare Earth Metals. *European Journal of Political Economy*, *78*. https://doi.org/10.1016/j.ejpoleco.2022.102356

Federal Ministry for Economic Affairs and Climate Action. (2025). *Raw Materials – Indispensable for Germany's Industrial Future*. https://www.bundeswirtschaftsministerium.de/Redaktion/EN/Dossier/raw-materials-and-resources.html

Financial Times. (2025, May 22). *A Geopolitical Conflict Over Minerals May Finally Be a Real Threat*. Financial Times. https://www.ft.com/content/24187c18-9cfe-4b8c-8863-6f3bf09e2cd4?syn-25a6b1a6=1

Fleming, S., Hancock, A., & Wise, P. (2022, August 16). *EU Digs for More Lithium, Cobalt and Graphite in Green Energy Push*. Financial Times. https://www.ft.com/content/363c1643-75ae-4539-897d-ab16adfc1416

Fojtíková, L., Pekarčíková, K., Sousedíková, R., Vaněk, M., & Dvořáček, J. (2025). Determinants of Critical Raw Material Imports: The Case of the European Union and China. *Mineral Economics*. https://doi.org/10.1007/s13563-025-00528-4

Fouquet, R., & Hippe, R. (2022). Twin Transitions of Decarbonisation and Digitalisation: A Historical Perspective on Energy and Information in European Economies. *Energy Research and Social Science*, *91*. https://doi.org/10.1016/j.erss.2022.102736

German Council of Economic Experts. (2023). *Strengthening Potential Growth Through Capital Formation*. https://www.sachverstaendigenrat-

wirtschaft.de/fileadmin/dateiablage/gutachten/jg202324/JG202324_Chapter_2.pdf

Germann, J. (2023). Global Rivalries, Corporate Interests and Germany's 'National Industrial Strategy 2030.' *Review of International Political Economy*, *30*(5), 1749–1775. https://doi.org/10.1080/09692290.2022.2130958

Ghezzi, F., Rizzi, F., Annunziata, E., & Frey, M. (2025). Managing Dependence on Scarce Natural Resources: How Institutional Logic and Autonomy Shape Supply Chain Strategies. *Supply Chain Management: An International Journal*, *30*(7), 38–59. https://doi.org/10.1108/SCM-05-2024-0358

Ghiaie, H., & Gorelli, F. (2025, October 29). *From Chips to Turbines: Europe Depends on These Critical Rare Earth Materials*. World Economic Forum. https://www.weforum.org/stories/2025/10/from-chips-to-turbines-europe-depends-on-critical-raw-materials/

Goldman Sachs. (2024, October 28). *Weighing the Prospects for a Turnaround for Germany's Economy*. https://www.goldmansachs.com/insights/articles/weighing-the-prospects-for-a-turnaround-for-germanys-economy

Goodstein, J. D. (1994). Institutional Pressures and Strategic Responsiveness: Employer Involvement in Work-Family Issues. *The Academy of Management Journal*, *37*(2), 350–382.

Hart, S. L. (1995). A Natural Resource Based View of the Firm. *The Academy of Management Review*, *20*(4), 966–1014.

Hart, S. L., & Dowell, G. (2011). A Natural-Resource-Based View Of the Firm: Fifteen Years After. *Journal of Management*, *37*(5), 1464–1479. https://doi.org/10.1177/0149206310390219

Henkel AG & Co. KGaA. (2024a). *Annual Report*. https://www.henkel.com/resource/blob/2043318/9b8425a944b077ab7165b775398c72a1/data/2024-annual-report.pdf

Henkel AG & Co. KGaA. (2024b). *Sustainability Report*. https://www.henkel.com/resource/blob/2043310/8e58944556950ebb78141bf6a86b58a9/data/2024-sustainability-report.pdf

Henkel AG & Co. KGaA. (2025). *Annual Report*. https://www.henkel.com/resource/blob/2131544/eae43b38b5da9c89268a532af1dfbe4f/data/2025-annual-report.pdf

Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource Dependence Theory: A Review. *Journal of Management*, *35*(6), 1404–1427. https://doi.org/10.1177/0149206309343469

Hool, A., Helbig, C., & Wierink, G. (2024). Challenges and Opportunities of the European Critical Raw Materials Act. In *Mineral Economics* (Vol. 37, Number 3, pp. 661–668). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s13563-023-00394-y

Hool, A., Schrijvers, D., van Nielen, S., Clifton, A., Ganzeboom, S., Hagelueken, C., Harada, Y., Kim, H., Y. Ku, A., Meese-Marktscheffel, J., & Nemoto, T. (2022). How Companies Improve Critical Raw Material Circularity: 5 Use Cases: Findings From the International Round Table on Materials Criticality. In *Mineral Economics* (Vol. 35, Number 2). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s13563-022-00315-5

IEA. (2021). *The Role of Critical World Energy Outlook Special Report Minerals in Clean Energy Transitions*. https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf

IEA. (2024). *Global Critical Minerals Outlook 2024*. www.iea.org

ifo Institut. (2022). *Wie Abhängig Ist Deutschland Von Rohstoffimporten?* https://www.ifo.de/DocDL/ifo-Studie_Rohstoffimporte.pdf

Infineon Technologies AG. (2024). *Annual Report*. https://www.infineon.com/assets/row/public/documents/corporate/investors/annual-reports/2024/2024-infineon-annual-report-01-00-en.pdf?fileId=8ac78c8b92bced620193694bfb970095

Infineon Technologies AG. (2025a). *Annual Report*. https://www.infineon.com/assets/row/public/documents/corporate/investors/annual-reports/2025/2025-annual-report-v01-00-en.pdf

Infineon Technologies AG. (2025b). *Sustainability Report*. https://www.infineon.com/assets/row/public/documents/corporate/company/sustainability/sustainability-at-infineon.pdf

Jalali, M. S., & Akhavan, A. (2024). Integrating AI Language Models in Qualitative Research: Replicating Interview Data Analysis With ChatGPT. *System Dynamics Review*, *40*(3). https://doi.org/10.1002/sdr.1772

Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly*, *24*(4), 602–611.

Kalaitzi, D. (2018). Supply Chain Strategies in an Era of Natural Resource Scarcity. *International Journal of Operations and Production Management*, *38*(3). https://doi.org/https://doi.org/10.1108/ijopm-05-2017-0309.

Köllner, C. (2025, January 13). *Dependence on Raw Materials Greater than Ever*. Dpa. https://www.springerprofessional.de/raw-materials/automotive-industry/dependence-on-raw-materials-greater-than-ever/50440638

López-Gamero, M. D., Molina-Azorín, J. F., & Claver-Cortés, E. (2011). Environmental Uncertainty and Environmental Management Perception: A Multiple Case Study. *Journal of Business Research*, *64*(4), 427–435. https://doi.org/10.1016/j.jbusres.2010.11.009

McGinnis, M. D., & Ostrom, E. (2014). Social-Ecological System Framework: Initial Changes and Continuing Challenges. *Ecology and Society*, *19*(2). https://doi.org/10.5751/ES-06387-190230

McKinsey & Company. (2025). *Five Building Blocks To Secure Critical Raw Materials Supply for the German Industry*. https://www.mckinsey.com/de/~/media/mckinsey/locations/europe%20and%20middle%20east/deutschland/news/presse/2025/2025-10-13%20rohstoffe/mckinsey_critical%20raw%20materials_october%202025.pdf

Mercedes-Benz Group. (2025). *Annual Report 2025*. https://group.mercedes-benz.com/documents/investors/reports/annual-report/mercedes-benz/mercedes-benz-annual-report-2025-incl-combined-management-report-mbg-ag.pdf

Merck KGaA. (2024). *Annual Report*. https://www.merckgroup.com/investors/reports-and-financials/earnings-materials/2024-q4/en/2024-Q4-Report-EN.pdf

Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure As Myth and Ceremony. *American Journal of Sociology*, *83*(2), 340–363.

Mouloudi, L., & Samuel, K. E. (2022). Critical Materials: A Systematic Literature Review. *SSRN Electronic Journal [Preprint]*. https://doi.org/https://dx.doi.org/10.2139/ssrn.4108632

O'Brien, B. C., Harris, I. B., Beckman, T. J., Reed, D. A., & Cook, D. A. (2014). Standards for Reporting Qualitative Research: A Synthesis of

Recommendations. *Academic Medicine*, *89*(9), 1245–1251. https://doi.org/10.1097/ACM.0000000000000388

O'Connor, C., & Joffe, H. (2020). Intercoder Reliability in Qualitative Research: Debates and Practical Guidelines. *International Journal of Qualitative Methods*, *19*. https://doi.org/10.1177/1609406919899220

OECD. (2019). *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*. OECD Publishing. https://doi.org/10.1787/9789264307452-en

OECD. (2025a). *Economic Security in a Changing World* (New Approaches to Economic Challenges). OECD Publishing. https://doi.org/10.1787/4eac89c7-en

OECD. (2025b). *OECD Inventory of Export Restrictions on Industrial Raw Materials 2025: Monitoring the Use of Export Restrictions Amid Growing Market and Policy Tensions*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/oecd-inventory-of-export-restrictions-on-industrial-raw-materials-2025_a16b8932/facc714b-en.pdf

Oliver, C. (1991). Strategic Responses to Institutional Processes. *The Academy of Management Review*, *16*(1), 145–179.

Oliver, C. (1997). Sustainable Competitive Advantage: Combining Institutional and Resource-Based Views. *Strategic Management Journal*, *18*(9), 697–713. http://www.jstor.orgURL:http://www.jstor.org/stable/3088134http://www.jstor.org/stable/3088134?seq=1&cid=pdf-reference#references_tab_contents

Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, *325*(5939), 419–422. https://doi.org/10.1126/science.1172133

Otterbach, N., & Fröhling, M. (2025). Raw Material Criticality Assessments As Decision-Making Support for Corporate Circular Economy Strategies – a Systematic Review. *Resources, Conservation and Recycling*, *219*. https://doi.org/10.1016/j.resconrec.2025.108299

Pavel, C. C., Marmier, A., Dias, P. A., Blagoeva, D., Tzimas, E., Schüler, D., Schleicher, T., Jenseit, W., Degreif, S., & Buchert, M. (2016). *Substitution of Critical Raw Materials in Low-Carbon Technologies: Lighting, Wind Turbines and Electric Vehicles*. https://doi.org/10.2790/793319

Peteraf, M. A. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal*, *14*(3), 179–191.

Pfeffer, J., & Salancik, G. R. (1978). The External Control of Organizations: A Resource Dependence Perspective. In *The Academy of Management Review* (Vol. 4). Harper & Row.

Pommeret, A., Ricci, F., & Schubert, K. (2022). Critical Raw Materials for the Energy Transition. *European Economic Review*, *141*. https://doi.org/10.1016/j.euroecorev.2021.103991

Quick, R., Schenk, N., Schmidt, F., & Towara, T. (2018). The Impact of Corporate Governance on Auditor Choice: Evidence From Germany. *Journal of Management and Governance*, *22*(2), 251–283. https://doi.org/10.1007/s10997-017-9386-4

Rheinmetall AG. (2025). *Annual Report*. https://www.rheinmetall.com/Rheinmetall%20Group/Investor%20Relations/Veröffentlichungen/Präsentationen%20und%20Berichte/2026/GB/Rheinmetall-Annual-Report-2025.pdf

Righetti, E., & Rizos, V. (2023). The EU's Quest for Strategic Raw Materials: What Role for Mining and Recycling? *Intereconomics*, *58*(2), 69–73. https://doi.org/10.2478/ie-2023-0015

Russo, M. V, & Fouts, P. A. (1997). A Resource-Based Perspective on Corporate Environmental Performance and Profitability. *The Academy of Management Journal*, *40*(3), 534–559.

Schreiber, A., Zapp, P., Wulf, C., & Reitz, L. (2025). Analyzing Germany's Current and Future Critical Raw Material Situation for Water Electrolysis and Offshore Wind Turbines. *International Journal of Hydrogen Energy*, *128*, 511–522. https://doi.org/10.1016/j.ijhydene.2025.04.248

Schulze, M. (2024). *Security of Supply in Times of Geo-economic Fragmentation*. https://www.swp-berlin.org/publications/products/comments/2024C15_SecurityOfSupply.pdf

Sherer, P. D., & Lee, K. (2002). Institutional Change in Large Law Firms: A Resource Dependency and Institutional Perspective. *The Academy of Management Journal*, *45*(1), 102–119.

Siemens AG. (2024). *Sustainability Report*. https://assets.new.siemens.com/siemens/assets/api/uuid:32a7154d-edba-47bc-8e9b-9761617ba774/sustainability-report.pdf

Siemens Energy AG. (2024a). *Annual Report*. https://www.siemens-energy.com/global/en/home/general/us-legal-notice-reports.html

Siemens Energy AG. (2024b). *Sustainability Report*. https://www.siemens-energy.com/global/en/home/general/us-legal-notice-reports.html

Siemens Energy AG. (2025). *Annual Report*. https://assets.siemens-energy.com/dam/32b27e9a-af91-4915-8b51-b3af012d0d98/A-Siemens_Energy_Annual_Report_2025-pdf_Original%20file.pdf

Statistics Explained. (2025, June). *National Accounts and GDP Statistics Explained*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=National_accounts_and_GDP

Suchman, M. C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. *The Academy of Management Review*, *20*(3), 571–610.

Tashman, P. (2020). A Natural Resource Dependence Perspective of the Firm: How and Why Firms Manage Natural Resource Scarcity. *Business and Society*, *60*(6), 1279–1311. https://doi.org/10.1177/0007650319898811

Teece, D. J., Pisano, G., Shuen, A., Teece1, D. J., Pisano2, G., & Shuen3, A. (1997). Dynamic Capabilities and Strategic Management. *Source: Strategic Management Journal*, *18*(7), 509–533. http://www.jstor.orgURL:http://www.jstor.org/stable/3088148http://www.jstor.org/page/info/about/policies/terms.jsp

von der Leyen, U. (2022). State of the European Union address. In *European Parliament*.

Wachinger, J., Bärnighausen, K., Schäfer, L. N., Scott, K., & McMahon, S. A. (2025). Prompts, Pearls, Imperfections: Comparing ChatGPT and a Human Researcher in Qualitative Data Analysis. *Qualitative Health Research*, *35*(9), 951–966. https://doi.org/10.1177/10497323241244669

Webster, F., & Wind, Y. (1972). A General Model for Understanding Organizational Buying Behavior. *Journal of Marketing*, *36*.

Webster, J., & Watson, R. T. (2002). Analyzing the Past To Prepare for the Future: Writing a Literature Review. *Source: MIS Quarterly*, *26*(2), xiii–xxiii.

WEF. (2024). *Translating Critical Raw Material Trade Into Development Benefits*. https://www3.weforum.org/docs/WEF_Translating_Critical_Raw_Material_Demand_2024.pdf

Welch, C. (2000). The Archaeology of Business of Archival Records in Networks: The Use Case Study Research. *Journal of Strategic Marketing*, *8*(2), 197–208. https://doi.org/10.1080/0965254X.2000.10815560

Wen, C., Clough, P., Paton, R., & Middleton, R. (2025). Leveraging Large Language Models for Thematic Analysis: A Case Study in the Charity Sector. In *AI and Society*. Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s00146-025-02487-4

Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal*, *5*(2), 171–180. http://www.jstor.orgURL:http://www.jstor.org/stable/2486175http://www.jstor.org/stable/2486175?seq=1&cid=pdf-reference#references_tab_contents

Zhang, H., Wu, C., Xie, J., Lyu, Y., Cai, J., & Carroll, J. M. (2025). Harnessing the Power of AI in Qualitative Research: Exploring, Using and Redesigning ChatGPT. *Computers in Human Behavior: Artificial Humans*, *4*. https://doi.org/10.1016/j.chbah.2025.100144

Zhu, X., Ding, Q., & Chen, J. (2022). How Does Critical Mineral Trade Pattern Affect Renewable Energy Development? The Mediating Role of Renewable Energy Technological Progress. *Energy Economics*, *112*. https://doi.org/10.1016/j.eneco.2022.106164

9. Appendices

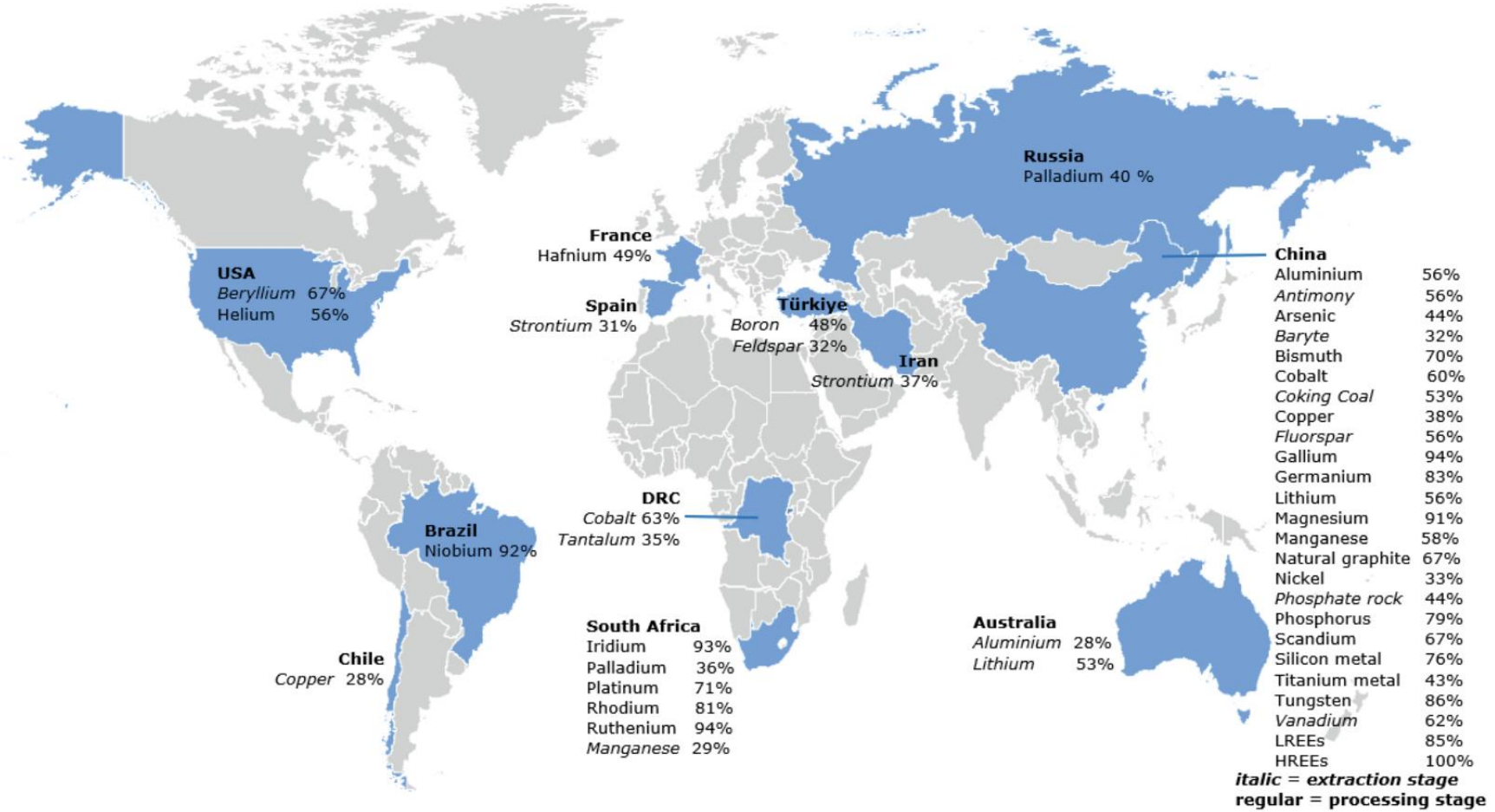
9.1 Tables and figures

9.1.1 Appendix 1: Critical Raw Materials Listed under the EU Critical Raw Materials Act

- Antimony
- **Arsenic**
- Baryte
- Bauxite
- Beryllium
- Bismuth
- Boron/Borate
- Cobalt
- **Coking Coal**
- **Copper**
- **Feldspar**
- Fluorspar
- Gallium
- Germanium
- Hafnium
- **Helium**
- Heavy rare earth elements
- Light rare earth elements
- **Lithium**
- Magnesium
- **Manganese**
- Natural Graphite
- **Nickel**
- Niobium
- Phosphate Rock
- Platinum group metals
- **Phosphorus**
- Scandium
- Silicon metal
- Strontium
- Tantalum
- Titanium metal
- Tungsten
- Vanadium

Note: Entries in Bold indicate strategic raw materials

9.1.2 Appendix 2: Geographic Overview of Global CRM Supply



Source: Own screenshot based on Study on the Critical Raw Materials for the EU from the European Commission (2023)

9.1.3 Appendix 3: Literature Overview: Resource Dependence Theory and Its Natural Extension

Article	Author	Journal / Publisher	Resource Dependence Theory	Natural Resource Dependence Theory
Natural Resource Dependence Theory: Impacts of Extreme Weather Events on Organizations	Bergmann et al. (2015)	Journal of Business Research		X
Understanding Responses to Supply Chain Disruptions: Insights From Information Processing and Resource Dependence Perspective	Bode et al. (2011)	Academy of Management Journal	X	
Synthesizing and Extending Resource Dependence Theory: A Meta-Analysis	Drees & Heugens (2013)	Journal of Management	X	
Managing Dependence on Scarce Natural Resources: How Institutional Logic and Autonomy Shape Supply Chain Strategies	Ghezzi et al. (2025)	Supply Chain Management: An International Journal		X
Resource Dependence Theory: A Review	Hillman et al. (2009)	Journal of Management	X	
Environmental Uncertainty and Environmental Management Perception: A Multiple Case Study	López-Gamero et al. (2011)	Journal of Business Research	X	
Social-Ecological System Framework: Initial Changes and Continuing Challenges	McGinnis & Ostrom (2014)	Ecology and Society		X
A General Framework for Analyzing Sustainability of Social-Ecological Systems	Ostrom (2009)	Science		X
The External Control of Organizations: A Resource Dependence Perspective	Pfeffer & Salancik (1978)	Harper & Row	X	
A Natural Resource Dependence Perspective of the Firm: How and Why Firms Manage Natural Resource Scarcity	Tashman (2020)	Business & Society		X

9.1.4 Appendix 4: Literature Overview: The Resource-Based View and Its Natural Extension

Article	Author	Journal / Publisher	Resource Based View	Natural Resource Based View
The Resource-Based View of the Firm: Ten Years After 1991	Barney et al. (2001)	Journal of Management	X	
Firm Resources and Sustained Competitive Advantage	Barney (1991)	Journal of Management	X	
A Natural-Resource-Based View Of the Firm: Fifteen Years After	Hart & Dowell (2011)	Journal of Management		X
A Natural Resource Based View of the Firm	Hart (1995)	Academy of Management Review		X
Sustainable Competitive Advantage: Combining Institutional and Resource-Based Views	Oliver (1997)	Strategic Management Journal	X	
The Cornerstones of Competitive Advantage: A Resource-Based View	Peteraf (1993)	Strategic Management Journal	X	
A Resource-Based Perspective on Corporate Environmental Performance and Profitability	Russo & Fouts (1997)	The Academy of Management Journal		X
Dynamic Capabilities and Strategic Management	Teece et al. (1997)	Strategic Management Journal	X	
A Resource-Based View of the Firm	Wernerfelt (1984)	Strategic Management Journal	X	

9.1.5 Appendix 5: Coding Scheme: Theoretical Categories and Scoring Criteria

Macro Level

Higher Order Code Category	Score	Code Definition	Example Data Segment
Response to Coercive Pressure	0	No reference to CRM-relevant regulation	
	1	General mention of regulatory environment without CRM-specific linkage or action	"We monitor evolving regulatory requirements related to raw material sourcing."
	2	Named regulation (e.g. CRMA, supply chain due diligence law) AND CRM-related action, target or compliance mechanism	"In response to the EU Critical Raw Materials Act, we have mapped our exposure to 17 designated strategic raw materials and established internal compliance targets aligned with the 2030 benchmarks."
Response to Mimetic Pressure	0	No reference to peers, benchmarks, or industry norms	
	1	Implicit or general reference to what peers, competitors, or the industry are doing, without CRM-specific imitation	"We benchmark our performance against competitors."
	2	Explicit reference to competitor or peer behavior as a driver of CRM strategy, OR participation in cross-industry benchmarking specifically to align with what leading companies do	"Following the approaches adopted by leading peers in our sector, we have begun mapping our CRM exposure to CRMA-designated materials and adjusted our sourcing strategy accordingly."
Response to Normative Pressure	0	No CRM-related ESG commitment	
	1	Generic sustainability commitment without CRM-specific operationalization	"We are committed to responsible sourcing across our supply chain."
	2	CRM-specific standard, stakeholder engagement, OR governance mechanism (audit, reporting)	"We apply the Responsible Minerals Initiative standard across all cobalt and lithium suppliers and engage quarterly with institutional investors on our raw material exposure."

Meso Level

Higher Order Code Category	Score	Code Definition	Example Data Segment
Material criticality	0	No CRM relevance identified	
	1	CRM mentioned without clear production dependency or substitutability constraint	"Rare earth elements and battery metals are important to our production."
	2	CRM linked explicit to production dependency AND low substitutability OR technical constraint	"Rare earth elements are classified as high-criticality inputs for our permanent magnet production in wind turbines. No technically equivalent substitute currently exists at commercial scale."
Supply concentration	0	No CRM sourcing structure disclosed	
	1	General mention of geographic or supplier CRM risk	"We are aware of geographic concentration CRM risks in our upstream supply chain."
	2	Quantified concentration OR explicit single/limited supplier CRM dependence	"Approximately 78% of our processed silicon metal is sourced from a single country. We currently work with three active suppliers for this material, of which two are in the same region."
Ecological risk	0	No ecological constraints mentioned	
	1	Environmental risks mentioned without CRM linkage	"Climate change may affect our ability to source certain materials in the future."
	2	Explicit link between ecological constraint and CRM supply risk OR strategic planning	"Lithium extraction in Brazil, where two of our primary suppliers operate, faces increasing water stress. We have incorporated this ecological constraint into our supply security scenario planning."
Power gap	0	No mention of supplier power	
	1	Raw material risk acknowledged (price volatility, disruption) without power interpretation	"Raw material price volatility represents a risk to our cost base."
	2	Explicit CRM power asymmetry described and documented mitigation strategy	"For cobalt, we face a significant power asymmetry relative to our upstream suppliers. To reduce this leverage, we have entered long-term agreements."

Micro Level

Higher Order Code Category	Score	Code Definition	Example Data Segment
Technological capabilities	0	No CRM-related technological activity	
	1	General R&D mentioned without CRM-specific application	"We invest in R&D to improve material efficiency across our product portfolio."
	2	Concrete technological solution affecting CRM use (substitution, reduction, processing) with technical detail and/or metric	"Our declared rare earth substitution program achieved. 15% reduction in dysprosium content per traction motor unit in 2024. A patent application was filed for Q3 2024."
Relational capabilities	0	No CRM-related partnerships or engagement	
	1	General supplier relationships without CRM-specific strategic function	"We maintain long-standing relationships with our key raw material suppliers."
	2	Formalized collaboration (JV, alliance, co-development, policy-engagement) with CRM relevance	"In 2024, we entered a co-development joint venture with a lithium producer in Chile to secure upstream access and co-invest in processing infrastructure. We also participate in the EU Battery Alliance to shape upstream policy conditions."
Sustainability capabilities	0	No CRM-related sustainability activity	
	1	General sustainability statements without CRM-specific system or metric	"We are committed to responsible sourcing and recycling as part of our sustainability strategy."
	2	Formalized system (KPI, circular model, audit, traceability) linked to CRM flows	"Secondary lithium now accounts for 22% of our battery material inputs, tracked as a defined KPI. Our take-back program for end-of-life battery systems operates in six markets."

Aggregate Scoring guide

Aggregate Points	Category	Description
0-7	Low Engagement	Reactive or disclosure-only CRM management
8-13	Moderate Engagement	Structured responses in some but not all dimensions
14-20	High Engagement	Integrated, multi-dimensional CRM strategy with documented capabilities

9.1.6 Appendix 6: Overview of Annual and Sustainability Reports Analyzed

Company	Year	Source
Airbus SE	*2024*	Integrated Report: https://www.airbus.com/sites/g/files/jlcbta136/files/2025-04/Airbus%20Annual%20Report%202024.pdf
	2025	No report published as of May 2026
BASF SE	*2024*	Integrated Report: https://www.basf.com/dam/jcr:a0caf160-c019-40b1-a4ea-eaedb29b0685/basf/www/global/documents/en/investor-relations/calendar-and-publications/reports/2025/BASF_Report_2024.pdf
	2025	Integrated Report: https://www.basf.com/dam/jcr:d54ddca4-f9c7-4b4f-b65e-d6ae3188ee24/basf/www/global/documents/en/investor-relations/calendar-and-publications/reports/2026/BASF_Report_2025.pdf?vid=yj4yetYQHDZenmYJh_de7TrtePiXkswC
Henkel AG & Co. KGaA	*2024*	Annual Report: https://www.henkel.com/resource/blob/2043318/9b8425a944b077ab7165b775398c72a1/data/2024-annual-report.pdf Sustainability Report: https://www.henkel.com/resource/blob/2043310/8e58944556950ebb78141bf6a86b58a9/data/2024-sustainability-report.pdf
	2025	Integrated Report: https://www.henkel.com/resource/blob/2131544/eae43b38b5da9c89268a532af1dfbe4f/data/2025-annual-report.pdf
Infineon Technologies AG	*2024*	Annual Report: https://www.infineon.com/assets/row/public/documents/corporate/investors/annual-reports/2024/2024-infineon-annual-report-01-00-en.pdf?fileId=8ac78c8b92bced620193694bfb970095 Sustainability Report: https://www.infineon.com/assets/row/public/documents/corporate/investors/annual-reports/2024/2024-sustainability-at-infineon-v01-00-en.pdf?fileId=8ac78c8b92bced620193690fe6b8008a
	2025	Annual Report: https://www.infineon.com/assets/row/public/documents/corporate/investors/annual-reports/2025/2025-annual-report-v01-00-en.pdf Sustainability Report: https://www.infineon.com/assets/row/public/documents/corporate/company/sustainability/sustainability-at-infineon.pdf
Merck KGaA	*2024*	Integrated Report: https://www.merckgroup.com/investors/reports-and-financials/earnings-materials/2024-q4/en/2024-Q4-Report-EN.pdf
	2025	Integrated Report: https://www.merckgroup.com/investors/reports-and-financials/earnings-materials/2025-q4/en/2025-Q4-Report-EN.pdf
Rheinmetall AG	*2024*	Integrated Report: https://www.rheinmetall.com/Rheinmetall%20Group/Investor%20Relations/Veröffentlichungen/Präsentationen%20und%20Berichte/2025/GB/Rheinmetall-Annual-Report-2024.pdf
	2025	Integrated Report: https://www.rheinmetall.com/Rheinmetall%20Group/Investor%20Relations/Veröffentlichungen/Präsentationen%20und%20Berichte/2026/GB/Rheinmetall-Annual-Report-2025.pdf
Siemens AG	*2024*	Annual Report: https://assets.new.siemens.com/siemens/assets/api/uuid:344347ec-a1bd-44cb-aaaa-711d1b3ec1b8/Siemens-Annual-Report-2024.pdf Sustainability Report: https://assets.new.siemens.com/siemens/assets/api/uuid:32a7154d-edba-47bc-8e9b-9761617ba774/sustainability-report.pdf
	2025	Integrated Report: https://assets.new.siemens.com/siemens/assets/api/uuid:428ea18a-e7ab-4f93-a160-33908f1c3540/Siemens-Annual-Report-2025.pdf
Siemens Energy AG	*2024*	Annual Report: https://www.siemens-energy.com/global/en/home/general/us-legal-notice-reports.html Sustainability Report: https://www.siemens-energy.com/global/en/home/general/us-legal-notice-reports.html
	2025	Integrated Report: https://assets.siemens-energy.com/dam/32b27e9a-af91-4915-8b51-b3af012d0d98/A-Siemens_Energy_Annual_Report_2025-pdf_Original%20file.pdf

9.1.7 Appendix 7: Final DAX Sample Selection

DAX 40 – Strategic Sector & Technology Relevance Tracker						
Company	Renewable Energy		E-mobility		Defence & Aerospace	
Company Name	Relevant?	Technology & Description	Relevant?	Technology & Description	Relevant?	Technology & Description
Adidas AG	No		No		No	
Airbus SE	Yes	PV, ICT	Yes	Batteries, Fuel Cells, ICT	Yes	Batteries, Fuel Cells, PV, Robotics, Drones, 3D Printing, ICT
BASF SE	Yes	Batteries, Fuel Cells, Wind, PV, 3D Printing, ICT	Yes	Batteries, Fuel Cells, Traction Motors, 3D Printing, ICT	Yes	Batteries, Fuel Cells, 3D Printing
Bayer AG	No		No		No	
Beiersdorf AG	No		No		No	
BMW AG	Yes	Batteries, ICT	Yes	Batteries, Fuel Cells, Traction Motors, ICT	No	
Brenntag SE	Yes	Batteries, PV	Yes	Batteries, 3D Printing	No	
Continental AG	Yes	Fuel Cells, Wind, Robotics, ICT	Yes	Batteries, Fuel Cells, Traction Motors, Robotics, 3D Printing, ICT	No	
Covestro AG	Yes	Batteries, Fuel Cells, Wind, PV, ICT	Yes	Batteries, 3D Printing, ICT	No	
Daimler Truck Holding AG	Yes	Batteries	Yes	Batteries, Fuel Cells, Traction Motors, 3D Printing, ICT	No	
Deutsche Post AG	No		No		No	
Deutsche Telekom AG	No		No		No	
E.ON SE	Yes	Batteries, Fuel Cells, Wind, PV, ICT	Yes	ICT	No	
Fresenius SE & Co. KGaA	No		No		No	
Heidelberg Materials AG	Yes	Wind	No		No	
Henkel AG / Co. KGaA	Yes	Batteries, Fuel Cells, Wind, PV, 3D Printing, ICT	Yes	Batteries, Fuel Cells, 3D Printing, ICT	Yes	3D Printing
Infineon Technologies AG	Yes	Batteries, Fuel Cells, Wind, PV, Robotics, ICT	Yes	Batteries, Fuel Cells, Traction Motors, Robotics, ICT	Yes	ICT

	DAX 40 – Strategic Sector & Technology Relevance Tracker					
Company	Renewable Energy		E-mobility		Defence & Aerospace	
Company Name	Relevant?	Technology & Description	Relevant?	Technology & Description	Relevant?	Technology & Description
Mercedes Benz Group AG	Yes	Batteries, ICT	Yes	Batteries, Traction Motors, ICT	No	
Merck KGaA	Yes	Batteries, Fuel Cells, PV	Yes	Batteries, Fuel Cells ICT	Yes	PV, ICT
MTU Aero Engines AG	No		Yes	Fuel Cells, Traction Motors, Robotics	Yes	Fuel Cells, Robotics, Drones, 3D Printing, ICT
Porsche AG	No		Yes	Batteries, Traction Motors, 3D Printing, ICT	No	
Qiagen N.V.	No		No		No	
Rheinmetall AG	Yes	Fuel Cells, Wind	Yes	Batteries, Fuel Cells, Traction Motors, Robotics, 3D Printing, ICT	Yes	Batteries, Fuel Cells, Robotics, Drones, 3D Printing, ICT
RWE AG	Yes	Batteries, ICT	No		No	
SAP SE	No		No		No	
Sartorius AG Vz	No		No		No	
Siemens AG	Yes	Wind, PV, ICT	Yes	Batteries, Fuel Cells, Traction Motors, Robotics, 3D Printing, ICT	Yes	Robotics, 3D Printing, ICT
Siemens Energy AG	Yes	Batteries, Fuel Cells, Wind, PV, Robotics, 3D Printing, ICT	Yes	Fuel Cell, 3D Printing	Yes	3D Printing
Siemens Healthineers AG	No		No		No	
Symrise AG	No		No		No	
Volkswagen AG Vz	Yes	Batteries, ICT	Yes	Batteries, Traction Motors, 3D Printing, ICT	No	
Vonovia SE	No		No		No	
Zalando SE	No		No		No	

9.1.8 Appendix 8: AI-Assisted Document Processing: Prompt Protocol for Report Flagging

Stage 0: Role and context priming

"You are assisting a researcher conducting a theory-driven archival analysis of how DAX-listed B2B companies respond to critical raw material (CRM) dependency. The analysis is grounded in five theoretical perspectives: institutional theory, resource dependence theory, natural resource dependence theory, the resource-based view, and the natural resource-based view. You will be given excerpts from annual and sustainability reports published between 2024 and 2025. Your task is to identify and extract passages that correspond to predefined theoretical categories. You do not assign a score, you do not interpret strategic intent, and you do not summarize beyond what is explicitly stated in the text. For every passage you flag, you must provide the verbatim quote, the page number, and the section heading. If no relevant passage exists, respond with "No relevant disclosure identified."

Stage 1: Document orientation

"The document is the (Year) Annual/Sustainability/Integrated Report of (Company). Please list all section headings and subheadings related to: (1) supply chain and procurement, (2) raw materials and sourcing, (3) sustainability and environmental management, (4) risk management, and (5) regulatory compliance. Provide page numbers for each. Do not summarize content at this stage."

Stage 2: Macro Level

"Identify passages that describe how the company responds to external pressures regarding critical raw materials. Distinguish between three types: (a) coercive pressures, meaning references to regulation such as the EU Critical Raw Materials Act; (b) mimetic pressures, meaning references to industry benchmarks, peer practices, or alignment with what competitors do; and (c) normative pressures, meaning references to industry standards, certifications or stakeholder expectations. For each passage, provide the verbatim quote, the page, and label what mechanism it corresponds to. Do not assume contexts not explicitly supported by the text."

Stage 3: Meso Level

"Identify passages relevant to the company's dependency on critical raw materials. Search separately for each of the following four dimensions and label findings accordingly. (1) Criticality: statements about the strategic or economic importance of specific raw materials to the company's products or processes. (2) Ecological risk: statements about environmental degradation, climate-related supply disruption, water stress, or biodiversity impacts at extraction or processing sites. (3) Power gap: statements about supplier negotiating power, price volatility, long-term contracts, or asymmetries in supplier relationships. (4) Concentration: statements about geographic concentration of sourcing,

single-country dependency, or supplier base narrowness. For each finding, provide the verbatim quote, page number, and the specific raw material named, if any.”

Stage 4: Micro Level

“Identify passages that describe company-specific capabilities related to managing critical raw material dependency. Search separately for: (1) technological capabilities, including process technologies, recycling infrastructure, substitution research, R&D investment, and material efficiency programs; (2) relational capabilities, including supplier partnerships, joint ventures, long-term agreements, supplier development programs, and collaborative initiatives; (3) sustainability capabilities, including material tracking systems, life-cycle assessments, circular economy programs, certification schemes, and disclosure infrastructure. For each finding, provide the verbatim quote, the page, and indicate whether the capability is described as existing, under development, or planned."

Stage 5: Definition of output format

"Return all findings in the following format for each flagged passage: Company: (name), Year: (year). Framework level: (macro/meso/micro). Category: (specific construct). Verbatim quote: '(exact text)'. Page: (number). Section: (heading). If multiple passages support the same category, list them separately rather than merging."

Stage 6: Transparency and self-check

“After completing the extraction, list any passages where you were uncertain about classification and explain the source of the uncertainty. Do not resolve the uncertainty yourself. Additionally, confirm that every quote you provided appears verbatim in the source document and that no quote was paraphrased or reconstructed."

9.2 Supporting documents

9.2.1 Appendix 9: Illustrative Application of the Coding Framework – Airbus SE 2024

Code	Quote (verbatim)	Page
Response to Coercive Pressure	"In the context of the EU Critical Raw Material regulation, (…) internal methodology to assess the criticality of raw materials (…) regularly updated watchlist of the most critical raw materials (…).	p.168
Response to Mimetic Pressure	"(….) benchmark analysis derived from first CSRD reports from other European companies."	p.123
Response to Normative Pressure	"(…) the Company is also a member of the (…), the Responsible Business Alliance and the Responsible Mineral Alliance. (…) an active member of industry trade associations which regularly hold focused discussions on (…) environmental-related risks within the aerospace and defence industry. These include (…)"	p.114
	"The Company is a founding member of the IAEG, (…) manage environmental obligations and deploy best practices. (…) for Environment, Social and Governance (ESG) engagement strengthens business resilience and optimises resources and costs for suppliers."	pp.114-115
Material criticality	"The aviation sector's use of titanium (…) a relatively high percentage of the resource's global stock and may affect global resource availability. (…) supply disruption could have an impact on aircraft production and deliveries (…)."	p.120
	"(…) including 3TG are necessary for the proper functioning of components (…)"	p.195
Supply concentration	"(…) titanium (…) is sourced from Russia, both directly and indirectly through the Company's suppliers. (…) de-risking plan to avoid any shortage in the supply chain. (…)."	p.15
Ecological risk	"The use of secondary materials in the titanium production (…) reduce energy needs by up to 90% compared to processing virgin titanium. (…)"	p.14
	"(…) climate change, water, soil and air pollution, resource scarcity and loss of biodiversity. (…) development of products and services that minimize environmental impacts, (…)."	p.140
Power gap	"(…) manages these risks in the procurement process (…) uses derivative instruments in order to mitigate the risks associated with the purchase of raw materials."	p.69
	"Long-term contracting or partnerships also help reduce inflow risks, including related to the timely delivery of components."	p.117
Technological capabilities	"(…) Airbus created a titanium revert loop, which recycles titanium scraps and chips generated by production activities at Airbus' plants. (…) "	p.14
	"(…) developing, in collaboration with relevant suppliers, closed-loop scrap recycling systems for titanium, aiming to reduce the need and reliance on primary alloys by increasing the use of secondary flows within the aerospace sector (…)."	p.168

Relational capabilities	"Through a partnership with Aubert & Duval, these materials can be recycled and reinjected into the aerospace supply chain (…)"	p.14
Sustainability capabilities	"(…) invests in lifecycle assessments (LCA) for environmental impact accounting (…)."	p.140
	"(…) deploying frameworks enabling design choices to reduce the footprint of operations, projects and products and optimise aspects such as product end-of-life management and critical raw materials usage. (…)"	p.140

9.2.2 Appendix 10: Application of the Coding Framework – Airbus SE

CRM Coding Sheet — Airbus SE

			2024			
Level	Category	#	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1	2	In the context of the EU Critical Raw Material regulation, the Company has established and maintains	168	6.2.6.3.1 Actions and resources (E5-2)
		2		The ECSC also reviewed the Company's strategy linked to critical materials sourcing, as well as the Company's	45	2.1.4 Board Committees
		3		The SCoC (Supplier Code of Conduct) also formally requires suppliers to comply with applicable laws and	195	6.3.3.3 Policies related to value chain workers
		4		There is a risk that the Company or its suppliers may not be in a position to substitute substances of concern or of	120	6.1.1.3.2 SBM-2: Interests and views of
		10				
Macro	Mimetic pressure response	1	1	In 2024, the Company updated its double-materiality assessment and refined its methodology to align it with	123	General information
		2				
Macro	Normative pressure response	1	2	The Company invests in lifecycle assessments (LCA) for environmental impact accounting associated with a	140	6.2.1 Policies
		2		As the Company's commercial aircraft business and its two Divisions (Airbus Helicopters and Airbus Defence	117	6.1.1.3.1 SBM-1: Strategy, business
		3		All considerations for optimising material use shall also, under no circumstance, be detrimental to product safety	167	6.2.6.2 Policies (E5-1)
		4		DNSH Transition to a circular economy. The Company assessed the possibility and actual use of secondary raw	172	6.2.7.2 Regulatory disclosure
		5		OECD (Organisation for Economic Cooperation and Development)	179	6.3.1 Policies
		6		To support its actions in this respect, the Company is also a member of the Global Business Initiative for	114	6.1.1.2.4 GOV-4: Statement on due
		7		The Company is a founding member of the IAEG, which is working on development and promotion of common	114-115	6.1.1.2.4 GOV-4: Statement on due
		10				

CRM Coding Sheet — Airbus SE

			2024			
Level	Category	#	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1	2	While aerospace represents a small fraction of the global volumes for most materials, it is among the main users for	166	6.2.6 ESRS E5 - Resource use and
		2		Resource inflow: The aviation sector's use of titanium in the production of aircraft components represents a relatively	120	6.1.1.3.3 SBM-3: Material impacts, risks
		3		Optimising the use of such high-value materials is directly linked to the Company's competitiveness, while securing	167	6.2.6 ESRS E5 - Resource use and
		4		The Company is dedicated to optimising material use as part of its ongoing resource management strategy. The	168	6.2.6.3.1 Actions and resources (E5-2)
		5		In the context of the EU Critical Raw Material regulation, the Company has established and maintains an internal	168	6.2.6.3.1 Actions and resources (E5-2)
		6		Premium AEROTEC Industry plays a significant role within new concepts regarding metallic and composite	15	1.2 Airbus (Commercial Aircraft)
		7		The ability of these suppliers and subcontractors to meet their contractual obligations may be negatively impacted	67	3.1.2 Business and operations-related risks
		8		Indeed some minerals including 3TG are necessary for the proper functioning of components within its products; the	195	6.3.3.3 Policies related to value chain workers
		10				
Meso	Ecological risk	1	2	The use of these materials, and the impacts associated with their production or end-of-life, are justified by their	166	ESRS E5 - Resource use and circular economy
		2		The use of secondary materials in the titanium production process can reduce energy needs by up to 90% compared	14	Sustainability in Action
		3		E5 - Resource & circularity Impact : Resource inflow: The aviation sector's use of titanium in the production of	120	6.1.1.3.3 SBM-3: Material impacts, risks
		4		The policy acknowledges that our planet is facing substantial challenges such as climate change, water, soil	140	6.2.1 Policies
		5		The Policy focuses on minimising resource depletion (including virgin resources) and the increased use of	167	6.2.6.2 Policies (E5-1)
		6		The depth of the Company's supply chain increases the complexity and, in many areas, the difficulty of identifying	117	6.1.1.3.1 SBM-1: Strategy, business
		7		Mitigating risks of child labour related to sourcing of raw materials. During 2024, the Company continued to deepen	198	6.3.3.6 Taking action on material impacts on
		8		The foreseen consequences of climate change include long-term shifts in climate patterns (e.g., change in	73	3.1.4 Environment, human rights, and
		9		The Company evaluated its economic activities with respect to the sustainable use and protection of water and	172	6.2.7.2 Regulatory disclosure
		10		Raw material management including substitution. Where technically feasible, the Company reduces the solvent	162	6.2.3.3.2 Actions and reousrces (E2-2)
		12				

CRM Coding Sheet — Airbus SE

			2024			
Level	Category	#	Score	Quote (verbatim)	Page	Section
Meso	Supply concentration	1	2	The war in Ukraine has increased the Company's exposure to supply chain disruption risk given that part	15	2.1 Basis of Preparation
		2		While geopolitical risks, and associated de-risking activities, are integrated into the Company's sourcing	65	3.1.1 Geopolitical, global economic, and
		3		An example of this risk arose with Russia's invasion of Ukraine in early 2022, with the resulting export control	65	3.1.1 Geopolitical, global economic, and
		4		While the Company's products and services are sold all over the world, the majority of its supply chain is based	117	6.1.1.3.1 SBM-1: Strategy, business
		5		Resource inflow: The aviation sector's use of titanium in the production of aircraft components	120	6.1.1.3.3 SBM-3: Material impacts, risks
		6		This initiative is driven by the increasing cross-boundary measures impacting the supply of critical raw materials.	168	6.2.6.3.1 Actions and resources (E5-2)
		7		The Company is developing, in collaboration with relevant suppliers, closed-loop scrap recycling systems	168	6.2.6.3.1 Actions and resources (E5-2)
		8		Due to its global footprint and the nature of its business, the Company's operations are dependent on the	67	3.1.2 Business and operations related risks
		9		To the extent local or regional wars or armed conflicts result in reduced demand for air travel (directly or	65	3.1.1 Geopolitical, global economic, and
		10		If sanctions, export control laws and regulations meaningfully limit the Company's access to export	71	3.1.3 Legal, regulatory and governance risks
Meso	Power gap	1	1	In addition to the performance risks described above, the Company is exposed to the risk of increased costs in	68	3.1.2 Business and operations related risks
		2		Further, macroeconomic or local economic factors (including economic recessions and inflation or changes in	67	3.1.2 Business and operations related risks
		3		Despite the Company's efforts to continually improve its supply chain resilience, including by having robust	68	3.1.2 Business and operations related risks
		4		Commodity price risk — The Company is exposed to risk relating to fluctuations in the prices of commodities used	69	3.7.1 Financial Risk Management
		5		Long-term contracting or partnerships also help reduce inflow risks, including related to the timely delivery of	117	6.1.1.3.1 SBM-1: Strategy, business
		6		Likewise, the Company attempts, where possible, to increase its resilience against production disruptions and	68	3.1.2 Business and operations related risks
		7		Further, changes to the Company's production or development schedules may impact suppliers and	68	3.1.2 Business and operations related risks
		8		The Company maintains dedicated risk identification and mitigation measures meant to safeguard its operations,	67	3.1.2 Business and operations related risks
		9		There is a risk that the Company or its suppliers may not be in a position to substitute substances of concern or of	120	6.1.1.3.2 SBM-2: Interests and views of
		10				

CRM Coding Sheet — Airbus SE

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score		Page	Section
Micro	Technological capabilities	1		Airbus works with a lifecycle perspective to improve circularity and reduce waste. In 2024,	14	Sustainability in action				
		2		In its ongoing efforts to support the aerospace sector, the Company is actively engaged in strategic raw material	168	6.2.6.4.1 Actions and resources (E5-2)				
		3		Waste generated by the Company's industrial processes often includes high-value materials, including titanium, so	168	6.2.6.4.1 Actions and resources (E5-2)				
		4		The Company is dedicated to optimising material use as part of its ongoing resource management strategy. The design	168	6.2.6.4.1 Actions and resources (E5-2)				
		5		"Avoid" or material use optimisation - Weight reduction through material use optimisation has always been a priority	167	6.2.6 ESRS E5 - Resource use and circular				
		6	2	Premium AEROTEC Industry plays a significant role within new concepts regarding metallic and composite	15	1.2 Airbus (Commercial Aircraft)				
		7		In 2024, an interactive high5+ Cockpit tool was launched, providing up-to-date data and insights into progress against	14	Sustainability in Action				
		8		Airbus continued to invest in its service and end-of-life offering in 2024, with the opening	14	Sustainability in Action				
		9		Waste generated by the Company's industrial processes often includes high-value materials, so optimising their	167	6.2.6 ESRS E5 - Resource use and circular				
		10		DNSH Transition to a circular economy. The Company assessed the possibility and actual use of secondary raw	172	6.2.7.2 Regulatory disclosure				
		11		Raw material management including substitution. Where technically feasible, the Company reduces the solvent	162	6.2.3.3.2 Actions and resources (E2-2)				
Micro	Relational capabilities	1		Through a partnership with Aubert & Duval, these materials can be recycled and reinjected into the aerospace supply	14	Sustainability in Action				
		2		In its ongoing efforts to support the aerospace sector, the Company is actively engaged in strategic raw material	168	6.2.6.4.1 Actions and resources (E5-2)				
		3		The Company's Sustainable Supply Chain Roadmap is based on a three-step approach: supplier commitment, supplier	117	6.1.1.3.1 SBM-1: Strategy, business model				
		4		Long-term contracting or partnerships also help reduce inflow risks, including related to the timely delivery of	117	6.1.1.3.1 SBM-1: Strategy, business model				
		5		The Company has established regional procurement offices in North America (Herndon, Virginia), India (Bangalore), Asia	117	6.1.1.3.1 SBM-1: Strategy, business model				
		6	2	The Company is a founding member of the IAEG, which is working on development and promotion of common	114-115	6.1.1.2.4 GOV-4: Statement on due				
		7		To support its actions in this respect, the Company is also a member of the Global Business Initiative for Human Rights.	114	6.1.1.2.4 GOV-4: Statement on due				
		8		All suppliers are asked to sign a confirmation of commitment with the principles of the SCoC (or to confirm that their own	195	6.3.3.3 Policies related to value chain workers (S2-				
		9		The results of an SMA, or any sustainability alert, may also lead the Company to request an on-site assessment at a	197	6.3.3.6 Taking action on material impacts on				
		10		The facility, a result of a joint venture between Airbus, Tarmac Aerosave and the City of Chengdu, alongside Satair,	14	Sustainability in Action				
		14								
Micro	Sustainability capabilities	1		The Company invests in lifecycle assessments (LCA) for environmental impact accounting associated with a specific	140	6.2.1 Policies		Airbus' high5+ programme aims to reduce the Company's environmental	5	1.1 Overview
		2		In addition, the Company is deploying frameworks enabling design choices to reduce the footprint of operations, projects	140	6.2.1 Policies		2024: "DNSH Transition to a circular economy. The Company assessed the	172	6.2.7.2 Regulatory disclosure
		3		For resource use- and circular economy-related matters, the Company used the results of Life Cycle Assessment (LCA)	125	6.1.1.4.1 IRO-1: Description of the		During the reporting period, the following sustainability matters structured across the ESRS were addressed by at	110	6.1.1.2.2 GOV-2: Information provided to
		4		Based on this, a regularly updated watchlist of the most critical raw materials has been defined to influence design	168	6.2.6.3.1 Actions and resources (E5-2)		For resource use- and circular economy-related matters, the Company used the results of Life Cycle Assessment (LCA)	125	6.1.1.4.1 IRO-1: Description of the
		5		Despite the absence of measurable targets, the Company tracks the effectiveness of its policies and actions in relation	168	6.2.6.3.2 Targets (E5-3)		Since 2018, the Procurement team has carried out annual proactive sustainability inherent risk mapping.	209	6.4.1.5 Management of relationships with
		6		Digitalisation is leveraged as an enabler to optimise and reduce the environmental footprint, exemplified by the	168-169	6.2.6.4.1 Actions and resources (E5-2)		Before engaging with any supplier, the Company conducts due diligence that covers enforcement, sanctions, adverse	209	6.4.1.5 Management of relationships with
		7		Over the past years and including in 2024, the Company has focused on metering and on data robustness and accuracy	168	6.2.6.4.1 Actions and resources (E5-2)				
		8	2	The Company is deploying digital tools to facilitate the collection, management and use of substance-related data	161	6.2.3.2.2 Actions and resources (E2-2)				
		9		The Company also focuses on preventing supply chain disruption caused by the unavailability of substances.	161	6.2.3.2.2 Actions and resources (E2-2)				
		10		Compliance with applicable environmental regulations and maintaining the ISO 14001:2015 Certified Environmental	140	6.2.1 Policies				
		11		The SCoC also formally requires suppliers to comply with applicable laws and regulations on conflict minerals, including	195	6.3.3.3 Policies related to value chain workers (S2-				
		12		The use of secondary materials in the titanium production	14	Sustainability in Action				

9.2.3 Appendix 11: Application of the Coding Framework – BASF SE

CRM Coding Sheet — BASF SE

			2024					2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	e
Macro	Coercive pressure response	1	2	We are also seeing an expansion of the regulatory framework affecting us and our suppliers (for example,	100	Procurement and supply chain	2	We have implemented the EU's Conflict Minerals Regulation, for example by carrying out a compliance	217	Mineral raw materials
		2		We have implemented the EU's Conflict Minerals Regulation, for example by carrying out a compliance	299	Mineral raw materials		We are also seeing an expansion of the regulatory framework affecting us and our suppliers (for example,	103	Procurement and supply chain
		3		The GBA rules were used in two pilot projects in 2024 and should be ready from 2025 onwards for the future	300	Mineral raw materials				
		4		The chemical industry is facing substantial risks due to changes to and reforms of regulatory requirements or	208	Environmental protection in our				
		5		Political regulations designed to mitigate climate change, such as those set out in the EU Green Deal,	176	Results of the double materiality assessment				
		10								
Macro	Mimetic pressure response	1	1	In addition, we are benchmarking our performance even more closely against that of our competitors.	28	Steering concept of the BASF Group	1	We are involved in various initiatives to drive transparency, harmonization and standardization across	189	Our Product Carbon Footprints
		2		Supplier assessment is mainly performed as part of the chemical industry's Together for Sustainability initiative	225	Water protection in the value chain				
		10								
Macro	Normative pressure response	1	2	A total of 24% of the renewable raw materials purchased by us in 2024 were certified, for example by	254	Resource inflows	2	We have organized our cobalt supply chain according to established sustainability requirements such as the	271	Mineral raw materials
		2		Stakeholder expectations are continuously incorporated into possible objectives. We ensure this is the case	302	Global targets		We also attach importance to certifications, such as the certificate of the London Bullion Market Association	271	Mineral raw materials
		3		Our engagement in multistakeholder and other initiatives represents a key component of our strategic	310	Material impacts of BASF on affected		As part of the requirement, we are committed to the U.N. Guiding Principles on Business and Human Rights,	266	Strategy and governance
		4		Supplier assessment is mainly performed as part of the chemical industry's Together for Sustainability initiative	225	Water protection in the value chain		Our diverse commitments include the Chemie³ industry standard for more sustainable value creation, the Cobalt	159	Interests and Views of our Stakeholders
		5		At the same time, we are involved in various initiatives to drive transparency, harmonization and	194	Product Carbon Footprints		Supplier evaluation is mainly performed as part of the TfS initiative, of which BASF is a founding member. TfS	269	Evaluating and developing our
		6		We also attach importance to certification, such as the LBMA certificate for gold, the LPPM certificate for metals	299	Mineral raw materials		In addition, our Platinum Group Metals catalyst recycling business, which processes secondary Platinum,	272	Mineral raw materials
		7		In addition, we place importance on certifications such as the LBMA certificate3 for gold, the LPPM certificate4	307	Material impacts of BASF on affected		As an acknowledged reporting framework in accordance with section 289d, we are voluntarily applying the	8	Content and Strucutre
		8		It acts as an nonpartisan platform to develop widely accepted rules for comprehensive and standardized	300	Mineral raw materials		Also relevant in the context of battery materials is the Global Battery Alliance (GBA), which was cofounded by	272	Mineral raw materials
		10								

CRM Coding Sheet — BASF SE

			2024					2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	e
Meso	Material criticality	1	2	BASF's most important raw materials (based on volume) include gas and crude oil-based	253	Resource inflows	2	Raw materials-related emissions from battery materials are initially excluded from the target. Battery materials	190	Global targets
		2		Market opportunities in ambitious climate policy scenarios include, for example, alternative surface	98	Long-term demand development		These include cobalt, a key component in the production of battery materials.	271	Mineral raw materials
		3		When using fossil and renewable raw materials, we consider economic criteria, supply security, process	253	Resource inflows		The independent BASF Environmental Catalyst and Metal Solutions (ECMS) division offers customers	239	Resource inflows
		4		Battery materials make a significant contribution to reducing CO2 emissions and thus facilitate the	196	Global Targets				
		5		To replace fossil raw materials, we signed a long-term purchase contract for certified biomethane with ENGIE	193	Actions along our value chain				
		10								
Meso	Supply concentration	1	1	A further escalation of current geopolitical conflicts could lead to disruptions in global supply chains and	87	Overall assessment	1	Another example is our effort with regard to lithium sourcing. Together with BMW, Mercedes-Benz,	217	Actions in the value chain
		2		The Asia Pacific region and China in particular, which already has a significant influence on the growth of the	33	Material Investments and Portfolio		BASF's sourcing of raw materials is diversified geographically (e.g., Europe and Asia Pacific), through	223	Strategy and governance
		3		To counter these risks, BASF relies on comprehensive risk assessment and control along the entire supply	94	Procurement and Supply Chain		A further escalation of current geopolitical conflicts could lead to disruptions in global supply chains and	90	Overall assessment
		4		Supply security for raw materials, energy and services is increasingly affected by trade disputes, protectionism,	100	Procurement and supply chain		Supply security for raw materials, energy and services is increasingly affected by trade disputes, protectionism,	103	Procurement and supply chain
		5						Our diverse commitments include the Chemie³ industry standard for more sustainable value creation,	159	Interests and Views of our Stakeholders
		6						Operational risks in procurement include disruptions and delays in the delivery of raw materials due to	97	Procurement and supply chain
		10								
Meso	Ecological risk	1	2	Our procurement of plant-based raw materials creates an incentive to cultivate certain plants and expand the	181	Results of the double materiality assessment	2	By sourcing raw materials from extractive processes such as mining, we influence land degradation and	224	Negative impact: Land use through the
		2		The manufacture and use of renewable energy requires minerals and metals whose mining and subsequent	170	Results of the double materiality assessment		Sourcing minerals or renewable raw materials from countries with little state control may be associated	169	Results of the double materiality assessment
		3		With this in mind, the German Agency for International Cooperation (GIZ) was commissioned with organizing	226	Actions along the value chain		Impact on land degradation due to the sourcing of raw materials. By sourcing raw materials, we provide	167	Results of the double materiality assessment
		4		We are committed to active dialog with affected communities. Take the sourcing of lithium, for	313	Actions to respect the right of Indigeneous		Our business activities – especially in the sourcing of raw materials – could lead to changes in land use,	169	Results of the double materiality assessment
		10								
Meso	Power gap	1	1	Potential noncompliance by our suppliers may lead to a reduced supplier base.	100	Procurement and supply chain	1	Some of BASF's divisions are exposed to strong fluctuations in raw materials prices. These result	394	Market risks
		2		Following a detailed review, BASF decided not to implement a nickel-cobalt refinery project in Weda Bay,	310	Contribution to the postive development		The divisions ECMS as well as Battery Materials enter into both short-term and long-term purchase	394	Market risks
		3						Supply security for raw materials, energy and services is increasingly affected by trade disputes, protectionism,	103	Procurement and supply
		4						As a result of geopolitical conflicts, increased intra-year volatility in natural gas and raw material prices is	359	14.1 Explanation of intangible assets
		5						Additional financial risks are related to efficiency measures that may not be effective as planned. Other	100	Other financial opportunities and
		10								

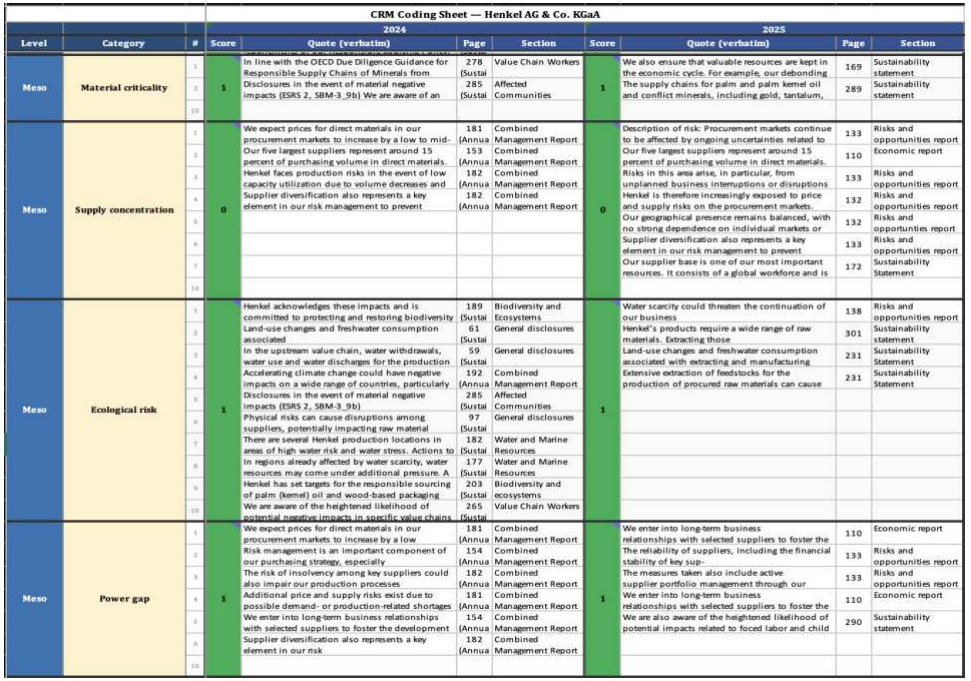
CRM Coding Sheet — BASF SE

			2024				2025											
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	e								
Micro	Technological capabilities	1	2	Intelligently linking and steering our plants and processes as set out in this concept creates efficient	248	Use of fossil raw materials	2	Another focus is on the recycling of mineral raw materials. For example, our Battery Materials division is	239	Resource inflows								
		2		Surface Technologies Construction of a new prototype plant for battery recycling 2024	35	Overview of material investments		The independent BASF Environmental Catalyst and Metal Solutions (ECMS) division offers customers	239	Resource inflows								
		3		In addition, for example, we continue to deploy the mass balance approach in our production in the long	250	Sourcing and the use of raw materials		Corporate funding is used to finance Group Research projects that are of strategic relevance to the BASF	41	Innovation								
		4		One focal point of our activities in the area of circular feedstocks is the chemical recycling of plastics. We use	250	Sourcing and the use of raw materials												
		5		We have many years of experience and a high degree of specialization in recycling precious metals such as	254	Resource inflows												
		6		"Another focus is on recycling mineral raw materials. For example, we are driving forward innovative	254	Resource inflows												
		7		We are constantly working to switch to more sustainable raw materials and to reduce the resources	249	Sourcing and the use of raw materials												
		10																
Micro	Relational capabilities	1	2	Another example is our effort with regard to lithium sourcing. Together with the BMW Group, Mercedes-	226	Actions along the value chain	2	With the start of the third phase in spring 2025, we have committed ourselves to the initiative for another	272	Mineral raw materials								
		2		Together with BMW Group, Samsung SDI Co. Ltd., Samsung Electronics Co. Ltd., Volkswagen AG, Stihl AG	299	Mineral raw materials		Also relevant in the context of battery materials is the Global Battery Alliance (GBA), which was	272	Mineral raw materials								
		3		The Global Battery Alliance (GBA), which was cofounded by BASF in 2017, is also relevant in	300	Mineral raw materials		Together with BMW, Mercedes-Benz, Fairphone, Daimler Truck and Volkswagen, we were involved in the	217	Actions in the value chain								
		4		We cooperate with partners along the value chain, for example in the chemical industry's Together for	246	Resource use and circular economy		Supplier evaluation is mainly performed as part of the TfS initiative, of which BASF is a founding member. TfS	269	Evaluating and developing our								
		5		We are constantly working to switch to more sustainable raw materials and to reduce the resources	249	Sourcing and the use of raw materials		The divisions ECMS as well as Battery Materials enter into both short-term and long-term purchase contracts	394	Market Risks								
		6		"Our engagement in multistakeholder and other initiatives represents a key component of our strategic	306	Material impacts of BASF on affected		Our diverse commitments include the Chemie[3] industry standard for more sustainable value creation,	159	Interests and Views of our Stakeholders								
		7		We are committed to active dialog with affected communities. Take the sourcing of lithium, for	313	Actions with respect the right of Indigenous												
		8		We have relationships with a large number of suppliers of mineral raw materials, which we use to produce	299	Mineral raw materials												
		9		Stakeholder expectations are continuously incorporated into possible objectives. We ensure this is the case	302	Global targets												
		10		Another focus is on recycling mineral raw materials. For example, we are driving forward innovative	254	Resource inflows												
Micro	Sustainability capabilities	1	2	A significant tool for the long-term global steering of the product portfolio based on the sustainability	251	Sourcing and the use of raw materials	2	A significant tool for the long-term global steering of the product portfolio based on the sustainability	236	Steering our product portfolio	Also relevant in	272	Mineral raw materials					
		2		As part of a Group-wide circular economy program, BASF teams have developed new approaches in over 50	249	Actions		Our Procurement organization has set out requirements for our upstream value chain in a global,	225	Policies regarding the sourcing of renewable	A central database	202	Responsible Care Manamgement System					
		3		We define Loop Solutions as products that are categorized as Pioneers or Contributors in line with	252	Global targets		In the medium to long term, we expect increasing demand from our customers for more sustainable	101	Development of competitive and	Loop Solutions	34	More sustainable products					
		4		Stakeholder expectations are continuously incorporated into possible objectives. We ensure this is the case	302	Global targets		Raw materials-related emissions from battery materials are initially excluded from the target. Battery materials	190	Global targets	By sourcing	224	Negative impact: Land use through the sourcing of raw materiaks					
		5		We use a digital solution that continuously determines the PCFs for more than 40,000 sales products16 (see	188	Transition plan for climate change		We help to close and extend loops by developing and implementing circular solutions for the materials that	235	Actions	As part of our	235	Actions					
		6		Where necessary, we use the format of an ESG Council as an instrument for case-by-case engagement with	310	Contribution to the positive development		We have implemented the EU's Conflict Minerals Regulation, for example by carrying out a compliance	271	Mineral raw materials	Required raw	190	Scope 3.1					
		7		We are committed to active dialog with affected communities. Take the sourcing of lithium, for	313	Actions with respect the right of Indigenous		Furthermore, BASF is committed to responsible and sustainable global supply chains for other mineral raw	271	Mineral raw materials	We are also	182	Responsibility in our value chain					
		8		We have relationships with a large number of suppliers of mineral raw materials, which we use to produce	299	Mineral raw materials		We also attach importance to certifications, such as the certificate of the London Bullion Market	271	Mineral raw materials								
		9						In addition, we have established a requirement for the responsible sourcing of battery materials for the	266	Strategy and governance								
		10						We have also established dedicated processes for the sourcing of mineral raw materials to trace their origin	283	Actions to prevent land-related impacts in								

9.2.4 Appendix 12: Application of the Coding Framework – Henkel AG & Co. KGaA

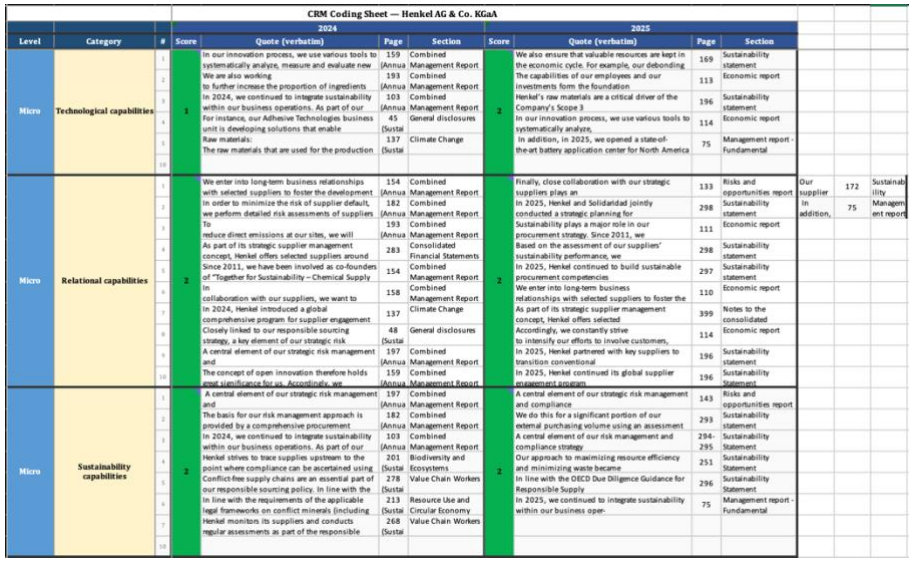
CRM Coding Sheet — Henkel AG & Co. KGaA

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1	2	This year's Sustainability Report marks the next step for this continuous process because it	4	Foreword	2	Conflict-free supply chains are an essential part of our Responsible Sourcing Policy. In line with the	296	Sustainability Statement
		2		As a corporation with global operations, we are particularly exposed to various environmental	194	Legal and regulatory risks		The Sustainability Committee also supported the preparation of the sustainability report aligned to	16	The Company (Report of the
		3		Henkel is also committed to zero net deforestation and has an ambition of deforestation- and	198	Biodiversity and Ecosystems		Potential impacts were identified based on publicly available information and insights from	302	Management report - Sustainability
		4		In line with the requirements of the applicable legal frameworks on conflict minerals (including	213	Resource Use and Circular Economy		Our business is subject to various national rules and regulations and – within the EU – increasingly	141	Risks and opportunities report
		5		In 2024, we focused in particular on the opportunities and risks arising from the double	176	Combined Management Report				
		6		Given the importance of ESG issues for the Company, the Supervisory Board has established a	19	Committee activities				
		7		The EU Taxonomy is a central instrument of the European Union's "Green Deal." The aim of this EU-	117	General disclosures				
		8		We also publish a policy statement on the German Supply Chain Due Diligence Act, which outlines	287	Affected Communities				
		9		Policymakers and authorities require us to comply with legal regulations; beyond that, we give access	51	General disclosures				
		10								
Macro	Mimetic pressure response	1	1	Since 2011, we have been involved as co-founders of "Together for Sustainability – Chemical Supply	154	Combined Management Report	1	Through our involvement in the initiative "Together for Sustainability – Chemical Supply	289	Sustainability Statement
		2		We expect our suppliers to comply with the requirements of our Responsible Sourcing Policy.	263	Value Chain Workers		We do this for a significant portion of our external purchasing volume using an assessment	293	Sustainability statement
		3		Through our involvement in the initiative "Together for Sustainability – Chemical Supply	263	Value Chain Workers		Henkel is also a member of "AIM-Progress," a forum of consumer goods companies. It aims to	297	Sustainability statement
		4		The Together for Sustainability (TfS) initiative plays a central role here. As a large number of TfS	278	Value Chain Workers		In line with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from	296	Sustainability statement
		5		We actively participate in industry initiatives and the development of standards to assess supplier	266	Value Chain Workers				
		6		We continue to follow best practice on Environmental, Social and Governance (ESG)	43	General disclosures				
		7		This year's Sustainability Report marks the next step for this continuous process because it	4	Foreword				
		8		Henkel is also committed to zero net deforestation and has an ambition of deforestation- and	198	Biodiversity and Ecosystems				
		9		In line with the requirements of the applicable legal frameworks on conflict minerals (including	213	Resource Use and Circular Economy				
		10		Our customers expect their suppliers – and that includes Henkel – to ensure compliance with	165	Combined Management Report				
Macro	Normative pressure response	1	2	Our customers expect their suppliers – and that includes Henkel – to ensure compliance with	165	Combined Management Report	2	In line with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from	296	Sustainability statement
		2		We expect our suppliers and other business partners to comply with the principles set out here	268	Value Chain Workers		In both business units, the importance of sustainability topics in our relationships with	168	Sustainability statement
		3		Our implementation of due diligence obligations is guided by the UN Guiding Principles on	39	General disclosures		In this context, Henkel's suppliers worldwide are required to comply with the cross-industry Code	291	Sustainability statement
		4		The OECD Guidelines for Responsible Business Conduct serve as a benchmark for our due	287	Affected Communities		Through our involvement in the initiative "Together for Sustainability – Chemical Supply	289	Sustainability statement
		5		In line with the requirements of the applicable legal frameworks on conflict minerals (including	213	Resource Use and Circular Economy		We do this for a significant portion of our external purchasing volume using an assessment	293	Sustainability statement
		6		In addition to our customers, partners and consumers, who are increasingly interested in	46	General disclosures		Henkel is also a member of "AIM-Progress," a forum of consumer goods companies. It aims to	297	Sustainability statement
		7		Policymakers and authorities require us to comply with legal regulations; beyond that, we give access	51	General disclosures				
		8		Given the importance of ESG issues for the Company, the Supervisory Board has established a	19	Committee activities				
		9		Since 2011, we have been involved as co-founders of "Together for Sustainability – Chemical Supply	154	Combined Management Report				
		10		We expect our suppliers to comply with the requirements of our Responsible Sourcing Policy.	263	Value Chain Workers				



CRM Coding Sheet — Henkel AG & Co. KGaA

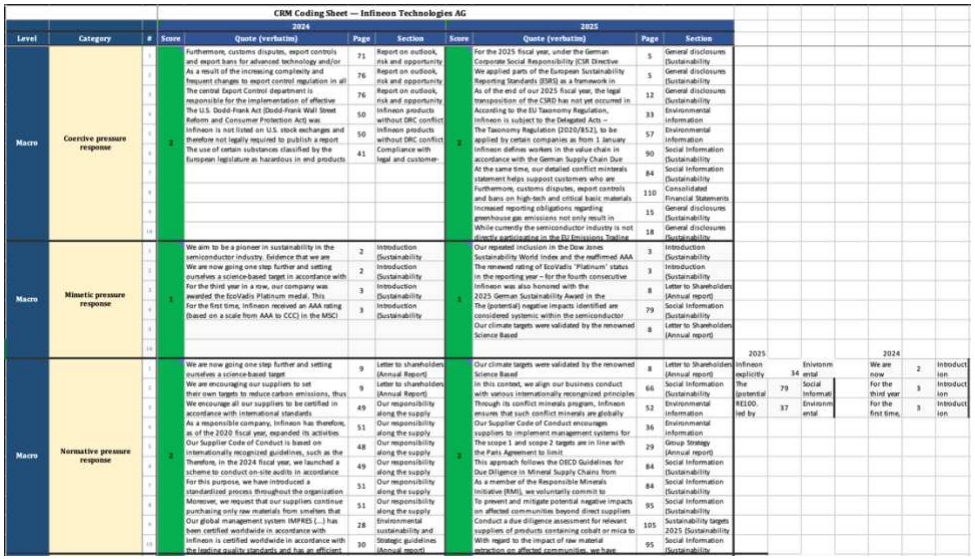
			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1	1	In line with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from	278	Value Chain Workers	1	We also ensure that valuable resources are kept in the economic cycle. For example, our debonding	169	Sustainability statement
		2		Disclosures in the event of material negative impacts (ESRS 2, SBM-3_9b) We are aware of an	285	Affected Communities		The supply chains for palm and palm kernel oil and conflict minerals, including gold, tantalum,	289	Sustainability statement
		10								
Meso	Supply concentration	1	0	We expect prices for direct materials in our procurement markets to increase by a low to mid-	181	Combined Management Report	0	Description of risk: Procurement markets continue to be affected by ongoing uncertainties related to	133	Risks and opportunities report
		2		Our five largest suppliers represent around 15 percent of purchasing volume in direct materials.	153	Combined Management Report		Our five largest suppliers represent around 15 percent of purchasing volume in direct materials.	110	Economic report
		3		Henkel faces production risks in the event of low capacity utilization due to volume decreases and	182	Combined Management Report		Risks in this area arise, in particular, from unplanned business interruptions or disruptions	133	Risks and opportunities report
		4		Supplier diversification also represents a key element in our risk management to prevent	182	Combined Management Report		Henkel is therefore increasingly exposed to price and supply risks on the procurement markets.	132	Risks and opportunities report
		5						Our geographical presence remains balanced, with no strong dependence on individual markets or	132	Risks and opportunities report
		6						Supplier diversification also represents a key element in our risk management to prevent	133	Risks and opportunities report
		7						Our supplier base is one of our most important resources. It consists of a global workforce and is	172	Sustainability Statement
		10								
Meso	Ecological risk	1	1	Henkel acknowledges these impacts and is committed to protecting and restoring biodiversity	189	Biodiversity and Ecosystems	1	Water scarcity could threaten the continuation of our business	138	Risks and opportunities report
		2		Land-use changes and freshwater consumption associated	61	General disclosures		Henkel's products require a wide range of raw materials. Extracting those	301	Sustainability statement
		3		In the upstream value chain, water withdrawals, water use and water discharges for the production	59	General disclosures		Land-use changes and freshwater consumption associated with extracting and manufacturing	231	Sustainability Statement
		4		Accelerating climate change could have negative impacts on a wide range of countries, particularly	192	Combined Management Report		Extensive extraction of feedstocks for the production of procured raw materials can cause	231	Sustainability Statement
		5		Disclosures in the event of material negative impacts (ESRS 2, SBM-3_9b)	285	Affected Communities				
		6		Physical risks can cause disruptions among suppliers, potentially impacting raw material	97	General disclosures				
		7		There are several Henkel production locations in areas of high water risk and water stress. Actions to	182	Water and Marine Resources				
		8		In regions already affected by water scarcity, water resources may come under additional pressure. A	177	Water and Marine Resources				
		9		Henkel has set targets for the responsible sourcing of palm (kernel) oil and wood-based packaging	203	Biodiversity and ecosystems				
		10		We are aware of the heightened likelihood of potential negative impacts in specific value chains	265	Value Chain Workers				
Meso	Power gap	1	1	We expect prices for direct materials in our procurement markets to increase by a low	181	Combined Management Report	1	We enter into long-term business relationships with selected suppliers to foster the	110	Economic report
		2		Risk management is an important component of our purchasing strategy, especially	154	Combined Management Report		The reliability of suppliers, including the financial stability of key sup-	133	Risks and opportunities report
		3		The risk of insolvency among key suppliers could also impair our production processes	182	Combined Management Report		The measures taken also include active supplier portfolio management through our	133	Risks and opportunities report
		4		Additional price and supply risks exist due to possible demand- or production-related shortages	181	Combined Management Report		We enter into long-term business relationships with selected suppliers to foster the	110	Economic report
		5		We enter into long-term business relationships with selected suppliers to foster the development	154	Combined Management Report		We are also aware of the heightened likelihood of potential impacts related to foced labor and child	290	Sustainability statement
		6		Supplier diversification also represents a key element in our risk	182	Combined Management Report				



CRM Coding Sheet — Henkel AG & Co. KGaA

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Micro	Technological capabilities	1	1	In our innovation process, we use various tools to systematically analyze, measure and evaluate new	159	Combined Management Report	2	We also ensure that valuable resources are kept in the economic cycle. For example, our debonding	169	Sustainability statement
		2		We are also working to further increase the proportion of ingredients	193	Combined Management Report		The capabilities of our employees and our investments form the foundation	113	Economic report
		3		In 2024, we continued to integrate sustainability within our business operations. As part of our	103	Combined Management Report		Henkel's raw materials are a critical driver of the Company's Scope 3	196	Sustainability statement
		4		For instance, our Adhesive Technologies business unit is developing solutions that enable	45	General disclosures		In our innovation process, we use various tools to systematically analyze,	114	Economic report
		5		Raw materials: The raw materials that are used for the production	137	Climate Change		In addition, in 2025, we opened a state-of-the-art battery application center for North America	75	Management report - Fundamental
		10								
Micro	Relational capabilities	1	2	We enter into long-term business relationships with selected suppliers to foster the development	154	Combined Management Report	2	Finally, close collaboration with our strategic suppliers plays an	133	Risks and opportunities report
		2		In order to minimize the risk of supplier default, we perform detailed risk assessments of suppliers	182	Combined Management Report		In 2025, Henkel and Solidaridad jointly conducted a strategic planning for	298	Sustainability statement
		3		To reduce direct emissions at our sites, we will	193	Combined Management Report		Sustainability plays a major role in our procurement strategy. Since 2011, we	111	Economic report
		4		As part of its strategic supplier management concept, Henkel offers selected suppliers around	283	Consolidated Financial Statements		Based on the assessment of our suppliers' sustainability performance, we	298	Sustainability statement
		5		Since 2011, we have been involved as co-founders of "Together for Sustainability – Chemical Supply	154	Combined Management Report		In 2025, Henkel continued to build sustainable procurement competencies	297	Sustainability statement
		6		In collaboration with our suppliers, we want to	158	Combined Management Report		We enter into long-term business relationships with selected suppliers to foster the	110	Economic report
		7		In 2024, Henkel introduced a global comprehensive program for supplier engagement	137	Climate Change		As part of its strategic supplier management concept, Henkel offers selected	399	Notes to the consolidated
		8		Closely linked to our responsible sourcing strategy, a key element of our strategic risk	48	General disclosures		Accordingly, we constantly strive to intensify our efforts to involve customers,	114	Economic report
		9		A central element of our strategic risk management and	197	Combined Management Report		In 2025, Henkel partnered with key suppliers to transition conventional	196	Sustainability statement
		10		The concept of open innovation therefore holds great significance for us. Accordingly, we	159	Combined Management Report		In 2025, Henkel continued its global supplier engagement program	196	Sustainability Statement
Micro	Sustainability capabilities	1	2	A central element of our strategic risk management and	197	Combined Management Report	2	A central element of our strategic risk management and compliance	143	Risks and opportunities report
		2		The basis for our risk management approach is provided by a comprehensive procurement	182	Combined Management Report		We do this for a significant portion of our external purchasing volume using an assessment	293	Sustainability statement
		3		In 2024, we continued to integrate sustainability within our business operations. As part of our	103	Combined Management Report		A central element of our risk management and compliance strategy	294-295	Sustainability Statement
		4		Henkel strives to trace supplies upstream to the point where compliance can be ascertained using	201	Biodiversity and Ecosystems		Our approach to maximizing resource efficiency and minimizing waste became	251	Sustainability Statement
		5		Conflict-free supply chains are an essential part of our responsible sourcing policy. In line with the	278	Value Chain Workers		In line with the OECD Due Diligence Guidance for Responsible Supply	296	Sustainability Statement
		6		In line with the requirements of the applicable legal frameworks on conflict minerals (including	213	Resource Use and Circular Economy		In 2025, we continued to integrate sustainability within our business oper-	75	Management report - Fundamental
		7		Henkel monitors its suppliers and conducts regular assessments as part of the responsible	268	Value Chain Workers				
		10								

9.2.5 Appendix 13: Application of the Coding Framework – Infineon Technologies AG



CRM Coding Sheet — Infineon Technologies AG

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1	2	Furthermore, customs disputes, export controls and export bans for advanced technology and/or	71	Report on outlook, risk and opportunity	2	For the 2025 fiscal year, under the German Corporate Social Responsibility (CSR Directive	5	General disclosures (Sustainability
		2		As a result of the increasing complexity and frequent changes to export control regulation in all	76	Report on outlook, risk and opportunity		We applied parts of the European Sustainability Reporting Standards (ESRS) as a framework in	5	General disclosures (Sustainability
		3		The central Export Control department is responsible for the implementation of effective	76	Report on outlook, risk and opportunity		As of the end of our 2025 fiscal year, the legal transposition of the CSRD has not yet occurred in	12	General disclosures (Sustainability
		4		The U.S. Dodd-Frank Act (Dodd-Frank Wall Street Reform and Consumer Protection Act) was	50	Infineon products without DRC conflict		According to the EU Taxonomy Regulation, Infineon is subject to the Delegated Acts –	33	Environmental information
		5		Infineon is not listed on U.S. stock exchanges and therefore not legally required to publish a report	50	Infineon products without DRC conflict		The Taxonomy Regulation (2020/852), to be applied by certain companies as from 1 January	57	Environmental information
		6		The use of certain substances classified by the European legislature as hazardous in end products	41	Compliance with legal and customer-		Infineon defines workers in the value chain in accordance with the German Supply Chain Due	90	Social Information (Sustainability
		7						At the same time, our detailed conflict minerals statement helps support customers who are	84	Social Information (Sustainability
		8						Furthermore, customs disputes, export controls and bans on high-tech and critical basic materials	110	Consolidated Financial Statements
		9						Increased reporting obligations regarding greenhouse gas emissions not only result in	15	General disclosures (Sustainability
		10						While currently the semiconductor industry is not directly participating in the EU Emissions Trading	18	General disclosures (Sustainability
Macro	Mimetic pressure response	1	1	We aim to be a pioneer in sustainability in the semiconductor industry. Evidence that we are	2	Introduction (Sustainability	1	Our repeated inclusion in the Dow Jones Sustainability World Index and the reaffirmed AAA	3	Introduction (Sustainability
		2		We are now going one step further and setting ourselves a science-based target in accordance with	2	Introduction (Sustainability		The renewed rating of EcoVadis "Platinum" status in the reporting year – for the fourth consecutive	3	Introduction (Sustainability
		3		For the third year in a row, our company was awarded the EcoVadis Platinum medal. This	3	Introduction (Sustainability		Infineon was also honored with the 2025 German Sustainability Award in the	8	Letter to Shareholders (Annual report)
		4		For the first time, Infineon received an AAA rating (based on a scale from AAA to CCC) in the MSCI	3	Introduction (Sustainability		The (potential) negative impacts identified are considered systemic within the semiconductor	79	Social Information (Sustainability
		5						Our climate targets were validated by the renowned Science Based	8	Letter to Shareholders (Annual report)
		6								
		7								
Macro	Normative pressure response	1	2	We are now going one step further and setting ourselves a science-based target	9	Letter to shareholders (Annual Report)	2	Our climate targets were validated by the renowned Science Based	8	Letter to Shareholders (Annual report)
		2		We are encouraging our suppliers to set their own targets to reduce carbon emissions, thus	9	Letter to shareholders (Annual Report)		In this context, we align our business conduct with various internationally recognized principles	66	Social Information (Sustainability
		3		We encourage all our suppliers to be certified in accordance with international standards	49	Our responsibility along the supply		Through its conflict minerals program, Infineon ensures that such conflict minerals are globally	52	Environmental information
		4		As a responsible company, Infineon has therefore, as of the 2020 fiscal year, expanded its activities	51	Our responsibility along the supply		Our Supplier Code of Conduct encourages suppliers to implement management systems for	36	Environmental information
		5		Our Supplier Code of Conduct is based on internationally recognized guidelines, such as the	48	Our responsibility along the supply		The scope 1 and scope 2 targets are in line with the Paris Agreement to limit	29	Group Strategy (Annual report)
		6		Therefore, in the 2024 fiscal year, we launched a scheme to conduct on-site audits in accordance	49	Our responsibility along the supply		This approach follows the OECD Guidelines for Due Diligence in Mineral Supply Chains from	84	Social Information (Sustainability
		7		For this purpose, we have introduced a standardized process throughout the organization	51	Our responsibility along the supply		As a member of the Responsible Minerals Initiative (RMI), we voluntarily commit to	84	Social Information (Sustainability
		8		Moreover, we request that our suppliers continue purchasing only raw materials from smelters that	51	Our responsibility along the supply		To prevent and mitigate potential negative impacts on affected communities beyond direct suppliers	95	Social Information (Sustainability
		9		Our global management system IMPRES (...) has been certified worldwide in accordance with	28	Environmental sustainability and		Conduct a due diligence assessment for relevant suppliers of products containing cobalt or mica to	105	Sustainability targets 2025 (Sustainability
		10		Infineon is certified worldwide in accordance with the leading quality standards and has an efficient	30	Strategic guidelines (Annual report)		With regard to the impact of raw material extraction on affected communities, we have	95	Social Information (Sustainability

CRM Coding Sheet — Infineon Technologies AG

Bearbeitungsleiste

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1	2	We have intensified our activities in this area in recent years through our own organic growth	29	Group strategy (Annual Report)	2	Access to high quality raw materials such as silicon and special chemicals is a critical input factor for	10	General disclosures (Sustainability Report)
		2		Moreover, our dependence on energy supplies for our production, as well as on various	73	Report on outlook, risk and opportunity		We focus on innovative materials such as silicon carbide and gallium nitride.	36	Research and development (Annual
		3		Our core business includes power semiconductors based on silicon, silicon carbide	20	Business Model (Annual Report)		Moreover, our dependence on energy supplies for our production, as well as on various	75	Report on outlook, risk and opportunity
		4		As a technological leader, we want to set the tone across the whole spectrum of power	7	Letter to shareholders (Annual Report)		Materials that remain in the final product include, among others, wafer materials such as silicon and silicon	51	Environmental information
		5		The term 'DRC conflict minerals' applies to tantalum, tin, gold and tungsten, inasmuch as their extraction and/or	50	Sustainability Report		Conflict minerals here refer to the collective group of materials – tin, tantalum, tungsten, and gold. Through	52	Environmental information
		6						Key metrics related to Infineon's materials inflows. We report the following key metrics in relation to our	52	Environmental information
		7						Whereas most power semiconductor components to date have been based on pure	31	Group Strategy (Annual report)
		8						We are also driving forward economies of scale for silicon carbide and gallium nitride.	28	Group Strategy (Annual report)
		9						The first is power semiconductors based on silicon, silicon carbide and gallium nitride	21	Business model (Annual report)
		10						With our shift of silicon carbide manufacturing to 200-	8	Management and Supervisory Board
Meso	Supply concentration	1	2	Infineon has all the important success factors for the silicon carbide business. A glob-	8	Letter to shareholders (Sustainabiltiy Report)	1	Our human rights strategy also encompasses the responsible sourcing of raw materials and minerals,	80	Social Information (Sustainability Report)
		2		This is especially true against the backdrop of the geopolitical risks that continue to	108	Consolidated Financial Statements (Annual		Another component of our due diligence program addresses mica usage. In the two key mica-producing	84	Social Information (Sustainability Report)
		3		Our supply chains and our production are both resilient. Our manufacturing facilities	30	Group strategy (Annual report)		However, due to the complexity of our supply chain and limited industry-wide transparency, especially in the	79	Social Information (Sustainability Report)
		4		The DRC has around 50 percent of global cobalt reserves and produces the largest quantity of cobalt in the world.	51	Our responsibility along the supply chain		The war in Ukraine is giving rise to risks and adverse impacts, such as price increases and a shortage of energy	73	Report on outlook, risk and opportunity
		5		In addition, the conflict over Taiwan may affect the supply situation for	72	Report on outlook, risk and opportunity		In general, we seek to minimize procurement-related risks through our purchasing strategies and the use of	74	Report on outlook, risk and opportunity
		6		Our supply chains and our production are both resilient. Our manufacturing facilities	30	Strategic guidelines (Annual report)		These include electronic gases or silicon-based materials, whose demand is also rising in other high-growth	17	General disclosures (Sustainability Report)
		7		The investment in a production company in - Germany (European Semiconductor Manufacturing	30	Strategic guidelines (Annual report)				
		8		Furthermore, customs disputes, export controls and export bans for advanced tech-	71	Report on outlook, risk and opportunity				
		9		Since Infineon does not source these metals directly from mines or smelters, we identify their origin in close	51	Our responsibility along the supply chain				
		10		In the 2024 fiscal year, Infineon identified potential suppliers of conflict minerals and evaluated them with	51	Our responsibility along the supply chain				

CRM Coding Sheet — Infineon Technologies AG

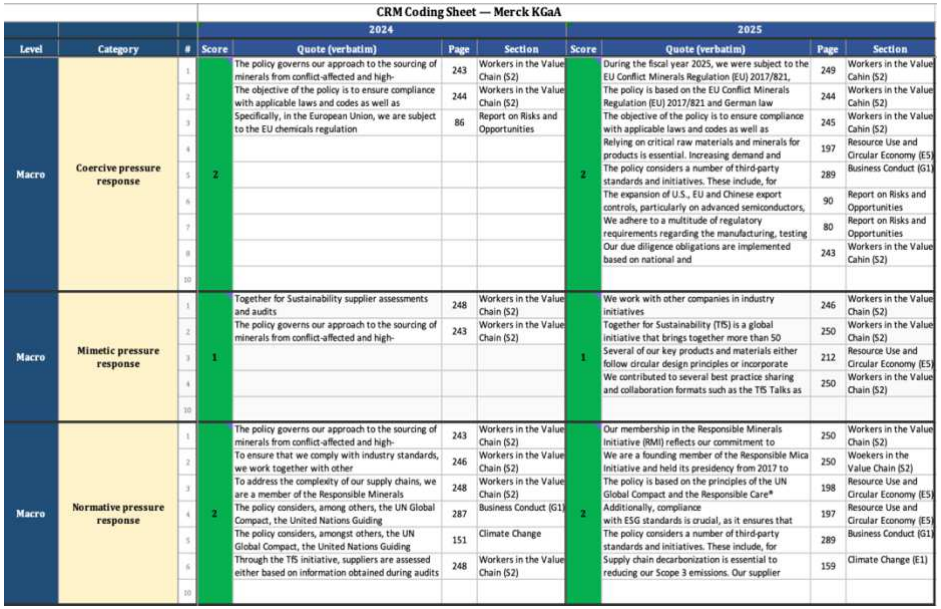
			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Ecological risk	1	1	Infineon has not currently identified any material risks in relation to climate	109	Consilidated Financial Statements (Annual	2	Raw material extraction, in particular, can result in environmental degradation and soil disruption potential	93	Social Information (Sustainability Report)
		2		Serious concerns have been raised in several reports about the social and environmental impact of cobalt	51	Sustainabilty Report		Raw materials such as silicon, gold, and copper are required for semiconductor production. The extraction of	93	Social Information (Sustainability Report)
		3		Physical changes in the climate such as an increased frequency and intensity of extreme weather events	109	Consilidated Financial Statements (Annual		The process of raw material extraction is energy-intensive. Traditional energy sources such as fossil fuels	30	Environmental information
		4		An increasing number of events, such as extreme weather conditions (e.g., floods,	74	Report on outlook, risk and opportunity		Water withdrawal and the resulting consumption in semiconductor manufacturing can put pressure on local	46	Environmental information
		5		Semiconductors enable more efficient use of scarce resources and the exploitation of the full potential of	2	Introduction (Sustainability Report)		Closer examination shows that flooding exceeds the materiality threshold at just 4 out of 25 sites, which	16	General disclosures (Sustainability Report)
		6		In this context, another vital task will be dealing with the limited availability of natural resources to preserve	28	Environmental sustainability and		A key risk driver is raw material procurement. In the 1.5 degree scenario, rising costs are expected for emissions-	17	General disclosures (Sustainability Report)
		7		Climate change is a global challenge. The consequences of changing climate conditions threaten regional	28	Environmental sustainability and		Raw materials such as silicon, gold, and copper are required for semiconductor production. The extraction of	93	Social Information (Sustainability Report)
		8		Based on the assessment of the potential risks of water stress we conducted using the Aqueduct Water Risk	35	Environmental sustainability and		Silicon raw wafer production is energy-intensive. Traditional energy sources have negative impacts on	31	Environmental information
		9		Physical changes in the climate such as an increased frequency and intensity of extreme weather events	198	Consolidated Financial Statements (Annual				
		10								
Meso	Power gap	1	2	We cooperate with numerous suppliers who provide us with materials and services	72	Report on outlook, risk and opportunity	2	Additionally, Infineon is exposed to price risks with respect to raw materials upon which it is dependent.	159	Consolidated Financial Statements (Annual
		2		Additionally, Infineon is exposed to price risks with respect to raw materials upon	157	Consolidated Financial Statements (Annual		To hedge the price risks of highly probable gold purchases in the 2026 fiscal year, Infineon entered into	155	Consolidated Financial Statements (Annual
		3		Moreover, our dependence on energy supplies for our production, as well as on various	73	Report on outlook, risk and opportunity		Moreover, our dependence on energy supplies for our production, as well as on various production materials	75	Report on outlook, risk and opportunity
		4		Customers recognize the competitive advantage offered by our in-house manufacturing by	29	Strategic guidelines (Annual report)		Raw material pricing leads to an increase in the cost of key raw materials, posing the most relevant risk to	15	General disclosures (Sustainability Report)
		5		Furthermore, customs disputes, export controls and export bans for advanced tech-	71	Report on outlook, risk and opportunity		These include electronic gases or silicon-based materials, whose demand is also rising in other high-growth	17	General disclosures (Sustainability Report)
		6		We also oblige our main suppliers conctractually to uphold our environmental, occupational safety and	48	Our responsibility along the supply chain		To ensure our delivery capability, even in times of scarce production capacity in standard technologies, we have	31	Management and Supervisory Board
		7		More than 390 strategic suppliers, representing over 70 percent of the procurement volume, were re-evaluated	49	Our responsibility along the supply chain		In this context, the implementation of measures aimed at optimizing manufacturing costs for raw materials and	75	Report on outlook, risk and opportunity
		8								
		9								
		10								

CRM Coding Sheet — Infineon Technologies AG																			
			2024				2025												
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section									
		10									2025				2024				
Micro	Technological capabilities	1	2	Infineon has all the important success factors for the silicon carbide business. A glob-	8	Letter to shareholders (Annual Report)	2	Our 300-millimeter thin wafer manufacturing technology for power semiconductors is a clear	31	Group Strategy (Annual report)	Infineon explicitly	34	Enivronm ental		A prime example	2	Introduct ion		
		2		As the manufacturing processes for gallium nitride and silicon are very	8	Letter to the shareholder (Annual		In autumn 2024, we were the first company worldwide to announce the rollout of 300-	31	Group Strategy (Annual report)									
		3		Our 300-millimeter thin wafer manufacturing technology for power semiconductors	30	Group strategy (Annual report)		Our voluntary investments in state-of-the-art abatement systems enable us to avoid more than	36	Environmental information									
		4		Infineon seeks to minimize these risks through its procure-	157	Consolidated Financial Statements		In addition, the ongoing transition to our newest 300-millimeter technology and the advancement	36	Environmental information									
		5		The focus here will be on the completion of the fourth manufacturing module in	64	Report on outlook, risk and opportunity		Infineon pursues initiatives to recover precious metals, such as palladium, from this waste	55	Environmental information									
		6		Research and development (R&D) activities therefore concentrate on	34	Research and development		In Kulim, we want to create the most competitive manufacturing facility for silicon carbide	32	Group Strategy (Annual report)									
		7		From a technological perspective, compound semiconductors are of particular	29	Group strategy (Annual report)		One of our main objectives is to increase the efficiency and power density of our	36	Research and development									
		8		In power electronics, this applies not only to silicon but especially to the new semi-	12	Report of the Supervisory Board		Whereas most power semiconductor components to date have been based on pure	31	Group Strategy (Annual report)									
		9		Infineon develops the world's first 300 mm gallium nitride wafer technology for power	7	Sustainability Report		We are also driving forward economies of scale for silicon carbide and gallium nitride.	28	Group Strategy (Annual report)									
		10						With our shift of silicon carbide manufacturing to 200-	8	Letter to Shareholders (Annual report)									
Micro	Relational capabilities	1	2	To ensure our delivery capability, even in times of scarce	30	Group Strategy (Annual Report)	2	We introduced a structured 'Supplier Engagement Program' aligned to each supplier's capability and	37	Environmental information									
		2		The expansion, which was planned in phases depending on the market situation, is	8	Letter to shareholders (Annual Report)		Infineon's procurement team is already actively working together with over 100 suppliers on	29	Group Strategy (Annual report)									
		3		The investment in a production company in - Germany (European Semiconductor	30	Group Strategy (Annual Report)		To ensure our delivery capability, even in times of scarce production capacity in standard	31	Group Strategy (Annual report)									
		4		To ensure our delivery capability, even in times of scarce	30	Group strategy (Annual Report)		Joint ventures: SAIC Infineon Automotive Power Modules (Shanghai) Co., Ltd	171	Consolidated Financial Statements									
		5		A long-term partnership between Infineon and ist suppliers is a core element of our corporate	48	Our responsibility along the supply		In October 2025, a Supplier Sustainability Summit was held with direct suppliers, where best	105	Sustainability targets 2025 (Sustainability									
		6		We also oblige our main suppliers contractually to uphold our environmental, occupational safety	48	Our responsibility along the supply		In general, we seek to minimize procurement-related risks through our purchasing strategies and	74	Report on outlook, risk and opportunity									
		7		By working together with IntegrityNext and RBA, we also play an active role in industry	49	Our responsibility along the supply													
		8		In general, we seek to minimize procurement-related risks through our purchasing	72	Report on outlook, risk and opportunity													
		9		Infineon has all the important success factors for the silicon carbide business. A glob-	8	Letter to shareholders (Annual Report)													
		10																	
Micro	Sustainability capabilities	1	2	For this purpose, we have introduced a standardized process throughout the organization	51	Our responsibility along the supply	2	Within our conflict minerals program, we apply a standardized process to establish supply chain	84	Social Information (Sustainability									
		2		In the 2024 fiscal year, Infineon identified potential suppliers of conflict minerals and	51	Our responsibility along the supply		We have also integrated cobalt into our due diligence program for responsible raw material and	84	Social Information (Sustainability									
		3		Our targets and requirements for our supply chain are set forth in the Infineon Conflict Minerals	51	Our responsibility along the supply		In addition to our existing focus on conflict minerals, cobal, and mica under our conflict	83	Social Information (Sustainability									
		4		As a responsible company, Infineon has therefore, as of the 2020 fiscal year, expanded its activities	51	Our responsibility along the supply		To this end, we have conducted an initial comprehensive raw material risk assessment,	84	Social Information (Sustainability									
		5		In addition to the evaluations carried out in the central supplier management portal, a risk-based	49	Our responsibility along the supply		We monitor the status and progress of our suppliers against major climate-related metrics	38	Environmental information									
		6		Therefore, in the 2024 fiscal year, we launched a scheme to conduct on-site audits in accordance	49	Our responsibility along the supply		A centralized tool is used at all sites to consolidate this information at the corporate level.	55	Environmental information									
		7		In December 2023, Infineon committed itself to setting a science-based target (SBT) in relation to	29	Environmental sustainability and		To achieve this, we have deployed a group-wide framework to ensure transparency across our	35	Environmental information									
		8		Nevertheless, as a member of the Responsible Minerals Initiative, we uphold our voluntary	50	Our responsibility along the supply		Our human rights risk management system covers not only direct suppliers (Tier 1) but also includes	83	Social Information (Sustainability									
		9		Furthermore, we work closely with suppliers on projects relating to the circular economy,	50	Our responsibility along the supply		To prevent and mitigate potential negative impacts on affected communities beyond direct suppliers	95	Social Information (Sustainability									
		10						Silicon sludges are produced during wafer slicing, polishing, and other silicon-based manufacturing	55	Environmental information									

9.2.6 Appendix 14: Application of the Coding Framework – Merck KGaA

CRM Coding Sheet — Merck KGaA

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1		We use critical raw materials and minerals extracted for the manufacture of various products.	196	Resource Use and Circular Economy (E5)		Relying on critical raw materials and minerals for products is essential. Increasing demand and	197	Resource Use and Circular Economy (E5)
		2		Our dependence on suppliers of certain critical raw materials can lead to increased competition, rising	196	Resource Use and Circular Economy (E5)		Reliance on suppliers for critical raw materials can lead to potential supply chain disruptions, which	197	Resource Use and Circular Economy (E5)
		3		Chemicals includes, for example: organic fine chemicals such as phosphorus, boron and sulfur	206	Resource Use and Circular Economy (E5)		We are committed to enhancing our offerings by developing cutting-edge material solutions,	49	Research and Development
		4		For example, mica is an important raw material for our effect pigments, which are used in the	240	Workers in the Value Chain (S2)		One of the chemical compounds playing a major role for advanced memory and logic chips is	50	Research and Development
		5	2	We are committed to enhancing our offerings by developing cutting-edge material solutions,	46	Research and Development	2	In Planarization, several of our back-end-of-line products have entered advanced stages of	49	Research and Development
		6						The policy governs our approach to the sourcing of minerals from conflict-affected and high-	244	Workers in the Value Chain (S2)
		7						Structural growth is supported by the increasing adoption of AI and the	92	Report on Risks and Opportunities
		10								
Meso	Supply concentration	1		We use critical raw materials and minerals extracted for the manufacture of various products.	196	Resource Use and Circular Economy (E5)		Our human rights and environmental due diligence program prioritizes	249	Workers in the Value Chain (S2)
		2		We source numerous raw materials, packaging materials, technical products, components,	238	Workers in the Value Chain (S2)		Our company operates in complex supply chains, often involving several supplier levels between us	240	Workers in the Value Chain (S2)
		9	2	The EU's 2024-2025 work program, the U.S. administration's	86	Report on Risks and Opportunities	1	The net risks of negative geopolitical and macroeconomic developments are considered	90	Report on Risks and Opportunities
		4						We source numerous raw materials, packaging materials, technical products,	240	Workers in the Value Chain (S2)
		10								
Meso	Ecological risk	1		We use critical raw materials and minerals extracted for the manufacture of various products.	196	Resource Use and Circular Economy (E5)		Increasing demand and environmental degradation heighten the risk of	197	Resource Use and Circular Economy (E5)
		2		Our dependence on suppliers of certain critical raw materials can lead to increased competition, rising	196	Resource Use and Circular Economy (E5)		Furthermore, the risk of natural disasters poses a significant threat, as such events	197	Resource Use and Circular Economy (E5)
		3		Due to the nature of our business activities, for example when sourcing mica, negative impacts on	239	Workers in the Value Chain (S2)		In 2025, we successfully navigated a complex landscape of challenges, including ongoing	95	Report on Risks and Opportunities
		4	2	The sourcing of materials that could lead to the loss of biodiversity (e.g., genetic diversity,	193	Biodiversity and Ecosystems	1	Workers who extract, process and transport conflict minerals such as tin, tungsten, tantalum,	240	Workers in the Value Chain (S2)
		5						Similarly, as for the 3TG, there is a considerable risk of child labor, discrimination,	240	Workers in the Value Cahin (S2)
		10								
Meso	Power gap	1		Our dependence on suppliers of certain critical raw materials can lead to increased competition, rising	196	Resource Use and Circular Economy (E5)		Economic nationalism and the drive for greater supply chain localization are reshaping	90	Report on Risks and Opportunities
		2		We source numerous raw materials, packaging materials, technical products, components,	238	Workers in the Value Chain (S2)		Despite signs of market recovery, excess market capacities persist	91	Report on Risks and Opportunities
		3						The ongoing war between Russia and Ukraine continues to influence energy markets and supply	89	Report on Risks and Opportunities
		4	1				1	We acknowledge that certain vulnerabilities persist and are therefore committed to investing in	96	Report on Risks and Opportunities
		5						We are expanding our dual sourcing strategies, strengthening strategic inventories and	90	Report on Risks and Opportunities
		6						Furthermore, there are risks of supply bottlenecks due	95	Report on Risks and Opportunities
		7						In accordance with applicable laws, strict sourcing and material	197	Resource Use and Circular Economy (E5)
		10								



CRM Coding Sheet — Merck KGaA

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1		The policy governs our approach to the sourcing of minerals from conflict-affected and high-	243	Workers in the Value Chain (S2)		During the fiscal year 2025, we were subject to the EU Conflict Minerals Regulation (EU) 2017/821,	249	Workers in the Value Cahin (S2)
		2		The objective of the policy is to ensure compliance with applicable laws and codes as well as	244	Workers in the Value Chain (S2)		The policy is based on the EU Conflict Minerals Regulation (EU) 2017/821 and German law	244	Workers in the Value Cahin (S2)
		3		Specifically, in the European Union, we are subject to the EU chemicals regulation	86	Report on Risks and Opportunities		The objective of the policy is to ensure compliance with applicable laws and codes as well as	245	Workers in the Value Cahin (S2)
		4						Relying on critical raw materials and minerals for products is essential. Increasing demand and	197	Resource Use and Circular Economy (E5)
		5	2				2	The policy considers a number of third-party standards and initiatives. These include, for	289	Business Conduct (G1)
		6						The expansion of U.S., EU and Chinese export controls, particularly on advanced semiconductors,	90	Report on Risks and Opportunities
		7						We adhere to a multitude of regulatory requirements regarding the manufacturing, testing	80	Report on Risks and Opportunities
		8						Our due diligence obligations are implemented based on national and	243	Workers in the Value Cahin (S2)
		10								
Macro	Mimetic pressure response	1		Together for Sustainability supplier assessments and audits	248	Workers in the Value Chain (S2)		We work with other companies in industry initiatives	246	Workers in the Value Chain (S2)
		2		The policy governs our approach to the sourcing of minerals from conflict-affected and high-	243	Workers in the Value Chain (S2)		Together for Sustainability (TfS) is a global initiative that brings together more than 50	250	Workers in the Value Chain (S2)
		3	1				1	Several of our key products and materials either follow circular design principles or incorporate	212	Resource Use and Circular Economy (E5)
		4						We contributed to several best practice sharing and collaboration formats such as the TfS Talks as	250	Workers in the Value Chain (S2)
		10								
Macro	Normative pressure response	1		The policy governs our approach to the sourcing of minerals from conflict-affected and high-	243	Workers in the Value Chain (S2)		Our membership in the Responsible Minerals Initiative (RMI) reflects our commitment to	250	Workers in the Value Chain (S2)
		2		To ensure that we comply with industry standards, we work together with other	246	Workers in the Value Chain (S2)		We are a founding member of the Responsible Mica Initiative and held its presidency from 2017 to	250	Woekers in the Value Chain (S2)
		3		To address the complexity of our supply chains, we are a member of the Responsible Minerals	248	Workers in the Value Chain (S2)		The policy is based on the principles of the UN Global Compact and the Responsible Care®	198	Resource Use and Circular Economy (E5)
		4	2	The policy considers, among others, the UN Global Compact, the United Nations Guiding	287	Business Conduct (G1)	2	Additionally, compliance with ESG standards is crucial, as it ensures that	197	Resource Use and Circular Economy (E5)
		5		The policy considers, amongst others, the UN Global Compact, the United Nations Guiding	151	Climate Change		The policy considers a number of third-party standards and initiatives. These include, for	289	Business Conduct (G1)
		6		Through the TfS initiative, suppliers are assessed either based on information obtained during audits	248	Workers in the Value Chain (S2)		Supply chain decarbonization is essential to reducing our Scope 3 emissions. Our supplier	159	Climate Change (E1)
		10								

CRM Coding Sheet — Merck KGaA										
			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Micro	Technological capabilities	1	2	We want to make research and production as environmentally friendly as possible and have	200	Resource Use and Circular Economy (E5)	2	One of the chemical compounds playing a major role for advanced memory and logic chips is	50	Research and development
		2		The affected stakeholder groups of GreenSpeed include employees, customers, suppliers, and	200	Resource Use and Circular Economy (E5)		We are committed to enhancing our offerings by developing cutting-edge material solutions,	49	Research and development
		3		We are constantly pursuing research and development (R&D) in substance	86	Report on Risks and Opportunities		Our aim to make research and production as environmentally friendly as possible has led to the	204-205	Resource Use and Circular Economy (E5)
		4		From the early stages of development, we keep an eye on the entire life cycle of a product including	113	General Disclosures (ESRS 2)		The optimization of the production of organic light-emitting diodes (OLED) at our site in Darmstadt,	204	Resource Use and Circular Economy (E5)
		5		We are focusing our R&D capabilities on next-generation semiconductor and optical materials to	45	Research and Development		Each research and development (R&D) project must complete and regularly update a business sector-	202	Resource Use and Circular Economy (E5)
		6		One notable example of collaboration is the academic research program we initiated with	45	Research and Development		For our extensive portfolio of specialty gases – including etching, cleaning, deposition, and dopant	204	Resource Use and Circular Economy (E5)
		7						In Planarization, several of our back-end-of-line products have entered advanced stages of	49	Research and development
		10								
Micro	Relational capabilities	1	2	In order to identify human rights and environmental risks, we conduct a risk analysis of	246	Workers in the Value Chain (S2)	2	Our response to this risk landscape is rooted in regional diversification, supply chain resilience and	90	Report on Risks and Opportunities
		2		We apply strict sustainability standards to our procurement activities. With our efforts in supplier	113	General Disclosures (ESRS 2)		In the Healthcare business sector, we effectively managed the supply of our medicines, ensuring	95	Report on Risks and Opportunities
		3		One notable example of collaboration is the academic research program we initiated with	45	Research and Development		In Electronics, we avoided major disruptions due to our strong supplier relationships and ongoing	96	Report on Risks and Opportunities
		4		Through proactive measures such as diversifying sourcing options, building	92	Report on Risks and Opportunities		Together for Sustainability (TfS) is a global initiative that brings together more than 50	250	Workers in the Value Chain (S2)
		5		In Electronics, events such as the earthquake in Taiwan early in the year and recent typhoons in	92	Report on Risks and Opportunities		Since 2021, we have invested over € 7 billion in over 30 new or expanded sites worldwide under	6	Letter of the CEO
		6		Through the TfS initiative, suppliers are assessed either based on information obtained during audits	248	Workers in the Value Chain (S2)		Most recently, we inaugurated our € 500 million Semiconductor Solutions megasite in Taiwan,	7	Letter of the CEO
		7		To address the complexity of our supply chains, we are a member of the Responsible Minerals	248	Workers in the Value Chain (S2)		Our supplier decarbonization program focuses on assessing and enhancing	159	Climate Change (E1)
		8		The policy governs our approach to the sourcing of minerals from conflict-affected and high-	243	Workers in the Value Chain (S2)				
		9		Our supplier management includes separate actions for tier-n-suppliers (indirect suppliers) in the	247	Workers in the Value Chain (S2)				
		10								
Micro	Sustainability capabilities	1	2	The policy governs our approach to the sourcing of minerals from conflict-affected and high-	243	Workers in the Values Chain (S2)	2	Our Procurement and Quality departments worked together to collect	249	Workers in the Value Chain (S2)
		2		The policy is relevant for the development of new products and the steering of the R&D	180	Pollution (E2)		Sustainability scorecards are used across all three business sectors to target and track	197	Resource Use and Circular Economy (E5)
		3		Our due diligence process is aligned with international standards. It involves establishing a	247	Workers in the Value Chain (S2)		We aim to achieve a Circularity Rate of 70% throughout the company as part of our waste	205	Resource Use and Circular Economy (E5)
		4		For example, we have access to a database for checking smelters and	248	Workers in the Value Chain (S2)		Our supplier sustainability score combines ratings of suppliers' ESG practices (primarily reflected in	247	Workers in the Value Chain (S2)
		5		In 2024, we launched the circularity rate, a new performance indicator that allows us to measure	196	Resource Use and Circular Economy (E5)		We conduct an annual risk analysis to identify and monitor our suppliers' human rights and	247	Workers in the Value Chain (S2)
		6		We strive for transparency in all our procurement regions. This is in direct relation to the	251	Workers in the Value Chain (S2)		To increase supply resilience, we identify and monitor relevant suppliers against criteria such as	251	Workers in the Value Chain (S2)
		7		The sustainability assessments are implemented across all business sectors using a	200	Resource Use and Circular Economy (E5)		The Combined Sustainability Statement was prepared in order to meet the	111	Introduction
		8		Audit evaluations in accordance with the Responsible Minerals Assurance Process (RMAP)	508	Independent Auditors Report				
		10								

9.2.7 Appendix 15: Application of the Coding Framework – Rheinmetall AG

CRM Coding Sheet — Rheinmetall AG

			2024				2025		
Level	Category	#	Score		Page	Section	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1	2	The introduction of the German Supply Chain Due Diligence Act (LkSG) in 2023 has resulted in new,	76	Significant corporate risks	2	On October 9, 2025, China drastically expanded its export restrictions on rare earths, introduced additional	28	Regulatory Environment
		2		This applies in particular to provisions relating to not only the environment, chemicals, hazardous	77	Significant corporate risks		The introduction of the German Supply Chain Duties Act (LkSG) in 2023 has given rise to new, additional	79	Significant corporate risks
		3		There is still no comprehensive easing on the global procurement markets. There are international capacity	74	Significant corporate risks		One building block of the EU Green Deal and the Action Plan on "Financing Sustainable Growth" is the	43	Strategy
		4		China has restricted the export of components, software and technology in the aerospace and gas	28	Basic information on the Rheinmetall Group		A transition plan for achieving climate neutrality by 2050 is currently being developed and is expected to	129	Environmental information
		5		The European Sustainability Reporting Standards (ESRS) of the European Commission are used as the reporting	91	General disclosures		The Statement of Principles in accordance with the German Supply Chain Due Diligence Act (LkSG)	110	General specifications
		6		One important measure of the European Union was therefore the definition of the EU Taxonomy, which is	107	Environmental protection and		"Physical climate risks can cause location-specific disruptions and lead to interruptions in operational	212	Summary of accounting principles
		7		Rheinmetall's Responsible Minerals Sourcing Policy from 2022 ensures that no raw materials are sourced	142	Social information		In order to ensure the responsible sourcing of minerals and raw materials, various regulations have been	147	Social information
		8						Risk analyses within the meaning of the LkSG are an integral part of the procurement process. These are	148	Social information
		9						The topics of environment, labour rights and human rights include the requirements of the LkSG. Suppliers	148	Social information
		10						Emissions from the upstream value chain are to be an integral part of the procurement strategy in the future.	129	Environmental information
Macro	Mimetic pressure response	1	1	An analysis of the transition risks was conducted internally in cooperation with the individual	123	Environmental protection and	1	Moreover, legal and administrative provisions, media reports, benchmark reports and scientific articles	99	General specifications
		2		An analysis was carried out to assess GHG emissions in relation to sales revenue and compare them with other	122	Environmental protection and		The risk analysis carried out is based on the results of the climate risk analysis, internal workshops and, in	127	Environmental information
		3		If we do not comply with the increasing regulatory requirements and fail to meet the expectations and	77	Significant corporate risks		These risks are counteracted by ongoing regulatory monitoring, which forms the basis for transparent and	80	Significant corporate risks
		4		ESG criteria are part of the supplier award decision. For example, an Ecovadis rating is an important	151	Governance				
		5		As a central function, the Rheinmetall Group Purchasing manages the purchasing organizations of	150	Governance				
		10								
Macro	Normative pressure response	1	2	In 2022, the Executive Board of Rheinmetall AG decided to extend ISO 14001 certification to all since	128	Environmental protection and	2	Rheinmetall actively counter these risks in various ways, including through high technical	80	Significant corporate risks
		2		The environmental management systems of the Rheinmetall companies are an integral part of	129	Environmental protection and		Emissions from the upstream value chain are to be an integral part of the procurement strategy in the future.	129	Environmental information
		3		Rheinmetall's major production sites are already certified in accordance with the ISO 50001 standard.	122	Environmental protection and		Thanks to its innovative strength, product portfolio, international reach and its own sustainability activities,	43	Strategy
		4		We actively counter these risks in various ways, including through high technical standards, integrated	77	Significant corporate risks		Rheinmetall's supplier management aims to create resilient supply chains. Long-term supplier	98	General specifications
		5		Rheinmetall is a member of the United Nations Global Compact, a globally established sustainability	143	Social information		Fair2All is a global framework agreement on the principles of social responsibility, covering the topics	110	General specifications
		6		Among other things, the SCoC refers to the OECD Guidelines for Multinational Enterprises, the ILO Core	142	Social information		In order to ensure the responsible sourcing of minerals and raw materials, various regulations have been	147	Social information
		7		Rheinmetall once again subjected its production sites to a comprehensive site-specific assessment, including	122	Environmental protection and		Rheinmetall maintains business relationships with numerous suppliers for the manufacture	146	Social information
		8		In a time in which markets are interconnected and the flow of information is becoming increasingly	76	Significant corporate risks		In terms of content, the SCoC refers, among other things, to the OECD Guidelines for Multinational	147	Social information
		9						The Global framework agreement on the principles of social responsibility Fair2All concluded	147	Social information
		10								

CRM Coding Sheet — Rheinmetall AG

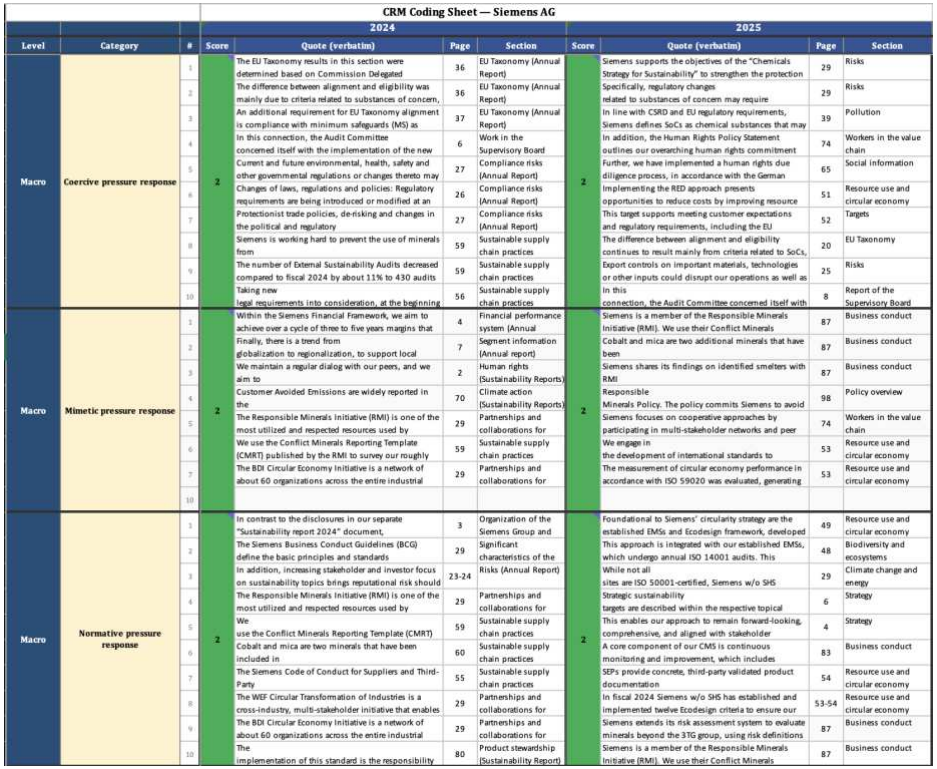
			2024				2025			
Level	Category	#	Score		Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1	1	The mining of raw materials such as bauxite, nitrocellulose (linters), tin, tungsten, copper, cobalt,	141	Social information	2	Rare earths and battery materials are especially in demand in industries such as automotive	28	Regulatory Environment
		2		Bottlenecks in supply and sharp fluctuations in prices for raw materials involve significant risks. Price risks for	73	Significant corporate risks		During the procurement and raw materials management phase, the com-	95	General specifications
		3		In September 2024, the US government decided to raise tariffs on Chinese imports to protect domestic	25	Regulatory environment		The associated expansion of capacities for propellant powders and explosives represents one of the key	38	Strategy
		4		In defence technology, supply chains are characterized by very complex military structures. The high	94	General disclosures		There is still no sign of a comprehensive easing of the situation on global procurement mar-	76	Significant Corporate Risks
		5						Climate change could also potentially disrupt the supply of raw materials and intermediate products	97	General specifications
		6						Commodity price risks – The Rheinmetall Group is exposed to price volatility risks from com-	250	Other explanatory information
		7						Acquisition of Hagedom-NC GmbH – On September 15, 2025, Rheinmetall Waffe Munition	214	Summary of accounting principles
		8						In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		9						Rheinmetall maintains business relationships with numerous suppliers for the manufacture	146	Social information
		10						Supply bottlenecks or sharp price fluctuations for raw materials, such as rare earths, pose	75	Significant Corporate Risks
Meso	Supply concentration	1	1	China has restricted the export of components, software and technology in the aero-	28	Strategy	2	Over 90% of the rare earth magnets processed in Europe come from China. China	28	Regulatory environment
		2		Risks can arise in connection with the purchasing of raw materials, parts and components by unexpected	73	Significant corporate risks		In addition, global supply shortages necessitate further relocation	84	Opportunity management
		3		With regard to China in particular, restrictions on trade opportunities would result in additional financial	151	Governance		De-risking and performance improvement: Reducing dependencies by broadening	37	Strategy
		4		In the defence technology industry, switching to new suppliers is very costly, both from a financial and time-	94	General disclosures		In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		5		So far, there is little insight into the deeper supply chains where potential risks may lie. The mining of raw	141	Social information		Acquisition of Hagedom-NC GmbH – On September 15, 2025, Rheinmetall Waffe Munition	214	Summary of accounting principles
		6		Furthermore, global supply problems in the semiconductor market are ongoing. These can have an	74	Risks and opportunities		In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		7		To ensure the stability of the supply chain, Rheinmetall must avoid becoming dependent on	151	Governance		Rheinmetall maintains business relationships with numerous suppliers for the manufacture	146	Social information
		8						In addition, electronic systems are being developed for both defence technology and	95	General specifications
		10								

CRM Coding Sheet — Rheinmetall AG

			2024				2025			
Level	Category	#	Score		Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Ecological risk	1	1	Human rights violations can affect workers in the far upstream value chain who are involved in the	142	Social information	1	Physical climate risks could have short-, medium- and long-term consequences at	97	General specifications
		2		In the upstream value chain, the raw materials supply disruptions and the disruption to the international	123	Environmental protection and		Crises pose a fundamental risk to supply chains. These may include geopolitical tensions,	76	Significant corporate risks
		3		Contextual Analysis An overview of the activities and business	96	General disclosures		In addition to general risks in the international procurement activities, country- and supplier-	76	Significant corporate risks
		4		In addition to general risks in our international procurement activities, country- and supplier-specific	73	Significant corporate risks		Workers in the upstream value chain who are involved in raw material extraction or processing in the	147	Social information
		5		The mining of raw materials such as bauxite, nitrocellulose (linters), tin, tungsten, copper, cobalt,	141	Social information		Some of Rheinmetall's technologically sophisticated production processes cur-	128	Environmental information
		6		The actual and potential effects on biological diversity and ecosystems were considered as part of the	97	Group sustainability statement		Physical climate risks can cause location-specific disruptions and lead to	212	Summary of accounting principles
		7						Physical climate risks could have short-, medium- and long-term consequences at	97	General specifications
		10								
Meso	Power gap	1	1	Bottlenecks in supply and sharp fluctuations in prices for raw materials involve significant risks. Price risks for	73	Significant corporate risks	1	Commodity price risks – The Rheinmetall Group is exposed to price volatility risks from com-	250	Other explanatory information
		2		Similar to hedging against interest rate and currency risks, risks from changes in prices are largely avoided in	75	Significant corporate risks		The main financial risks include liquidity risks, counterparty risks and market price risks arising from	77	Significant corporate risks
		3		In the defence technology industry, switching to new suppliers is very costly, both from a financial and time-	94	General disclosures		Excessive dependence on individual suppliers or countries of	157	Governance
		4		There is still no comprehensive easing on the global procurement markets. There are international capacity	74	Significant corporate risks		Furthermore, global supply problems in the semiconductor market are ongoing. These	76	Significant corporate risks
		5		The mood in the metal markets was determined more by macroeconomic factors than by specific news about	43	General economic conditions		The procurement of materials, whose raw materials are mined in countries with existing	98	General specifications
		6		The careful selection of efficient suppliers, ongoing supplier reviews, precise specifications and quality	73	Risks and opportunities		Risks may arise in connection with the procurement of raw materials, parts and components	75	Significant corporate risks
		7		To ensure the stability of the supply chain, Rheinmetall must avoid becoming dependent on	151	Governance		Supply bottlenecks or sharp price fluctuations for raw materials, such as rare earths, pose significant risks that	75	Significant corporate risks
		8						On October 9, 2025, China drastically expanded its export restrictions on rare earths, introduced additional	28	Regulatory Environment
		10								

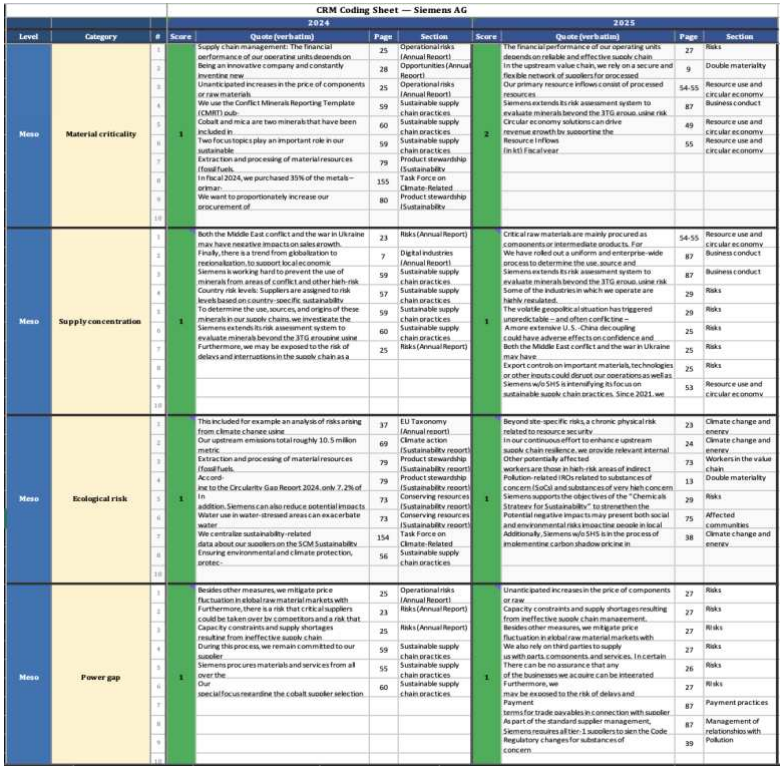
CRM Coding Sheet — Rheinmetall AG											
			2024				2025				
Level	Category	#	Score		Page	Section	Score	Quote (verbatim)	Page	Section
Micro	Technological capabilities	1	1	In addition, global supply shortages necessitate further relocation and insourcing of ammunition supply	81	Opportunity Management	1	In order to counter strategic bottle-necks in the supply chain, one of the measures taken	38	Strategy
		2		Within the framework of electrification, Rheinmetall is positioning itself specifically in the development of	33	Strategy		Rheinmetall can make a positive impact in the short term by continuously improving en-	97	General specifications
		3		Rheinmetall is striving to procure electricity from 100% renewable energy sources in the coming years	124	Environmental protection and		A photovoltaic sys-tem with a maximum output of 1,092 kWp was	129	Environmental information
		4						In addition to external factors and observations, the Rheinmetall Group invests in research,	74	Significant corporate risks
		5						The positive impact is potentially enhanced by the use of software to capture real-world	97	General specifications
		6						In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		10								
Micro	Relational capabilities	1	1	One key element for managing this area is the Rheinmetall Group Purchasing Council (RGP Council).	73	Significant corporate risks	1	The purchasing organisation is managed by the Chief Purchasing Officer (CPO). Management	75	Significant corporate risks
		2		The Strategic Group Purchasing Council forms the highest level in the central governance structure of the	150	Governance		As early as 2023, an interdisciplinary team was estab-lished to respond quickly to changes in the situation	76	Significant corporate risks
		3		Since 2023, the ESG Supply Chain team function has been responsible for the topic of social responsibility	144	Social Information		The Strategic Group Purchasing Council is the highest level in the Rheinmetall Group's central	157	Governance
		4		Signing the SCoC is mandatory for direct suppliers as part of the onboarding process. Only in exceptional	142	Social Information		Plans to build new plants in Lithuania, Latvia and Bulgaria, each as a joint venture, and the	84	Opportunity Management
		5		In the first stage, an abstract risk analysis is carried out using established, external software solutions to	143	Social Information		Rheinmetall has analyzed CO2 emissions in its upstream supply chain (Scope 3, Cat. 1) and	129	Environmental information
		6		Rheinmetall is actively involved in the Automotive Sector Dialogue. The National Action Plan (NAP) for	143	Social Information		The objective of the purchasing organisation is to build resilient supply	157	Governance
		7		Among other things, Loc Performance will be integrated into Rheinmetall's internal supply chains for	202	Summary of accounting principles		Acquisition of Hagedorn-NC GmbH – On September 15, 2025, Rheinmetall Waffe Munition	214	Summary of accounting principles
		8		The careful selection of efficient suppliers, ongoing supplier reviews, precise specifications and quality	73	Significant corporate risks		In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		9		To ensure the stability of the supply chain, Rheinmetall must avoid becoming dependent on	151	Governance		Rheinmetall maintains business relationships with numerous suppliers for the manufacture	146	Social information
		10								
Micro	Sustainability capabilities	1	2	A software solution is to be implemented as a foundation to further reduce GHG emissions in the	124	Environmental protection and	2	Back in 2023, Rheinmetall introduced a system for analysing human rights and environmental	76	Significant corporate risks
		2		The double materiality analysis did not identify any material impacts, risks and opportunities in	142	Social information		Existing suppliers are also part of the two-stage risk analysis. Compliance with the	148	Social information
		3		Risk analyses as defined by the LkSG are an integral part of the procurement process. These are carried out as	151	Governance		In light of this, the 'Supply Chain Transparency and Risk Management' project	147	Social information
		4		Human rights violations can affect workers in the far upstream value chain who are involved in the	142	Social information		Notwithstanding the achievements already made, Rheinmetall continues to advance the	134	Environmental information
		5		The European Sustainability Reporting Standards (ESRS) of the European Commission are used as the reporting	91	General disclosures		Rheinmetall assessed the material impacts, risks and opportunities relating to environmental	133	Environmental information
		6		ESG criteria are part of the supplier award decision. For example, an Ecovadis rating is an important	151	Governance		In addition to policies and specifications, the ESG supply chain team has been operating	149	Social information
		7		Rheinmetall's Responsible Minerals Sourcing Policy from 2022 ensures that no raw materials are sourced	142	Social information		The SCoC defines the requirements for suppliers with regard to human rights, working condi-	147	Social information
		8		In the second stage, the specific risk analysis is carried out using EcoVadis ratings. The supplier itself is	143	Group sustainability statement		Rheinmetall has identified three key pillars to help reduce and prevent environmental pollu-	133	Environmental information
		10								

9.2.8 Appendix 16: Application of the Coding Framework – Siemens AG



CRM Coding Sheet — Siemens AG

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Macro	Coercive pressure response	1	2	The EU Taxonomy results in this section were determined based on Commission Delegated	36	EU Taxonomy (Annual Report)	2	Siemens supports the objectives of the "Chemicals	29	Risks
		2		The difference between alignment and eligibility was mainly due to criteria related to substances of concern,	36	EU Taxonomy (Annual Report)		Strategy for Sustainability" to strengthen the protection Specifically, regulatory changes	29	Risks
		3		An additional requirement for EU Taxonomy alignment is compliance with minimum safeguards (MS) as	37	EU Taxonomy (Annual Report)		related to substances of concern may require In line with CSRD and EU regulatory requirements,	39	Pollution
		4		In this connection, the Audit Committee concerned itself with the implementation of the new	6	Work in the Supervisory Board		Siemens defines SoCs as chemical substances that may In addition, the Human Rights Policy Statement	74	Workers in the value chain
		5		Current and future environmental, health, safety and other governmental regulations or changes thereto may	27	Compliance risks (Annual Report)		outlines our overarching human rights commitment Further, we have implemented a human rights due	65	Social information
		6		Changes of laws, regulations and policies: Regulatory requirements are being introduced or modified at an	26	Compliance risks (Annual Report)		diligence process, in accordance with the German Implementing the RED approach presents	51	Resource use and circular economy
		7		Protectionist trade policies, de-risking and changes in the political and regulatory	27	Compliance risks (Annual Report)		opportunities to reduce costs by improving resource This target supports meeting customer expectations and regulatory requirements, including the EU	52	Targets
		8		Siemens is working hard to prevent the use of minerals from	59	Sustainable supply chain practices		The difference between alignment and eligibility continues to result mainly from criteria related to SoCs,	20	EU Taxonomy
		9		The number of External Sustainability Audits decreased compared to fiscal 2024 by about 11% to 430 audits	59	Sustainable supply chain practices		Export controls on important materials, technologies or other inputs could disrupt our operations as well as	25	Risks
		10		Taking new legal requirements into consideration, at the beginning	56	Sustainable supply chain practices		In this connection, the Audit Committee concerned itself with	8	Report of the Supervisory Board
Macro	Mimetic pressure response	1	2	Within the Siemens Financial Framework, we aim to achieve over a cycle of three to five years margins that	4	Financial performance system (Annual	2	Siemens is a member of the Responsible Minerals Initiative (RMI). We use their Conflict Minerals	87	Business conduct
		2		Finally, there is a trend from globalization to regionalization, to support local	7	Segment information (Annual report)		Cobalt and mica are two additional minerals that have been	87	Business conduct
		3		We maintain a regular dialog with our peers, and we aim to	2	Human rights (Sustainability Reports)		Siemens shares its findings on identified smelters with RMI	87	Business conduct
		4		Customer Avoided Emissions are widely reported in the	70	Climate action (Sustainability Reports)		Responsible Minerals Policy. The policy commits Siemens to avoid	98	Policy overview
		5		The Responsible Minerals Initiative (RMI) is one of the most utilized and respected resources used by	29	Partnerships and collaborations for		Siemens focuses on cooperative approaches by participating in multi-stakeholder networks and peer	74	Workers in the value chain
		6		We use the Conflict Minerals Reporting Template (CMRT) published by the RMI to survey our roughly	59	Sustainable supply chain practices		We engage in the development of international standards to	53	Resource use and circular economy
		7		The BDI Circular Economy Initiative is a network of about 60 organizations across the entire industrial	29	Partnerships and collaborations for		The measurement of circular economy performance in accordance with ISO 59020 was evaluated, generating	53	Resource use and circular economy
		10								
Macro	Normative pressure response	1	2	In contrast to the disclosures in our separate "Sustainability report 2024" document,	3	Organization of the Siemens Group and	2	Foundational to Siemens' circularity strategy are the established EMSs and Ecodesign framework, developed	49	Resource use and circular economy
		2		The Siemens Business Conduct Guidelines (BCG) define the basic principles and standards	29	Significant characteristics of the		This approach is integrated with our established EMSs, which undergo annual ISO 14001 audits. This	48	Biodiversity and ecosystems
		3		In addition, increasing stakeholder and investor focus on sustainability topics brings reputational risk should	23-24	Risks (Annual Report)		While not all sites are ISO 50001-certified, Siemens w/o SHS	29	Climate change and energy
		4		The Responsible Minerals Initiative (RMI) is one of the most utilized and respected resources used by	29	Partnerships and collaborations for		Strategic sustainability targets are described within the respective topical	6	Strategy
		5		We use the Conflict Minerals Reporting Template (CMRT)	59	Sustainable supply chain practices		This enables our approach to remain forward-looking, comprehensive, and aligned with stakeholder	4	Strategy
		6		Cobalt and mica are two minerals that have been included in	60	Sustainable supply chain practices		A core component of our CMS is continuous monitoring and improvement, which includes	83	Business conduct
		7		The Siemens Code of Conduct for Suppliers and Third-Party	55	Sustainable supply chain practices		SEPs provide concrete, third-party validated product documentation	54	Resource use and circular economy
		8		The WEF Circular Transformation of Industries is a cross-industry, multi-stakeholder initiative that enables	29	Partnerships and collaborations for		In fiscal 2024 Siemens w/o SHS has established and implemented twelve Ecodesign criteria to ensure our	53-54	Resource use and circular economy
		9		The BDI Circular Economy Initiative is a network of about 60 organizations across the entire industrial	29	Partnerships and collaborations for		Siemens extends its risk assessment system to evaluate minerals beyond the 3TG group, using risk definitions	87	Business conduct
		10		The implementation of this standard is the responsibility	80	Product stewardship (Sustainability Report)		Siemens is a member of the Responsible Minerals Initiative (RMI). We use their Conflict Minerals	87	Business conduct



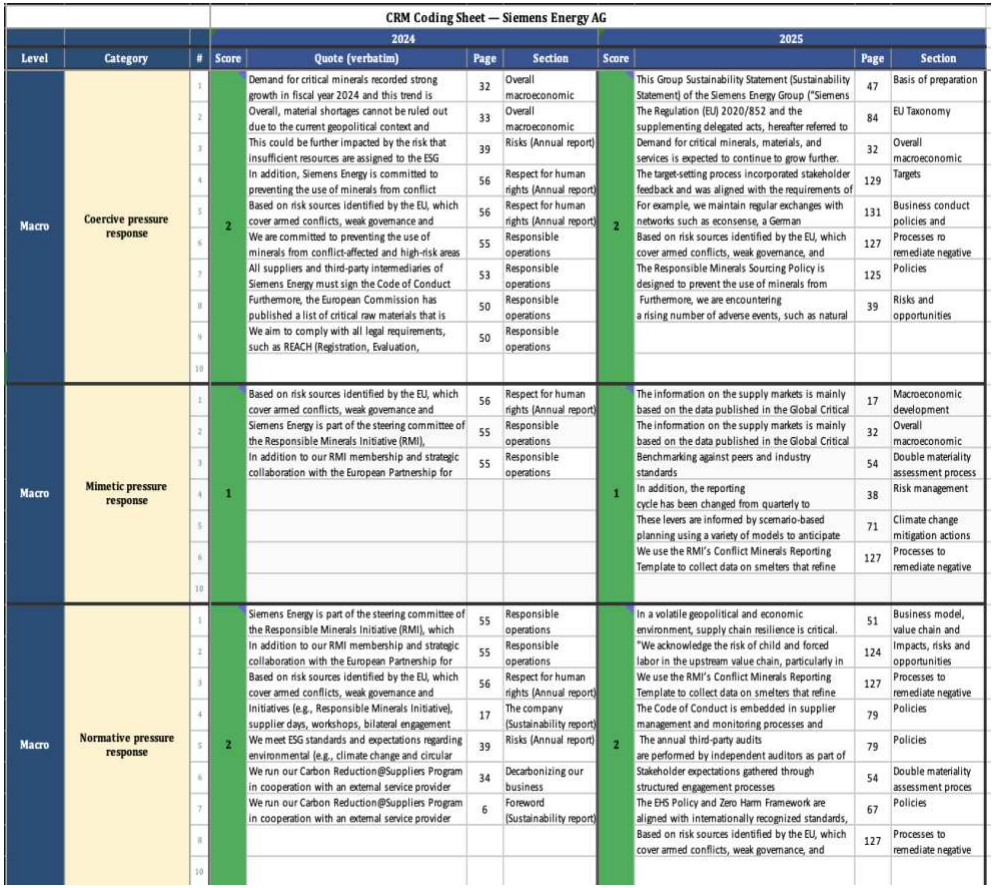
CRM Coding Sheet — Siemens AG

			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Meso	Material criticality	1	1	Supply chain management. The financial performance of our operating units depends on	25	Operational risks (Annual Report)	2	The financial performance of our operating units depends on reliable and effective supply chain	27	Risks
		2		Being an innovative company and constantly inventing new	28	Opportunities (Annual Report)		In the upstream value chain, we rely on a secure and flexible network of suppliers for processed	9	Double materiality
		3		Unanticipated increases in the price of components or raw materials	25	Operational risks (Annual Report)		Our primary resource inflows consist of processed resources	54-55	Resource use and circular economy
		4		We use the Conflict Minerals Reporting Template (CMRT) sub-	59	Sustainable supply chain practices		Siemens extends its risk assessment system to evaluate minerals beyond the 3TG group, using risk	87	Business conduct
		5		Cobalt and mica are two minerals that have been included in	60	Sustainable supply chain practices		Circular economy solutions can drive revenue growth by supporting the	49	Resource use and circular economy
		6		Two focus topics play an important role in our sustainable	59	Sustainable supply chain practices		Resource Inflows (in kt) Fiscal year	55	Resource use and circular economy
		7		Extraction and processing of material resources (fossil fuels,	79	Product stewardship (Sustainability				
		8		In fiscal 2024, we purchased 35% of the metals – primari-	155	Task Force on Climate-Related				
		9		We want to proportionately increase our procurement of	80	Product stewardship (Sustainability				
		10								
Meso	Supply concentration	1	1	Both the Middle East conflict and the war in Ukraine may have negative impacts on sales growth.	23	Risks (Annual Report)	1	Critical raw materials are mainly procured as components or intermediate products. For	54-55	Resource use and circular economy
		2		Finally, there is a trend from globalization to regionalization, to support local economic	7	Digital industries (Annual Report)		We have rolled out a uniform and enterprise-wide process to determine the use, source and	87	Business conduct
		3		Siemens is working hard to prevent the use of minerals from areas of conflict and other high-risk	59	Sustainable supply chain practices		Siemens extends its risk assessment system to evaluate minerals beyond the 3TG group, using risk	87	Business conduct
		4		Country risk levels: Suppliers are assigned to risk levels based on country-specific sustainability	57	Sustainable supply chain practices		Some of the industries in which we operate are highly regulated.	29	Risks
		5		To determine the use, sources, and origins of these minerals in our supply chains, we investigate the	59	Sustainable supply chain practices		The volatile geopolitical situation has triggered unpredictable – and often conflicting –	29	Risks
		6		Siemens extends its risk assessment system to evaluate minerals beyond the 3TG group, using	60	Sustainable supply chain practices		A more extensive U.S. -China decoupling could have adverse effects on confidence and	25	Risks
		7		Furthermore, we may be exposed to the risk of delays and interruptions in the supply chain as a	25	Risks (Annual Report)		Both the Middle East conflict and the war in Ukraine may have	25	Risks
		8						Export controls on important materials, technologies or other inputs could disrupt our operations as well as	25	Risks
		9						Siemens w/o SHS is intensifying its focus on sustainable supply chain practices. Since 2021, we	53	Resource use and circular economy
		10								
Meso	Ecological risk	1	1	This included for example an analysis of risks arising from climate change using	37	EU Taxonomy (Annual report)	1	Beyond site-specific risks, a chronic physical risk related to resource security	23	Climate change and energy
		2		Our upstream emissions total roughly 10.5 million metric	69	Climate action (Sustainability report)		In our continuous effort to enhance upstream supply chain resilience, we provide relevant internal	24	Climate change and energy
		3		Extraction and processing of material resources (fossil fuels,	79	Product stewardship (Sustainability report)		Other potentially affected workers are those in high-risk areas of indirect	73	Workers in the value chain
		4		Accord- ing to the Circularity Gap Report 2024, only 7.2% of	79	Product stewardship (Sustainability report)		Pollution-related IROs related to substances of concern (SoCs) and substances of very high concern	13	Double materiality
		5		In addition, Siemens can also reduce potential impacts	73	Conserving resources (Sustainability report)		Siemens supports the objectives of the "Chemicals Strategy for Sustainability" to strengthen the	29	Risks
		6		Water use in water-stressed areas can exacerbate water	73	Conserving resources (Sustainability report)		Potential negative impacts may present both social and environmental risks in our the people in local	75	Affected communities
		7		We centralize sustainability-related data about our suppliers on the SCM Sustainability	154	Task Force on Climate-Related		Additionally, Siemens w/o SHS is in the process of implementing carbon shadow pricing in	38	Climate change and energy
		8		Ensuring environmental and climate protection, protec-	56	Sustainable supply chain practices				
		10								
Meso	Power gap	1	1	Besides other measures, we mitigate price fluctuation in global raw material markets with	25	Operational risks (Annual Report)	1	Unanticipated increases in the price of components or raw	27	Risks
		2		Furthermore, there is a risk that critical suppliers could be taken over by competitors and a risk that	23	Risks (Annual Report)		Capacity constraints and supply shortages resulting from ineffective supply chain management.	27	Risks
		3		Capacity constraints and supply shortages resulting from ineffective supply chain	25	Risks (Annual Report)		Besides other measures, we mitigate price fluctuation in global raw material markets with	27	Risks
		4		During this process, we remain committed to our supplier	59	Sustainable supply chain practices		We also rely on third parties to supply us with parts, components, and services. In certain	27	Risks
		5		Siemens procures materials and services from all over the	55	Sustainable supply chain practices		There can be no assurance that any of the businesses we acquire can be integrated	26	Risks
		6		Our special focus regarding the cobalt supplier selection	60	Sustainable supply chain practices		Furthermore, we may be exposed to the risk of delays and	27	Risks
		7						Payment terms for trade payables in connection with supplier	87	Payment practices
		8						As part of the standard supplier management, Siemens requires all Tier-1 suppliers to sign the Code	87	Management of relationships with Pollution
		9						Regulatory changes for substances of concern	39	
		10								

CRM Coding Sheet — Siemens AG

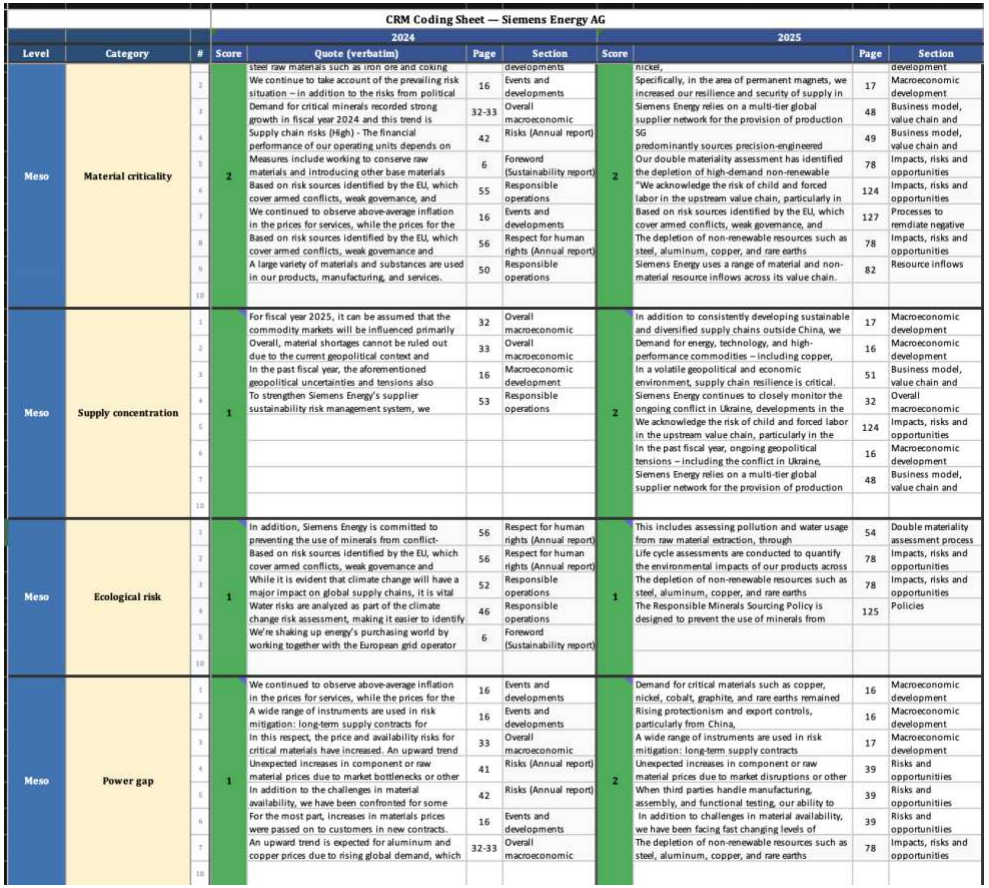
			2024				2025			
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score	Quote (verbatim)	Page	Section
Micro	Technological capabilities	1	2	On the one hand, the criteria for substantial contribution for the activity Manufacture of	36	EU Taxonomy (Annual Report)	2	We incorporate Ecodesign into our product design. This approach enables us to identify	55	Resource use and circular economy
		2		The 12 Ecodesign criteria are part of these design alternatives and are considered in the Product	82	Product stewardship (Sustainability report)		In fiscal 2025, we increased the substitution rate of standard thermoplastics with sustainability-	51	Resource use and circular economy
		3		In fiscal 2024, we purchased 35% of the metals – - primarily iron, copper, and aluminum used in	81	Product stewardship (Sustainability report)		Siemens w/o SHS demonstrates its commitment to integrating resource efficiency and circularity into	50	Resource use and circular economy
		4		In fiscal 2024 we strengthened our Environmental Protection	83	Product stewardship (Sustainability report)		Complementing these, Retrofit and modernization services are key	54	Resource use and circular economy
		5		In fiscal 2024, Siemens increased the portfolio of sustainable	84	Product stewardship (Sustainability report)		Predictive maintenance solutions maximize existing resources, reduce waste, lower energy	54	Resource use and circular economy
		6						We facilitate this data-driven circularity through Digital Product Passports by supporting material	54	Resource use and circular economy
		7						Siemens w/o SHS has further deployed an automatized data collection and analysis	30	Climate change and energy
		8						EPDs are created by our automated and systematic solution for facilitating transparency.	54	Resource use and circular economy
		9						Additionally, Siemens w/o SHS is in the process of implementing carbon shadow pricing in	38	Climate change and energy
		10						In fiscal 2025, Siemens w/o SHS set-up continuous employee training programs to further	54	Resource use and circular economy
Micro	Relational capabilities	1	2	To support the responsible sourcing of minerals, we	59	Sustainable supply chain practices	2	Siemens is a member of the Responsible Minerals Initiative (RMI). We use their Conflict Minerals	87	Business conduct
		2		Siemens is a member of the Responsible Minerals Initiative (RMI), an organization of more than 500	59	Sustainable supply chain practices		We have rolled out a uniform and enterprise-wide process to determine the use, source and	87	Business conduct
		3		Siemens supports the smelters as they move toward the final	59	Sustainable supply chain practices		This program supports suppliers in setting targets and developing action plans to reduce their	31	Climate change and energy
		4		Sustainable business practices are an integral part of our	56	Sustainable supply chain practices		We monitor supplier compliance through Corporate Responsibility Self-Assessments (CRSA)	74	Workers in the value chain
		5		The number of completed CRSAs increased by about 35%	58	Sustainable supply chain practices		Non-compliance findings in the ESAs are documented in Corrective Action Plans (CAP),	73	Health and Safety
		6		From our perspective, ESAs are the most effective means of	58	Sustainable supply chain practices		Siemens' sustainability requirements are embedded company-wide in harmonized,	87	Business conduct
		7		The number of External Sustainability Audits decreased	59	Sustainable supply chain practices		In addition, Siemens also provides interactive training for internal stakeholders focusing on	74	Workers in the value chain
		8		We centralize sustainability-related data about our suppliers on the SCM	154	Task Force on Climate-Related		Siemens focuses on cooperative approaches by participating in multi-stakeholder networks and	74	Workers in the value chain
		9		For companies and units that become part of the Siemens Group,	37	EU Taxonomy (Annual Report)		It is also intended to further intensify engagement with our supply	31	Climate change and energy
		10		Siemens also provides web-based trainings on sustainability and human rights in the supply	57	Sustainable supply chain practices		Incorporating sustainability criteria in supplier relationship management can	86	Business conduct
Micro	Sustainability capabilities	1	2	As supplementary information, amounts related to such non-financial matters, and additional	3	Organization of the Siemens Group and	2	Siemens w/o SHS maintains a global substance declaration process to promote material	41	Pollution
		2		The environmental impacts of our Homogeneous Product	82	Product stewardship (Sustainability report)		Pollution-related IROs related to substances of concern (SoCs) and substances of very high	13	Double materiality
		3		The Siemens proprietary due diligence tool that is being	53	Human rights (Sustainability report)		Further addressed is the preparation of LCAs, EPDs, and Siemens EcoTech Profiles (SEPs) – tools that	50	Resource use and circular economy
		4		More than 100 Subject Matter Experts have been appointed	53	Human rights (Sustainability report)		In fiscal 2025, we increased the delivery of	52	Resource use and circular economy
		5		A further focus of the Audit Committee's activities in fiscal 2024 was SHERPA X, a transformation	6	Report of the Supervisory Board		The implementation of EMSs at our environmentally relevant sites worldwide, for	54	Resource use and circular economy
		6		In fiscal 2024, we upgraded the Ecodesign Appendix with 12 specific	80	Product stewardship (Sustainability report)		Siemens Healthineers has implemented a global tool to manage SDS provided by suppliers, that	41	Pollution
		7		Robust Eco Design (RED) approach: At the center of the Responsible Product Development program	155	Task-Force on Climate Related		In fiscal 2025, we completed the SBAT assessment for all environmentally relevant sites, integrating	48	Biodiversity and ecosystems
		8		In fiscal 2024, Siemens EcoTech Profiles were awarded,	84	Product stewardship (Sustainability report)		The Corporate Sustainability Reporting Directive (CSRD) Reporting Guideline defines the processes	17	Sustainability governance
		9		5,356 suppliers – who represent 50% of our Scope 3	60	Sustainable supply chain practices		The effectiveness of the assessment is ensured through the RMS audit process. Siemens shares its	87	Business conduct
		10								

9.2.9 Appendix 17: Application of the Coding Framework – Siemens Energy AG



CRM Coding Sheet — Siemens Energy AG

			2024				2025		
Level	Category	#	Score	Quote (verbatim)	Page	Section	Score		Page	Section
Macro	Coercive pressure response	1	2	Demand for critical minerals recorded strong growth in fiscal year 2024 and this trend is	32	Overall macroeconomic	2	This Group Sustainability Statement (Sustainability Statement) of the Siemens Energy Group ("Siemens	47	Basis of preparation
		2		Overall, material shortages cannot be ruled out due to the current geopolitical context and	33	Overall macroeconomic		The Regulation (EU) 2020/852 and the supplementing delegated acts, hereafter referred to	84	EU Taxonomy
		3		This could be further impacted by the risk that insufficient resources are assigned to the ESG	39	Risks (Annual report)		Demand for critical minerals, materials, and services is expected to continue to grow further.	32	Overall macroeconomic
		4		In addition, Siemens Energy is committed to preventing the use of minerals from conflict	56	Respect for human rights (Annual report)		The target-setting process incorporated stakeholder feedback and was aligned with the requirements of	129	Targets
		5		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		For example, we maintain regular exchanges with networks such as econsense, a German	131	Business conduct policies and
		6		We are committed to preventing the use of minerals from conflict-affected and high-risk areas	55	Responsible operations		Based on risk sources identified by the EU, which cover armed conflicts, weak governance, and	127	Processes ro remediate negative
		7		All suppliers and third-party intermediaries of Siemens Energy must sign the Code of Conduct	53	Responsible operations		The Responsible Minerals Sourcing Policy is designed to prevent the use of minerals from	125	Policies
		8		Furthermore, the European Commission has published a list of critical raw materials that is	50	Responsible operations		Furthermore, we are encountering a rising number of adverse events, such as natural	39	Risks and opportunities
		9		We aim to comply with all legal requirements, such as REACH (Registration, Evaluation,	50	Responsible operations				
		10								
Macro	Mimetic pressure response	1	1	Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)	1	The information on the supply markets is mainly based on the data published in the Global Critical	17	Macroeconomic development
		2		Siemens Energy is part of the steering committee of the Responsible Minerals Initiative (RMI),	55	Responsible operations		The information on the supply markets is mainly based on the data published in the Global Critical	32	Overall macroeconomic
		3		In addition to our RMI membership and strategic collaboration with the European Partnership for	55	Responsible operations		Benchmarking against peers and industry standards	54	Double materiality assessment process
		4						In addition, the reporting cycle has been changed from quarterly to	38	Risk management
		5						These levers are informed by scenario-based planning using a variety of models to anticipate	71	Climate change mitigation actions
		6						We use the RMI's Conflict Minerals Reporting Template to collect data on smelters that refine	127	Processes to remediate negative
		10								
Macro	Normative pressure response	1	2	Siemens Energy is part of the steering committee of the Responsible Minerals Initiative (RMI), which	55	Responsible operations	2	In a volatile geopolitical and economic environment, supply chain resilience is critical.	51	Business model, value chain and
		2		In addition to our RMI membership and strategic collaboration with the European Partnership for	55	Responsible operations		"We acknowledge the risk of child and forced labor in the upstream value chain, particularly in	124	Impacts, risks and opportunities
		3		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		We use the RMI's Conflict Minerals Reporting Template to collect data on smelters that refine	127	Processes to remediate negative
		4		Initiatives (e.g., Responsible Minerals Initiative), supplier days, workshops, bilateral engagement	17	The company (Sustainability report)		The Code of Conduct is embedded in supplier management and monitoring processes and	79	Policies
		5		We meet ESG standards and expectations regarding environmental (e.g., climate change and circular	39	Risks (Annual report)		The annual third-party audits are performed by independent auditors as part of	79	Policies
		6		We run our Carbon Reduction@Suppliers Program in cooperation with an external service provider	34	Decarbonizing our business		Stakeholder expectations gathered through structured engagement processes	54	Double materiality assessment proces
		7		We run our Carbon Reduction@Suppliers Program in cooperation with an external service provider	6	Foreword (Sustainability report)		The EHS Policy and Zero Harm Framework are aligned with internationally recognized standards,	67	Policies
		8						Based on risk sources identified by the EU, which cover armed conflicts, weak governance, and	127	Processes to remediate negative
		10								



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				steel raw materials such as iron ore and coking		developments		nickel,		development
Meso	Material criticality	2	2	We continue to take account of the prevailing risk situation – in addition to the risks from political	16	Events and developments	2	Specifically, in the area of permanent magnets, we increased our resilience and security of supply in	17	Macroeconomic development
		3		Demand for critical minerals recorded strong growth in fiscal year 2024 and this trend is	32-33	Overall macroeconomic		Siemens Energy relies on a multi-tier global supplier network for the provision of production	48	Business model, value chain and
		4		Supply chain risks (High) - The financial performance of our operating units depends on	42	Risks (Annual report)		SG predominantly sources precision-engineered	49	Business model, value chain and
		5		Measures include working to conserve raw materials and introducing other base materials	6	Foreword (Sustainability report)		Our double materiality assessment has identified the depletion of high-demand non-renewable	78	Impacts, risks and opportunities
		6		Based on risk sources identified by the EU, which cover armed conflicts, weak governance, and	55	Responsible operations		"We acknowledge the risk of child and forced labor in the upstream value chain, particularly in	124	Impacts, risks and opportunities
		7		We continued to observe above-average inflation in the prices for services, while the prices for the	16	Events and developments		Based on risk sources identified by the EU, which cover armed conflicts, weak governance, and	127	Processes to remdiate negative
		8		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		The depletion of non-renewable resources such as steel, aluminum, copper, and rare earths	78	Impacts, risks and opportunities
		9		A large variety of materials and substances are used in our products, manufacturing, and services.	50	Responsible operations		Siemens Energy uses a range of material and non-material resource inflows across its value chain.	82	Resource inflows
		10								
Meso	Supply concentration	1	1	For fiscal year 2025, it can be assumed that the commodity markets will be influenced primarily	32	Overall macroeconomic	2	In addition to consistently developing sustainable and diversified supply chains outside China, we	17	Macroeconomic development
		2		Overall, material shortages cannot be ruled out due to the current geopolitical context and	33	Overall macroeconomic		Demand for energy, technology, and high-performance commodities – including copper,	16	Macroeconomic development
		3		In the past fiscal year, the aforementioned geopolitical uncertainties and tensions also	16	Macroeconomic development		In a volatile geopolitical and economic environment, supply chain resilience is critical.	51	Business model, value chain and
		4		To strengthen Siemens Energy's supplier sustainability risk management system, we	53	Responsible operations		Siemens Energy continues to closely monitor the ongoing conflict in Ukraine, developments in the	32	Overall macroeconomic
		5						We acknowledge the risk of child and forced labor in the upstream value chain, particularly in the	124	Impacts, risks and opportunities
		6						In the past fiscal year, ongoing geopolitical tensions – including the conflict in Ukraine,	16	Macroeconomic development
		7						Siemens Energy relies on a multi-tier global supplier network for the provision of production	48	Business model, value chain and
		10								
Meso	Ecological risk	1	1	In addition, Siemens Energy is committed to preventing the use of minerals from conflict-	56	Respect for human rights (Annual report)	1	This includes assessing pollution and water usage from raw material extraction, through	54	Double materiality assessment process
		2		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		Life cycle assessments are conducted to quantify the environmental impacts of our products across	78	Impacts, risks and opportunities
		3		While it is evident that climate change will have a major impact on global supply chains, it is vital	52	Responsible operations		The depletion of non-renewable resources such as steel, aluminum, copper, and rare earths	78	Impacts, risks and opportunities
		4		Water risks are analyzed as part of the climate change risk assessment, making it easier to identify	46	Responsible operations		The Responsible Minerals Sourcing Policy is designed to prevent the use of minerals from	125	Policies
		5		We're shaking up energy's purchasing world by working together with the European grid operator	6	Foreword (Sustainability report)				
		10								
Meso	Power gap	1	1	We continued to observe above-average inflation in the prices for services, while the prices for the	16	Events and developments	2	Demand for critical materials such as copper, nickel, cobalt, graphite, and rare earths remained	16	Macroeconomic development
		2		A wide range of instruments are used in risk mitigation: long-term supply contracts for	16	Events and developments		Rising protectionism and export controls, particularly from China,	16	Macroeconomic development
		3		In this respect, the price and availability risks for critical materials have increased. An upward trend	33	Overall macroeconomic		A wide range of instruments are used in risk mitigation: long-term supply contracts	17	Macroeconomic development
		4		Unexpected increases in component or raw material prices due to market bottlenecks or other	41	Risks (Annual report)		Unexpected increases in component or raw material prices due to market disruptions or other	39	Risks and opportunities
		5		In addition to the challenges in material availability, we have been confronted for some	42	Risks (Annual report)		When third parties handle manufacturing, assembly, and functional testing, our ability to	39	Risks and opportunities
		6		For the most part, increases in materials prices were passed on to customers in new contracts.	16	Events and developments		In addition to challenges in material availability, we have been facing fast changing levels of	39	Risks and opportunities
		7		An upward trend is expected for aluminum and copper prices due to rising global demand, which	32-33	Overall macroeconomic		The depletion of non-renewable resources such as steel, aluminum, copper, and rare earths	78	Impacts, risks and opportunities
		10								

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Micro	Technological capabilities	1	2	In our wind power business, RecyclableBlades – the world's first wind turbine blade that can be	49	Responsible operations	2	Siemens Energy focusses its R&D activities on innovative materials and advanced manufacturing	11	Research and development						
		2		To start decarbonizing raw materials, we've identified ten actions over the next five years,	6	Foreword (Sustainability report)		In addition to consistently developing sustainable and diversified supply chains outside China, we	17	Macroeconomic development						
		3		We continued identifying circularity potentials with our research collaboration on the Circular	49	Responsible operations		Life cycle assessments are conducted to quantify the environmental impacts of our products across	78	Impacts, risks and opportunities						
		4		The number of LCAs increased in fiscal year 2024 because all Business Areas continuously work to	49	Responsible operations		To calculate net resource inflows and the share of secondary materials, Siemens Energy uses the	82	Resource inflows						
		5		Investments were also made in connection with dual-sourcing measures to mitigate procurement	29	Analysis of cash flow and investments		In fiscal year 2025, the total calculated weight of products and technical and biological materials	82	Resource inflows						
		6		A large variety of materials and substances are used in our products, manufacturing, and services.	50	Responsible operations		Tower made of greener steel in wind turbines, with steel with a maximum of	81	Actions						
		7		To make our LCA knowledge tangible for internal and external stakeholders, we use our LCA-based	50	Responsible operations		Analysis of eco-design potentials through our EcoDesign questionnaire., Enhanced	81	Actions						
		8		We aim to promote the ramp-up of green hydrogen and economy-wide decarbonization	17	The Company (Sustainability report)										
		10														
Micro	Relational capabilities	1	2	We're shaking up energy's purchasing world by working together with	6	Foreword (Sustainability report)	2	A wide range of instruments are used in risk mitigation: long-term supply contracts	17	Macroeconomic development						
		2		Siemens Energy is part of the steering committee of the Responsible	55	Responsible operations		In a volatile geopolitical and economic environment, supply chain resilience is critical.	51	Business model, value chain and						
		3		In addition to our RMI membership and strategic collaboration	55	Responsible operations		Through our Carbon Reduction@Suppliers Program, we engage over 3,400 suppliers—	71	Actions and resources						
		4		When surveying our approximately 1,300 (fiscal year 2023: 1,400) relevant	55	Responsible operations		These efforts are supported by external audits, smelter assessments under the Responsible	56	Double materiality assessment process						
		5		All suppliers and third-party intermediaries of Siemens Energy must sign	53	Responsible operations		Initiatives (e.g., Responsible Minerals Initiative, supplier days, workshops)	52	Interests and views of stakeholders						
		6		We run our Carbon Reduction@Suppliers Program in cooperation with an	34	Decarbonizing our business		Promoting partnerships within the metal supply chain to improve tracea-	81	Actions						
		7		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		When material negative impacts on value chain workers are identified, a corrective action plan is	126	Processes to remediate negative						
		8		We aim to promote the ramp-up of green hydrogen and economy-wide	17	The Company (Sustainability report)		Siemens Energy relies on a multi-tier global supplier network for the provision of production	48	Business model, value chain and						
		9						"We acknowledge the risk of child and forced labor in the upstream value chain, particularly in	124	Impacts, risks and opportunities						
		10														
Micro	Sustainability capabilities	1	2	We are committed to preventing the use of minerals from conflict-affected	55	Responsible operations	2	Annual risk assessments of the entire supplier base	56	Double materiality assessment process	Through our	71	Actions and			
		2		Using our sustainability risk analysis system, we systematically identify	53	Responsible operations		To identify material risks related to resource use, circularity, and environmental impacts in our	78	Impacts, risks and opportunities						
		3		To strengthen Siemens Energy's supplier sustainability risk management	53	Responsible operations		Based on risk sources identified by the EU, which cover armed conflicts, weak governance, and	127	Processes to remediate negative						
		4		Our risk management includes an ESG due diligence approach for	48	Responsible operations		Siemens Energy is committed to working with suppliers that uphold responsible business	124	Policies						
		5		In order to identify risks at an early stage, initiate measures to minimize risks, and ensure material	42	Risks (Annual report)		Number of sustainability self-assessments (entity specific) 8,725	127	Processess to remediate negative						
		6		A large variety of materials and substances are used in our products,	50	Responsible operations		Number of external sustainability audits executed (entity specific) 92	128	Actions and metrics						
		7		We encourage our suppliers to use the industry substance management	50	Responsible operations		Create and maintain material invento- ries as basis for further eco-design as-	81	Actions and metrics						
		8		We're shaking up energy's purchasing world by working together with	6	Foreword (Sustainability report)		For fiscal year 2025, our target was to cover 55% of the aggregate Sustainability Risk Score for the	129	Targets						
		9		Based on risk sources identified by the EU, which cover armed conflicts, weak governance and	56	Respect for human rights (Annual report)		The materials most commonly present in our waste streams include:	82	Resource inflows						
		10		Eco-design To enhance the circularity of our products from the outset and ensure compliance	50	Responsible operations		Life cycle assessments are conducted to quantify the environmental impacts of our products across	78	Impacts, risks and opportunities						