Sustainable Mineral Sourcing

Understanding corporate practices of stakeholder engagement and mineral supply chain due diligence in the Electronics Industry.

Richard Evans
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Utrecht University
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Research on understanding practices of stakeholder engagement and mineral supply chain due diligence in the Electronics Industry.

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Richard Charles Olson Evans
5834171
r.c.o.evans@stucents.uu.nl

Utrecht University
Faculty of Geosciences

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I certify that this dissertation is entirely my work and no part of it has been submitted for an alternative degree or other qualification in this or another institution. I also certify that I have not collected data nor shared data with another candidate at Utrecht University or elsewhere without specific authorisation.

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List of abbreviations

3T(G) – Tin, Tantalum, Tungsten, (and Gold) largely mined from sites in eastern Congo
ASM – Artisanal and small-scale mining
BSP – Better Sourcing Program
CMRT – Conflict mineral reporting template (developed by the RMI)
CSO – Civil Society Organisation (generally have a local/regional focus)
CSR – Corporate Social Responsibility
DRC – The Democratic Republic of the Congo
EU – European Union
GeSI – Global e-Sustainability Initiative
GRI – Global Reporting Initiative
GVC – Global Value Chain
HIIK – Heidelberg Institute for International Conflict Research
ICCPR – International Covenant on Economic, Social and Cultural Rights
ICESCR – International Covenant on Civil and Political Rights
ICGLR – International Conference on the Great Lakes Region
ILO – International Labour Organisation
ITRI – International Tin Research Initiative
iTSCi – ITRI Tin Supply Chain Initiative
LBMA – London Bullion Market Association
LME – London Metal Exchange
LSM – Large-scale mining
MNC – Multi-national Company
MNEs – Multi-national Enterprises
NGO – Non-governmental Organisation (generally national/international focus)
OECD – Organisation for Economic Co-operation and Development
PPA – Public-Private Alliance for Responsible Minerals Trade
PPP – People, Planet, Prosperity (framework for sustainability)
RBA – Responsible Business Alliance (formerly Electronics Industry Citizenship Coalition)
RJC – Responsible Jewellery Association
RMAP - Responsible Minerals Assurance Process (formerly Conflict-Free Smelter Program)
RMI – Responsible Minerals Initiative (formerly Conflict-Free Smelter Initiative)
ROCI – Reasonable country of origin inquiry
SDGs – Sustainable Development Goals
SEC – US Securities and Exchange Commission
SOR – Smelter(s) and/or Refiner(s)
SSCM – Sustainable Supply Chain Management
UDHR – Universal Declaration of Human Rights
UN – United Nations
UNGPs – United National Guiding Principles (on Business and Human Rights)
UK – United Kingdom
US – United States (of America)

Foreword

A wide range of minerals are used to perform vital functions in the consumer electronics that we are dependent on in contemporary society. These minerals are extracted, processed, smelted and used to manufacture electronic goods through a highly complex global value chain. The convoluted system of actors and exchanges within this creates unique challenges in tracing minerals to their source, inhibiting the governance of sustainability across the various tiers of the value chain. In this thesis, current literature is reviewed to investigate the structure (i.e. actors) and composition (i.e. policy instruments) of sustainable and responsible mineral sourcing efforts. Theoretical literature is also assessed to develop a conceptual framework for analysing the level of governance effectiveness in terms of sustainability, focusing on downstream electronics companies due to their responsibility and leading role in managing actors and sustainability across the mineral value chain. Conclusions highlight that despite progress within the electronics industry, there is considerable variation between companies when implementing policies for sustainable mineral sourcing. This thesis makes recommendations based on how policies can be more effectively implemented and emphasises critical policy areas where companies can maximise sustainability outcomes.

Summary

Consumer electronics are used by billions of people across the globe and have become ubiquitous within all aspects of contemporary lifestyles, culture, economy, industry, military and government. Yet, the way that electronic devices are produced, consumed and disposed of remain relatively hidden from consumers. Consequently, we tend to have little knowledge about how these electronic devices work, how they are made, or their impact on sustainability. Minerals, in particular, are generally invisible within electronic devices but have a wide range of key electronic functions, this helps make the electronics industry among the largest industrial end-users of minerals. However, increasing demand for electronics and the minerals they require is reflected in a growing list of negative social, political, economic and environmental impacts in countries where these minerals are mined, processed, smelted and used for manufacturing electronics components (Overeem, 2009; The Enough Project, 2010; Young *et al.*, 2010). This includes occupational concerns like exploitation, unsafe working conditions, forced or child labour; environmental concerns leading to the pollution or destruction of the environment; as well as the consequences of these on local communities and biodiversity (Resolve, 2010; Young, 2018).

Growing awareness of these mineral-related sustainability risks among electronics companies and governments has resulted in a growing number of initiatives, frameworks and policies focusing on responsible mineral sourcing and more sustainable mining. Addressing the human rights abuses and violence associated with conflict minerals has gained especially strong traction in the public domain, highlighting links between the small-scale mining of valuable minerals such as tin, tantalum, tungsten, and gold (collectively 3TG) and on-going civil war in mineral-rich areas like the Democratic Republic of the Congo. For example, widely recognised frameworks such as the 'OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected Areas' outline principles for sustainable mineral sourcing. Such frameworks focus on the responsibility of downstream companies to manage sustainability within their supply chain, especially electronics brands due to their role as mineral end-users and leverage over supplies. Although, governments and civil society organisations also have a role in overseeing and enforcing corporate implementation of sustainability frameworks.

Yet, governing these risks remains challenging due to the convoluted nature of mineral supply chains, which are made up of complex relationships and transactions between globally dispersed actors. This acts to obscure upstream sustainability risks from downstream electronics companies and consumers, undermining public and private sector efforts to manage or enforce sustainability standards. Such challenges demonstrate how the incorporation of supply chain actors and broader stakeholders into mineral due diligence efforts among corporations is important for sustainability governance. By engaging meaningfully with relevant stakeholders, downstream companies can benefit from the additional resources or knowledge they provide to more effectively implement due diligence measures. In doing so, these companies can work collectively to identify and manage upstream sustainability risks relating to minerals (Krick et al., 2005; Fassin, 2009; Taylor and Bancilhon, 2019). Various frameworks have evolved to help direct stakeholder engagement practices and improve sustainability performance among companies and to assist supply chain due diligence. For example, the 'Stakeholder Engagement in Human Rights Due Diligence' guide published by the Global Compact Network Germany (GCNG), as well as the OECD's 'Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractives Sector'.

Using stakeholder engagement and due diligence frameworks along with theoretical literature, this thesis develops a conceptual framework outlining how and when electronics companies should engage with stakeholders within the mineral due diligence process. This focuses on how meaningful engagement can be designed and implemented within mineral due diligence via corporate policy outputs (e.g. regulations, tools, instruments etc.). Using data from corporate reports and interviews, a sample of 30 case study companies from the electronics industry are evaluated based on an assessment framework derived from the theoretical literature. The purpose of which is to analyse and compare how these companies implement due diligence in mineral supply chains, as well as how they plan, conduct and respond to stakeholder engagement. In doing so, this enables the identification of areas where poorly performing case study companies should improve the implementation of key policies, as well as highlighting the best practices used by leading case study companies. Part of this research also highlights the overall sustainability impact of each key policy output, emphasising critical areas where companies can maximise sustainability outcomes.

Overall, research shows that the sample of 35 electronics companies all have well-developed policies for mineral due diligence and stakeholder engagement, showing that sustainable mineral sourcing has become established under the broader remit of CSR and corporate sustainability. Despite this, the case studies have adopted different approaches for applying these policies, with a range of consequences for sustainability within the mineral value chain. Evaluating corporate practices against recommended policy outputs in the assessment framework makes this particularly evident, highlighting the spectrum in how effectively due diligence and stakeholder engagement are implemented. Yet, this thesis concludes by highlighting various policy recommendations for the electronics industry based on this analysis, emphasising critical areas where electronics companies can improve the implementation of these 12 key policy outputs and maximise sustainability outcomes within mineral governance.

1. Introduction

1.1 Problem Definition: sustainability risks in mineral supply chains

The rapid growth of the consumer electronics industry since the 1980s is archetypical of a technology-focused and globalised economy, in which consumer electronic goods like televisions, phones, computers and tablets are increasingly integral to contemporary society (The Enough Project, 2010; Evans and Vermeulen, 2020). Electronics brands dominate this industry and control a complex network of suppliers, who source, manufacture, and assemble electronics and their components (Raj-Reichert, 2011). However, increasing demand for electronics is reflected in negative social, political, economic and environmental consequences in countries where manufacturing and raw material extraction take place (Overeem, 2009; The Enough Project, 2010; Young *et al.*, 2010; Evans and Vermeulen, 2020). This includes occupational concerns like exploitation, unsafe working conditions, forced or child labour; environmental concerns leading to the pollution or destruction of the environment; as well as the consequences of these on local communities and biodiversity (Resolve, 2010; Young, 2018).

One area of particular concern is the growing negative sustainability impacts associated with the extraction and trading of minerals, as shown in *Figure 1*. These risks primarily occur in developing countries, in part caused by weak public institutions and limited state authority (Hofmann *et al.*, 2015; Jameson *et al.*, 2016). Worryingly, research also shows a link between mining and cases of human rights abuse and even violent conflict in some countries (i.e. Global Witness 2009; Prendergast and Lezhnev 2009). For example, minerals such as tin, tantalum, tungsten, and gold (collectively 3TG) are at the heart of disputes in mineral-rich areas like the Democratic Republic of the Congo (DRC). These 'conflict minerals' are illegally taxed and/or sold by armed groups to finance conflict which is at the heart of the humanitarian crisis in central Africa (Resolve, 2010; Evermann, 2014; Young, 2018). Due to the application of minerals in electronic devices (see *Appendix 2* for minerals used in electronics and their function), it is vital to critically assess how our consumption of electronics impacts development, human rights and environmental protection in mining areas globally (The Enough Project, 2010; Amnesty International, 2016; Jameson *et al.*, 2016; Callaway, 2018; Young, 2018).

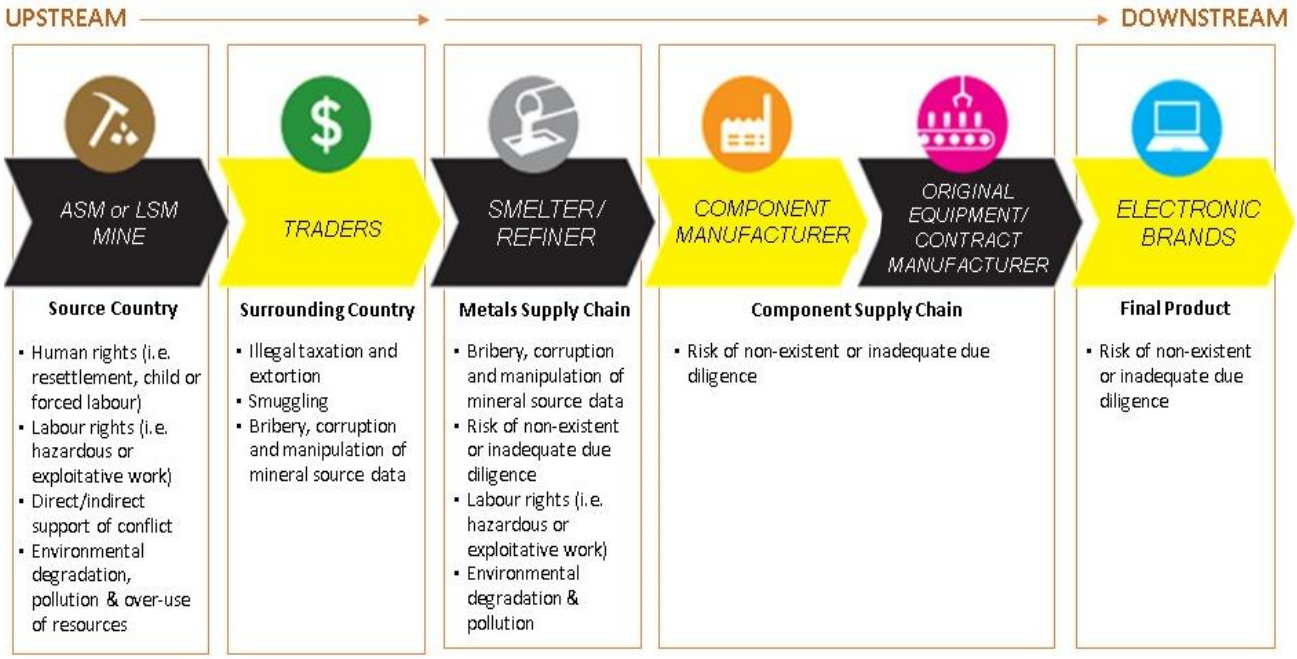


Figure 1: Graphical depiction of potential mineral related sustainability risks in the electronic global value chain. For a full list see Appendix 1 (Adapted from: OECD, 2013b; Amnesty International, 2016).

Sustainability risks can be attributed to the challenges of governing sustainability in global supply chains, which fragment and disconnect the various stages of the mineral lifecycle across international borders (Evermann, 2014; Hofmann *et al.*, 2015; Evans and Vermeulen, 2020). In this context, the global value chain (GVC) framework conceptualises the nexus of actors and transactions through which minerals are extracted, processed, smelted and used to manufacture electronic goods (Raj-Reichert, 2011; Evans and Vermeulen, 2020). *Figure 1* depicts this mineral value chain and highlights the sustainability risks linked to the 'upstream' supply chain, as well as the various tiers of 'downstream' actors which smelt ore and use the resulting metals to manufacture and assemble components for electronic products. These final products are then sold by brand companies to retailers or directly into consumer markets.

Within this system, sustainability governance is undermined by the characteristics of international trade, whereby supplier/buyer information relating to mineral exchanges often lacks accuracy, transparency or consistency (Hofmann *et al*., 2015; Amnesty International, 2016; Jameson *et al*., 2016; Young, 2018). The smelting of minerals from a wide catchment area exacerbates this by amalgamating minerals from various pipelines, making it difficult to trace minerals to their separate sources and differentiate those associated with sustainability risks. Consequently, illegally produced or unsustainable minerals can enter the global market, while the upstream conditions under which these minerals are extracted become obscured from downstream companies and consumers (Young *et al*., 2010). Resulting in the non-allocation of accountability among actors that contribute to (directly or indirectly) unsustainable practices (Prenkert, 2014; Hofmann *et al*., 2015; Martin-Ortega *et al*., 2015; Jameson *et al*., 2016; Sydow and Reichwein, 2018).

1.2 Social Context: managing sustainability risks in mineral supply chains

In this setting, sustainability science aims to elucidate the dynamic relationships between social and ecological systems, for example between resource systems and users (de Vries, 2013). The purpose of this is to study the impacts of human-induced changes on the environment and development, as well as the sustainable management of these impacts through systems of governance (de Vries, 2013). Here, governance can be understood as the arrangement of, and interactions between, various actors, institutions and policy instruments[1] (Driessen *et al.*, 2012). However, the arena in which governance takes place is dynamic and complex; governance modes can co-exist and interact in various ways and at various scales (Abbott and Snidal, 2009). Therefore, in the analysis of environmental governance and its effectiveness, Driessen *et al*. (2012) recommend systematic investigation of governance structure (i.e. actors) and composition (i.e. policy instruments).

Considering this, various forms of governance have emerged to manage sustainability risks in the mineral value chain. This makes up a multi-faceted landscape containing various standards and legal frameworks, enforced by a range of public and private institutions (Abbott and Snidal, 2009; Evans and Vermeulen, 2020). However, there remains a problem whereby globalization allows downstream companies to buy, use, and sell unsustainable minerals (or products containing them) without traceability or accountability for negative upstream impacts (Prenkert, 2014; Hofmann *et al.*, 2015). Gaps in the governance of minerals allow this to happen, stemming from a disconnect between legal frameworks for mineral sustainability and corporate social responsibility (CSR) (Distelhorst *et al.*, 2015). Here, weak or corrupt regulatory institutions in mineral source countries undermine official checks, control and legislation of raw materials, particularly concerning informal and small-scale mining. Thus, facilitating the supply of unsustainable and poorly traceable minerals to the global market (Distelhorst *et al.*, 2015; Jameson *et al.*, 2016). Moreover, assigning responsibility for sustainability risks through regulation is also challenging, given the various actors in the electronics GVC and their differing roles and connections to negative upstream impacts. Mineral regulation is further undermined by inconsistent agendas between nations across the GVC and the cross-border smuggling of illegal minerals out of conflict areas (Hofmann *et al.*, 2015; Jameson *et al.*, 2016).

[1] I.e. regulations (voluntary or legal), standards, codes of conduct etc.

However, where public policy gaps exist, private sustainability governance plays a role in addressing risks associated with mineral sourcing. As part of this, some electronics brands and other downstream multinational companies (MNCs) are starting to adopt voluntary measures for identifying and managing upstream sustainability risks. This tends to involve using supply chain due diligence techniques to map upstream mineral transactions back to the source and using this to enforce sustainability standards among global suppliers (Distelhorst *et al.*, 2015). To promote mineral due diligence, industry associations like the Responsible Business Alliance (RBA) have developed industry-wide codes of conduct and management programmes. This aims to provide tools and information sharing platforms to support responsible mineral sourcing and regulatory compliance (Resolve, 2010). Despite this, sustainability performance varies between companies in the electronics industry. The complexity and competitive nature of the mineral value chain also mean that many downstream MNCs lack motivation or knowledge to build communication channels with distant upstream suppliers (Resolve, 2010; Young *et al.*, 2010; OECD, 2013a). This lack of transparency also reduces consumer awareness and incentives for MNCs to take responsibility for sustainability issues far up the mineral value chain (Evermann, 2014).

Consequently, mineral governance takes place in an environment where it is difficult to enforce national or international sustainability frameworks, particularly in politically unstable and mineral-rich areas. Furthermore, many electronics MNCs do not take full advantage of the opportunities to invest their considerable resources into increasing transparency across the mineral value chain, as well as leveraging change among suppliers. Therefore, some mines in developing nations have become 'grey-areas' for sustainability, contributing to the sustainability risks shown in *Figure 1* (Jameson *et al*. 2016; Partzsch and Vlaskamp 2016; Hofmann *et al*. 2015; Prenkert 2014).

1.3 Paradigm Shift: top-down to multi-stakeholder mineral governance

While governments and MNCs have traditionally focused on top-down approaches to environmental governance, during recent decades the social structure in which governance takes place has diversified. For example, within the electronics industry, globalisation and an expanding sustainability agenda have resulted in the emergence of new actors, networks (institutions) and policy outputs within sustainability governance (Evans and Vermeulen, 2020). The growing diversity of perspectives, knowledge and resources available, as well as the need for societal responses to complex sustainability problems, has resulted in a shift towards increasingly decentralised and multi-stakeholder governance approaches (Krick *et al.*, 2005; Abbott and Snidal, 2009; Driessen *et al.*, 2012). As a consequence, relationships between governments, companies, and civil society organisations (CSOs)[2] have received increasing attention in sustainability science, focusing on conceptualising 'new' forms of governance (Abbott and Snidal, 2009; Driessen *et al.*, 2012; Evans and Vermeulen, 2020). With this in mind, increasingly authors have argued that socially inclusive and complementary forms of multi-stakeholder governance are needed for effective long-term solutions to the entrenched political, economic, social and environmental issues associated with minerals (Prenkert, 2014; Distelhorst *et al.*, 2015; Evans and Vermeulen, 2020). Various regulatory frameworks have also emerged in the last decade to manage mineral sustainability risks, constituting part of a transition to a 'new accountability norm' (Prenkert, 2014). These frameworks address a range of mineral sustainability concerns and are championed by varying arrangements of government, industry and civil society representative. However, the Organisation for Economic Cooperation and Development (OECD) has established a set of universal principles for responsible mineral supply chains which are internationally agreed and widely recognised. This framework incorporates public and private actors alike in the '*OECD Due Diligence Guidance for Responsible supply chains of Minerals from Conflict-Affected and High-Risk Areas*'[3] (2011).

The Due Diligence Guidance provides a five-step, risk-based due diligence framework for companies handling minerals at any point in the GVC. The OECD outline that downstream companies, in particular mineral

[2] For the purposes of this study CSOs will be used to refer to non-profit and non-governmental organisations (NGO) that operate on local, national and international scales, making the terms NGO and CSO are interchangeable.

[3] Henceforth abbreviated to as the '*Due Diligence Guidance*' .

end-users like electronic brand companies, have the moral responsibility to investigate and publicly report on the use of high-risk or conflict minerals in the supply chain (OECD, 2013b). As part of this, downstream companies are expected to identify links to smelters or refiners (SORs), which occupy a strategic point for consolidating minerals (often referred to as the midstream). As a result, SORs occupy the best position in the GVC for understanding mineral origins as this cannot be determined once raw ores from various sources are amalgamated in the smelting process (The Enough Project, 2010; OECD, 2013a; Amnesty International, 2016). Upstream companies should also participate by collecting information and verifying the movement of minerals in high-risk areas (OECD, 2013b). As *Figure 2* shows, information collection and sharing across various tiers in the mineral value chain is vital for establishing a chain of custody. Here, transparency requires as well as promotes communication and cooperation between supply chain actors, leading to shared responsibility and accountability for upstream sustainability risks (Distelhorst *et al.*, 2015; Jameson *et al.*, 2016). Also, this allows downstream MNCs to leverage their purchasing power and other market forces to affect changes regarding mineral sustainability standards among their direct or indirect suppliers (Distelhorst *et al.*, 2015; Jameson *et al.*, 2016; Young, 2018). Within this, the OECD stress it is vital to for companies to "constructively engage, as appropriate, with relevant stakeholders with a view to progressively eliminating the adverse [sustainability] impacts" (OECD, 2013b, p. 45).

Figure 2: Framework for responsible mineral sourcing based on the OECD Due Diligence Guidance for Responsible supply Chains of Minerals from Conflict-Affected Areas. Dotted arrows indicate engagement between actors (Adapted from: OECD, 2013b; Global Witness, 2015)

Additionally, engagement with non-supply chain stakeholders is important for developing and promoting due diligence efforts among individual companies. This may include internal engagement with employees or senior staff to coordinate due diligence and allocate resources; engagement with adversely affected stakeholders to understand mineral sourcing impacts and risks; as well as engagement with government, industry and civil society stakeholders to increase legitimacy or facilitate positive socio-economic impacts on-the-ground. Various industry initiatives exist for this purpose, for example, the RBA operates initiatives and working groups to simplify due diligence by sharing information, best practices and tools with companies across the supply chain (Deberdt and Jurewicz, 2018; Young, 2018). In addition, a range of programs supports upstream actors in high-risk areas to identify and certify responsibly sourced minerals and their chain of custody, such as the Conflict-Free Gold and Tin Initiatives (Young 2018). Furthermore, participating in multi-stakeholder initiatives with state and CSOs can facilitate cooperation with stakeholders on-the-ground, including ASM miners, community organisations, regional government and other local CSOs. Which can support the identification and remedy of upstream sustainability risks in hard-to-reach mining areas (Jameson *et al.*, 2016; Kate, 2016).

1.3.1 Stakeholder Engagement

The incorporation of supply chain actors and broader stakeholders in mineral due diligence demonstrates how stakeholder engagement has emerged as an important tool for conducting and enhancing mineral due diligence. This responsibility primarily falls on downstream companies, especially electronics brands, given their role in diving mineral demand as end-users, their responsibility to inform customers and shareholders of potential risks related to electronic products, as well as their considerable resources and leverage to do so (i.e. capital, human resources, existing supply chain relationships). Therefore, it is important that these companies engage with and support actors within the mineral value chain, many of which lack resources or knowledge to conduct thorough due diligence themselves. By doing so, these companies can work collectively to more effectively identify and manage upstream risks (Krick *et al.*, 2005; Fassin, 2009; Taylor and Bancilhon, 2019).

However, responsible mineral sourcing is an iterative process and is conducted within complex and dynamic supply chains. Consequently, frequent and ongoing engagement with various stakeholders at various tiers in the mineral value chain is a vital qualification for effective due diligence (Shift, 2013; OECD, 2016). Highlighting that more transparent, proactive and meaningful approaches to stakeholder engagement underpin sustainable mineral governance (GCNG, 2014). In fact, by collaborating and building relationships with stakeholders, downstream MNCs can improve their knowledge, ability and legitimacy when undertaking mineral due diligence (The Enough Project, 2010; OECD, 2013b; Shift, 2013; Jameson *et al.*, 2016).

1.3.2 Governing Mineral Due Diligence

The importance of stakeholder engagement in responsible mineral sourcing reflects growing public and political pressure on MNCs over last decade, particularly the responsibility and role of downstream MNCs in addressing extraterritorial impacts in countries with weak human rights or environmental protections. In part, this is driven by academic and media attention on the issue of conflict minerals, which has motivated industry and government policy-makers to develop regulations preventing domestic companies from violating international sustainability standards (Jameson *et al.*, 2016; Sydow and Reichwein, 2018). This aims to address sustainability risks where in areas where minerals are sourced, used to manufacture electronic components, and/or consumed (Amnesty International, 2016). The Due Diligence Guidance, which is voluntary and non-binding in itself, has been broadly adopted by public and private policy-makers as a credible standard for responsible mineral sourcing (Sydow and Reichwein, 2018). Forming a core part of a complex architecture for mineral governance focusing on due diligence which has emerged and evolved in the last decade.

Despite growing regulation focusing on mineral due diligence, recent changes in political momentum for CSR (particularly in the US) has called into question the extent to which these policies will be enforced (Deberdt and Jurewicz, 2018). Prompting a decline in corporate due diligence efforts and highlighting the lack of long-term commitment to sustainability programs within many MNCs, especially among companies less vulnerable to public criticism or those unwilling (or unable) to invest time and resources into CSR (Morrison and Vermijs, 2011; Deberdt and Jurewicz, 2018). Effective stakeholder engagement also remains a challenge because of its context-specific and vague nature, particularly for MNCs lacking experience or support (Baccaro and Mele, 2011; Shift, 2013; Sanchez, 2015). As a result, Baccaro and Mele (2011) argue that there is “no evidence this [multi-stakeholder approach] is more effective than traditional forms of governance” (p.452), pointing out that the complexity of the GVC can limit the value and feasibility of successful engagement between numerous actors. Furthermore, mineral transparency initiatives have been criticised for unintentionally creating a *de facto* ban on raw materials from certain regions (i.e. central Africa), undermining social and economic opportunities related to legitimate mining (Seay, 2012; Jameson *et al.*, 2016). These initiatives are also linked to an increase in unrecorded and fraudulent trading of minerals as ‘black-listed’ producers seek ways to remain in business (Resolution Possible, no date b). As a result, there remains no clear way for consumers to know whether electronic devices contain unsustainable minerals, combined with a lack of effective long-term initiatives within the electronics industry to address upstream sustainability risks (The Enough Project, 2010). On-top-of-this, it is not clear if mineral transparency initiatives are simply adding to the complex and incoherent landscape of mineral governance, making it difficult to determine the effectiveness of current due diligence approaches.

1.4 Research Objective and Relevance

The unique and complex challenges within the mineral value chain are putting pressure on sustainability governance, which has so far had varying degrees of success in addressing sustainability risks associated with minerals. However, mineral due diligence is a recent and evolving technique for enhancing mineral traceability. Here, engagement between actors across the mineral value chain is fundamental for the effective identification, management and remedy of upstream sustainability risks. Yet, despite its importance in the long-term sustainability of consumer electronics, few studies critically assess the role of stakeholder engagement and how it is applied to address sustainability risks as part of mineral due diligence. Even in this field, due diligence tends to be viewed through the lens of international law (Saner and Yu 2014) or political science (De Schutter *et al.*, 2012; Partzsch and Vlaskamp, 2016). There are also studies which narrowly view due diligence from a business management perspective (Taylor *et al.*, 2009; Morrison and Vermijs, 2011), or conduct broad reviews of due diligence practices (Fasterling and Demuijnck, 2013; Scheper, 2015).

Moreover, knowledge gaps also blanket the Due Diligence Guidance itself, which has not been thoroughly evaluated regarding its implementation and best practices, at least by researchers outside of the OECD (Deberdt and Jurewicz, 2018). Prenkert (2014) also argues that the concept of multi-stakeholder governance of conflict minerals has "not been adequately explored in the literature addressing business and human rights" (p.224). This is echoed by (Hofmann *et al.*, 2015), who highlight that collaborative approaches to due diligence have been overlooked in the literature. As such, there is a need for empirical evidence highlighting how due diligence is applied by downstream electronics MNCs in practice. This falls into a wider knowledge gap regarding how to develop effective mineral governance systems based on best practices in the electronics industry, as well as the corporate factors (internal and external) which influence due diligence performance.

Examining governance can serve as a tool for diagnostic and prescriptive inquiry and, as demonstrated by Evans and Vermeulen (2020), it is possible to analyse comparative forms of sustainability governance and the variables that contribute to successful (i.e. effective) solutions to sustainability dilemmas. In this setting Driessen et al. (2012) argue that studying governance, and its specific features, is vital to understand successful outcomes (in terms of sustainability). Therefore, this thesis seeks to investigate mineral due diligence by identifying and comparing how electronics brands plan, conduct and respond to stakeholder engagement. This will be used to determine successful engagement practices and the factors at the corporate-level which influence this success. In doing so, this research will add to the Due Diligence Guidance, aiming to provide clear and specific recommendations on stakeholder engagement strategies which maximise sustainability performance. This research will also contribute to the emerging literature on multi-stakeholder governance and responsible mineral sourcing (Baccaro and Mele, 2011; Prenkert, 2014; Hofmann *et al.*, 2015).

1.5 Research Questions

Considering this, the following research questions have been created to guide analysis:

1. How do electronics brands conduct stakeholder engagement as part of due diligence in the mineral global value chain; and what practices/recommendations can be identified to support successful stakeholder engagement?

2. How can lessons learnt regarding successful due diligence within the electronics sector, be applied to mineral governance in the global value chain?

Sub-questions

A. *How do different electronics brands conduct stakeholder engagement within corporate due diligence?*
B. *To what extent do different brands conduct successful stakeholder engagement within supply chain due diligence and what best practices can be identified?*
C. *How is stakeholder engagement success influenced by variables at the corporate-level (internal and external) and how can these be limited?*
D. *What critical perspectives on stakeholder engagement and governance can be sourced from the literature and examples in the electronics, as well as other, industries?*

1.6 Research Framework

The research framework (shown in *Figure 3*) describes the systematic analytical processes or steps used to answer the research questions in Section 1.5, which will be further explained in this section.

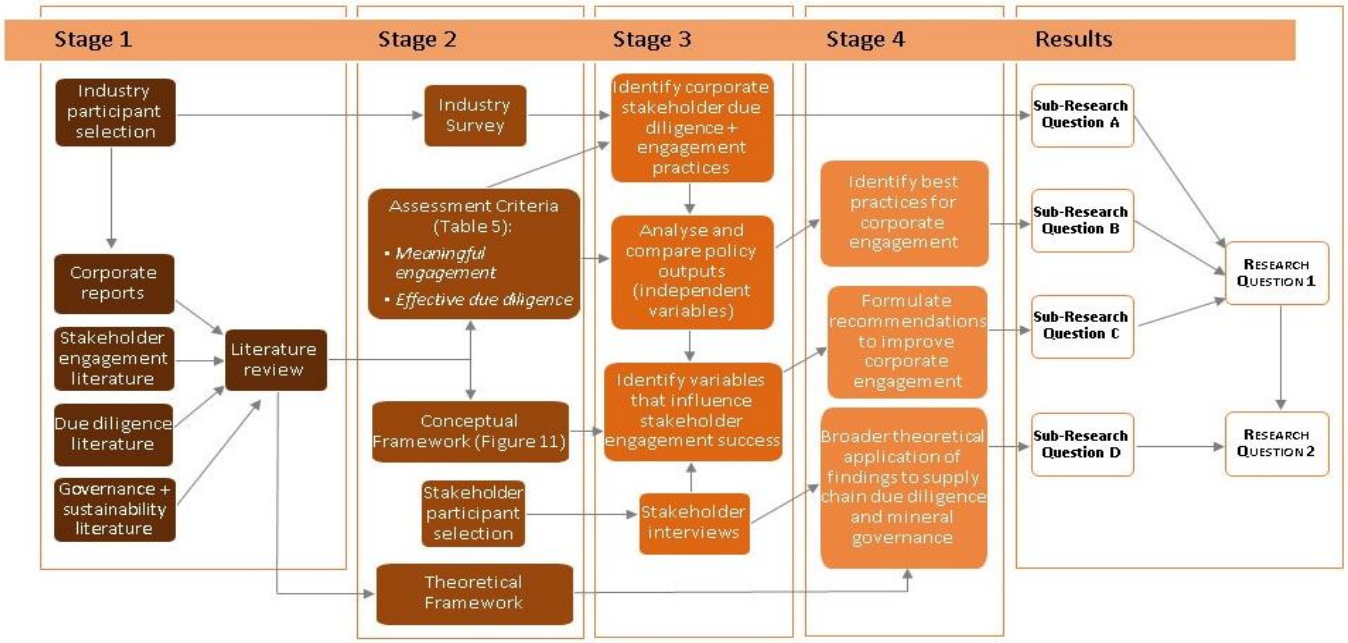


Figure 3: Research Framework

Firstly, a broad literature review will be conducted to examine governance and sustainability theory that constitutes the research problem at the heart of this study (theoretical framework), in this case, unsustainable mineral extraction and the complex governance landscape in which minerals are sourced. To conceptualise how such problems can be addressed via due diligence and stakeholder engagement an additional literature review is conducted (conceptual framework). This is used to establish the causal relationships between stakeholder engagement and sustainable mineral supply chains (shown in *Figure 13*), as well as to develop assessment criteria for these established concepts (shown in *Table 5*). Corporate literature will also be analysed to examine stakeholder engagement and due diligence practices among brand companies within the electronics industry[4]. This will involve identifying corporate policy outputs (independent variables) within each electronics MNC under investigation, emphasising outputs such as regulations, tools, plans with which engagement and due diligence are implemented (answering ***sub-question A***). By assessing corporate engagement policies and practices against the assessment framework, research will aim to compare engagement approaches between companies and analyse how they influence overall sustainability in mineral supply chains (dependent variable)[5]. In doing so, the proposed research will identify best practices in the industry regarding engagement (answering ***sub-question B***).

Furthermore, research into corporate engagement will be used with theoretical literature to analyse the corporate-level factors (internal and external) that influence corporate policy outputs, outcomes, and engagement success (answering ***sub-question C***). This will be used to understand how different MNCs compare regarding their management of stakeholder engagement, as well as to develop recommendations for improving engagement across the electronics industry. By combining these recommendations with the conclusions on best practices regarding stakeholder engagement, this research will be used to answer ***research question 1***.

[4] For the exact selection criteria in this study used to define the companies under investigation see Section 4.2

[5] This approach is based on Driessen *et al's* (2012) conceptualisation of governance as a milieu of various actors, policy instruments, policy effects and the relations between them.

Finally, wider perspectives from government documents, CSOs and academic research will be incorporated to support research into corporate engagement practices, to develop an in-depth and critical understanding of corporate due diligence literature. This triangulation of sources will also focus on interviews with expert stakeholders, enabling increased engagement within the wider debate on sustainable supply chain governance. This will also address ***sub-question D*** and in doing so, providing an insight into how to apply lessons learnt on successful stakeholder engagement to wider supply chain governance and addressing ***research question 2***.

This thesis will use the following format to address these research questions. In Section 2, the literature on mineral sustainability risks (*2.1*) and governance mechanisms in the mineral supply chain (*2.2*) are introduced as part of the theoretical framework. In Section 3, further literature is analysed in a review of stakeholder engagement (*3.1*) and mineral due diligence (*3.2*) as part of the conceptual framework, this is followed by a summary of how these concepts work together to contribute to sustainable mineral supply chains (*3.3*). Next, the methodological approach used in this thesis is described in Section 4, this includes description of the research design (*4.1*), the case study selection criteria (*4.2*), data collection processes (*4.3*) and data analysis processes (*4.4*). In Section 5 data on corporate policies and policy outcomes are analysed, this includes an introduction to the electronic companies under investigation (*5.1*), followed by an in-depth analysis of case study mineral due diligence practices (*5.2*) and stakeholder engagement practices (*5.3*). Section 6 then discusses the overall effectiveness of mineral due diligence and stakeholder engagement practices in the context of broader literature, while the implications of these finding for state, industry and civil society stakeholders are addressed Section 7. Finally, conclusions are summarised in Section 8, along with areas for further study.

2. Theoretical Framework: governing mineral sustainability

2.1 Mineral sustainability risks

Electronics are ubiquitous within our digital society and have a wide range of applications that we are increasingly dependent on, not just for personal use but also in the operational management of infrastructure, banking, military systems, global communication, transport etc. (The Enough Project, 2010). While billions of people consume electronic technology daily, we tend to have little knowledge about how these electronic devices work, how they are made, or their impact on sustainability. This lack of understanding also applies to mineral supply chains and their role in the production of consumer electronics. Minerals have various key functions which allow electronics to operate (see *Appendix 2* for a list of minerals commonly used in electronics, as well as their function), as a result, the electronics industry has evolved into one of the largest industrial end-users of minerals.

Yet, the process of mining and producing useable forms these minerals can have damaging social, economic and environmental impacts on a range of stakeholders across the mineral value chain (see *Appendix 1* for a list of these sustainability impacts and affected stakeholders). The majority of these risks occur upstream in developing countries, meaning that they are obscured from downstream companies and consumers. Partly this because of the diversity and small quantities of minerals used in electronics, with the number and mass of each varying depending on the product, brand, and specific technologies (Young *et al.*, 2010; Sydow and Reichwein, 2018). Minerals also lose their provenance (or traceability) as they are transferred between supply chain actors in the mineral value chain. This usually consists of various processes which mix and transform minerals, including the extraction and processing mineral ore, the processing of minerals into metals by SORs, as well as the application of metals in manufacturing electronic parts (e.g. capacitors, semiconductors, batteries etc.). As shown in *Figure 4*, minerals from a single mine are widely dispersed during these processes and combined with ore or metals from different sources including recycled material (Young *et al.*, 2010). To further complicate this, each stage of production tends to take place at geographically distant loci. For example, the DRC generates around 40% of global cobalt ore (tantalum), yet most is exported to smelters in China before being sold to manufacturers globally (Amnesty International, 2017; Callaway, 2018).

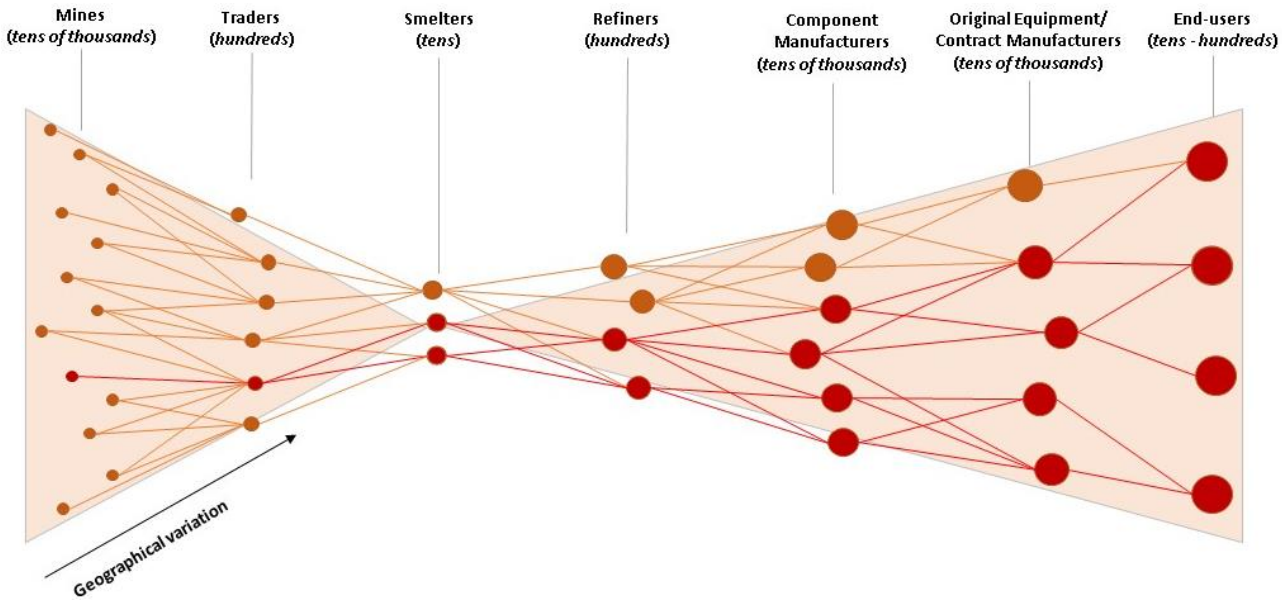


Figure 4: Model of mineral exchanges in the mineral value chain from source to end-users, representing links between supply chain actors and the proportion of actors at each tier. The geographical variation of these actors is also represented using triangles, with SORs being the least dispersed. Red connections show the potential spread of minerals from a single source with the mineral value chain (Adapted from Philips n.d.; RMI n.d.)

The overall result of this complex value chain is that minerals are difficult to trace to their upstream source, meaning that the conditions in which minerals are produced become disconnected from the devices in which they are used (Prenkert, 2014; Hofmann *et al.*, 2015). Thus, obscuring negative upstream sustainability impacts from downstream companies and consumers (Hofmann *et al.*, 2015). These negative upstream impacts occur globally and include a broad range of sustainability 'risks' (as defined in *Appendix 1*), although the impacts of mining on communities or workers are often among the most persistent and prevalent. Examples of these risks are well documented by advocacy groups and include the use of child labour for mica extraction in Madagascar (Sanne van der Wal, 2019); toxic working conditions and environmental pollution caused by tin mining in Indonesia (Milieudefensie, 2016); as well as land grabbing and indigenous rights violations in Argentina, Chile and Bolivia caused by lithium mining (Marchegiani *et al.*, 2019). The violation of land, human and labour rights in this way, without effective remedies from the government or industry, contributes to a range of socio-environmental conflicts. These are catalogued in databases like the Environmental Justice Atlas, serving as a useful tool for analysing the negative sustainability impacts of mining globally (see *Figure 5*). From this, it is possible to discern around 576 ongoing disputes caused by mining activities as of 2019. These conflict involve land repossessions and evictions, environmental damage and habitat loss, occupational health and safety violations, exploitative and discriminatory working conditions, lack of fair worker representation and freedom of association, as well as the over-use or pollution of water supplies (Temper *et al.,* 2015; Vidal, 2015).

These socio-environmental disputes are generally situated in developing countries and take place between large-scale mining (LSM) companies and local groups in mining areas (i.e. community, farming, indigenous or miners' organisations). Many of the largest mining MNCs are involved in such disputes. For example, AngloGold Ashanti, Rio Tinto, Barrick Gold, BHP Billiton, Glencore Xstrata and Newmont Mining are complicit in 75 disputes alone (Vidal, 2015). While these companies are major contributors to developing economies in terms of licence fees, taxation and employment, the number of disputes highlights a lack of transparency and accountability among mining companies for sustainability risks. This is often supported by governments and officials who create preferential mining contracts allowing for limited transparency, using this to attract critical investment from the mining industry or even illegally siphon money through corrupt business operations (Callaway, 2018). Yet in as many as 50 countries, disputes related to the unsustainable extraction of minerals involve some form of escalated

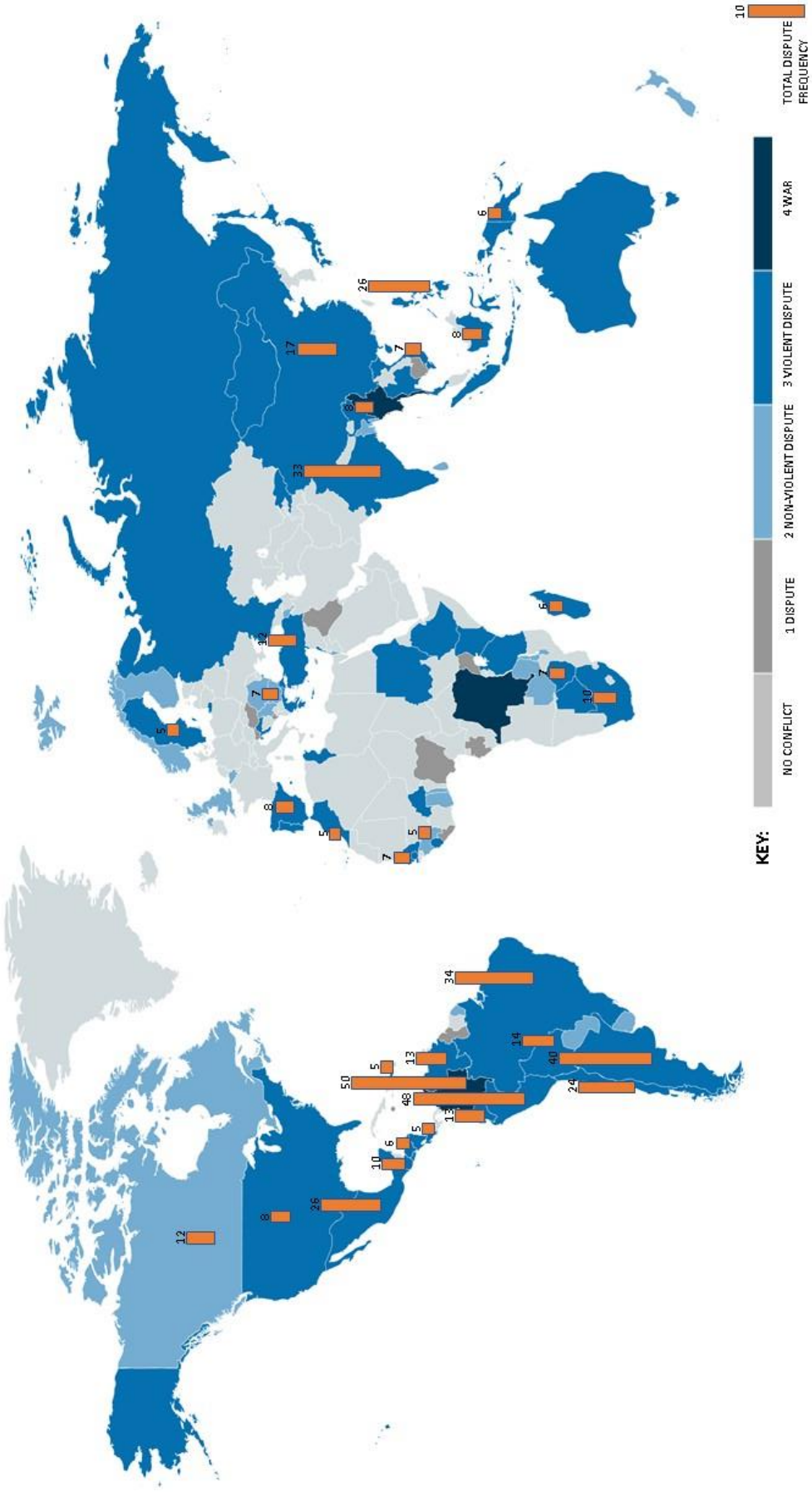


Figure 5: Map showing the number and intensity of on-going disputes related to the mining industry. Darker blue colours indicate increasing dispute intensity at a national scale. Countries that are engaged in multiple conflicts of varying intensity are represented using the highest intensity extent of the disputes. In addition, the frequency of disputes is indicated with numbered bars, proportioned to scale according to the number of disputes within each country. Frequency bars are only provided in countries 5 or more listed disputes (For dispute frequency and intensity data see Appendix 3).

violence (see *Figure 5*). This can include mass mobilisation, protest, and extremist violence among afflicted groups, as well as reactive measures from state or private security forces like arrests, aggressive dispersal tactics, even military involvement (Temper et al., 2015; Vidal, 2015). Demonstrating the entrenched nature of mining disputes in certain areas, as well as the continuing negative consequences for sustainability within the mining industry.

In addition to the role of LSM, artisanal and small-scale mining (ASM) is also a major industry for the extraction of mineral ore (Callaway, 2018). Its use of low-tech and low-cost equipment means that ASM is suited to exploiting smaller or more isolated mineral deposits, making it an easily accessible source of income in remote areas and developing countries and providing economic opportunities for up to 40 million men and women globally (Hofmann *et al.*, 2015; Amnesty International, 2016; Rustad *et al.*, 2016). Making ASM a vital source of income-generation, economic empowerment and development in many countries (Seay, 2012; Jameson *et al.*, 2016; Rustad *et al.*, 2016; Barreto *et al.*, 2018b). In the DRC alone, ASM employs around 2 million people at around 10,000 sites and indirectly supports about 15% of the country's 81 million population, primarily in Eastern DRC where deposits of 3TG, cobalt, diamonds and other precious minerals attract large numbers of migrant ASM workers (Barreto *et al.*, 2018a; Matthysen *et al.*, 2019).

Yet, ASM is plagued by a range of severe sustainability risks, including poor health and safety, occupational injury and illness, abusive forms of forced and child labour, as well as environmental damage (Hofmann *et al.*, 2015; Amnesty International, 2016; Callaway, 2018). Failure to protect artisanal miners is facilitated by ineffective and corrupt management of ASM in countries like the DRC, where mining regulations contain few provisions to protect miners' rights and authorities lack the capacity or motivation to enforce the rule of law (Hofmann *et al.*, 2015; Amnesty International, 2016; Jameson *et al.*, 2016). Furthermore, an absence of formal mining sites in areas like the DRC forces miners to work in unofficial and unregulated sites without legal protections or environmental regulation. This makes informal ASM workers particularly vulnerable to abuses like exploitation and extortion from government officials, security forces and mineral traders (Hofmann *et al.*, 2015; Amnesty International, 2016; Callaway, 2018). The migratory, informal and potentially illegal nature of ASM compound this, meaning that negative sustainability risks are generally unrecorded and improperly managed (Amnesty International, 2016). This explains the clear under-reporting of mining disputes in mineral-rich areas more dependent on ASM, for example, countries in central Africa (as shown in *Figure 5*).

2.1.1 Conflict Minerals

Moreover, minerals from 'rogue' ASM sites in the Eastern DRC have received attention due to their role in conflict across the Great Lakes region of Africa[6], a correlation demonstrated in *Figure 6* (Jameson *et al.*, 2016; Rustad *et al.*, 2016). While the conflict minerals are generally attributed to the DRC and neighbouring countries, research by the Heidelberg Institute for International Conflict Research (HIIK) suggests Myanmar and Colombia also produce 3TG associated with the worst forms of conflict – shown in *Figure 5* (Jamasine, 2017; HIIK, 2018). However, the link between conflict and minerals in these regions remains substantially less well documented in the literature, instead international focus tends to be directed towards 3TG mining in the Great Lakes region of Africa. This will be reflected in the following section on conflict minerals.

Minerals are not the only cause of insecurity in the Great Lakes region of Africa. This is an area affected by colonial legacies, as well as entrenched cultural, social, economic and political divisions (Seay, 2012; Larmer *et al.*, 2013; Prenkert, 2014; Jameson *et al.*, 2016). However, as shown in *Figure 7* the illegal interference and taxation of mining sites and/or trade routes by armed groups (i.e. rebels, militia, gangs or even the army) is linked to the financing of ongoing conflict (Prenkert, 2014; Hofmann *et al.*, 2015; Jameson *et al.*, 2016; Rustad *et al.*, 2016; Matthysen *et al.*, 2019). Illicit minerals from these mines, which are concentrated in the Eastern DRC, are also

[6] The Great Lakes Region of Africa generally refers to countries located in the Rift Valley, including Burundi, the Democratic Republic of the Congo, Kenya, Malawi, Rwanda, Tanzania and Uganda.

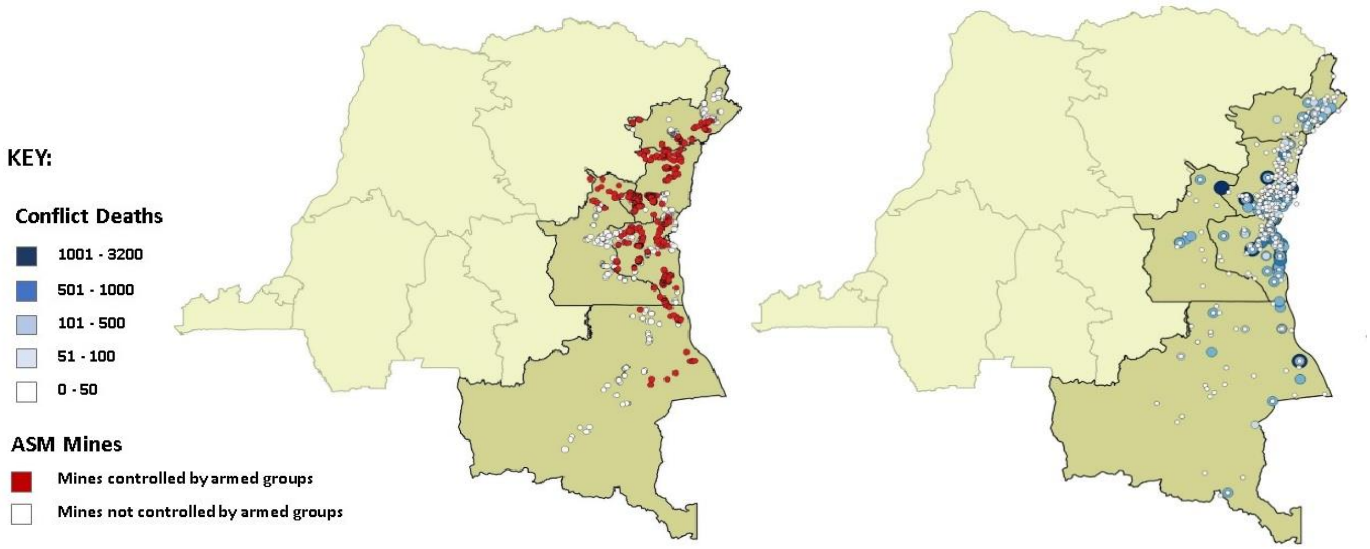


Figure 6: Maps of the DRC showing locations of ASM mines (left) and violent conflict events (right). Highlighted provinces are the main mining areas concentrated in the Eastern DRC and include Ituri, North Kivu, South Kivu, Maniema, Katanga (north to south). Dots and represented by the values in the key (Source: Rustad et al. 2016)

exported illegally to neighbouring countries via corrupt traders and smuggling routes. Allowing minerals to be sold without proof of origin into legitimate and regulated mineral streams (Global Witness, 2013; Prenkert, 2014; Amnesty International, 2016; Callaway, 2018; Young, 2018). Evidence for this is apparent in the exports of certain minerals from Uganda, Rwanda and Burundi, which exceeds domestic production and registered imports (Global Witness, 2013). In particular, minerals like 3TG (Global Witness, 2009; Prendergast and Lezhnev, 2009) and cobalt (Milieudefensie *et al.*, 2015; Amnesty International, 2016; Callaway, 2018) are linked to this illegal trade. As a result, these minerals and the metal ores from which they are derived, (e.g. cassiterite, columbite-tantalite/coltan, and wolframite) are commonly referred to as 'conflict minerals' (Prenkert, 2014; Jameson *et al.*, 2016; Young, 2018). Despite the small quantities of these minerals used in electronics, the recent growth in electronics production has increased the value of conflict minerals and made their illegal trade more lucrative (Seay, 2012; Jameson *et al.*, 2016; Amnesty International, 2017; WEED, 2019). Yet, the DRC is not the only, or even largest, supplier of 3TG (see *Appendix 2*), and the majority of these minerals are extracted and exported from the DRC via regulated channels linked to LSM. Despite this, estimates show that the value of illegal mineral trade is still in the hundreds of millions of dollars ($US) a year, reinforcing its reputation as a major source of conflict minerals (The Enough Project, 2010; Prenkert, 2014; Young, 2018).

Sustainability risks associated with conflict minerals include those of other forms of ASM, while also being associated with crimes under international, human rights and humanitarian law (Global Witness, 2014; Rustad *et al.*, 2016). The Great Lakes region is an area which has experienced several civil wars since the 1990s involving the DRC, Uganda and Rwanda, leading to the death of over 5 million people as well as cases of enslavement, sexual violence, displacement, and other atrocities reported by international organisations and CSOs on-the-ground (Seay, 2012; Prenkert, 2014; Jameson *et al.*, 2016; Rustad *et al.*, 2016; Young, 2018). As discussed, minerals are not the only cause of insecurity in this region. However, the illegal exploitation of mineral wealth in the Eastern DRC has become a dominant narrative behind instability within the Great Lakes region, reinforced by the various regimes competing to control the region's economic activities for personal wealth and/or to political power (Seay, 2012; Prenkert, 2014; Jameson *et al.*, 2016). Rustad et al. (2016) point out that the economic importance of conflict minerals makes them powerful assets for criminal and government forces alike, with control and taxation of mines and the mineral trade becoming an important motive for ongoing conflict. Typically, armed groups target ASM

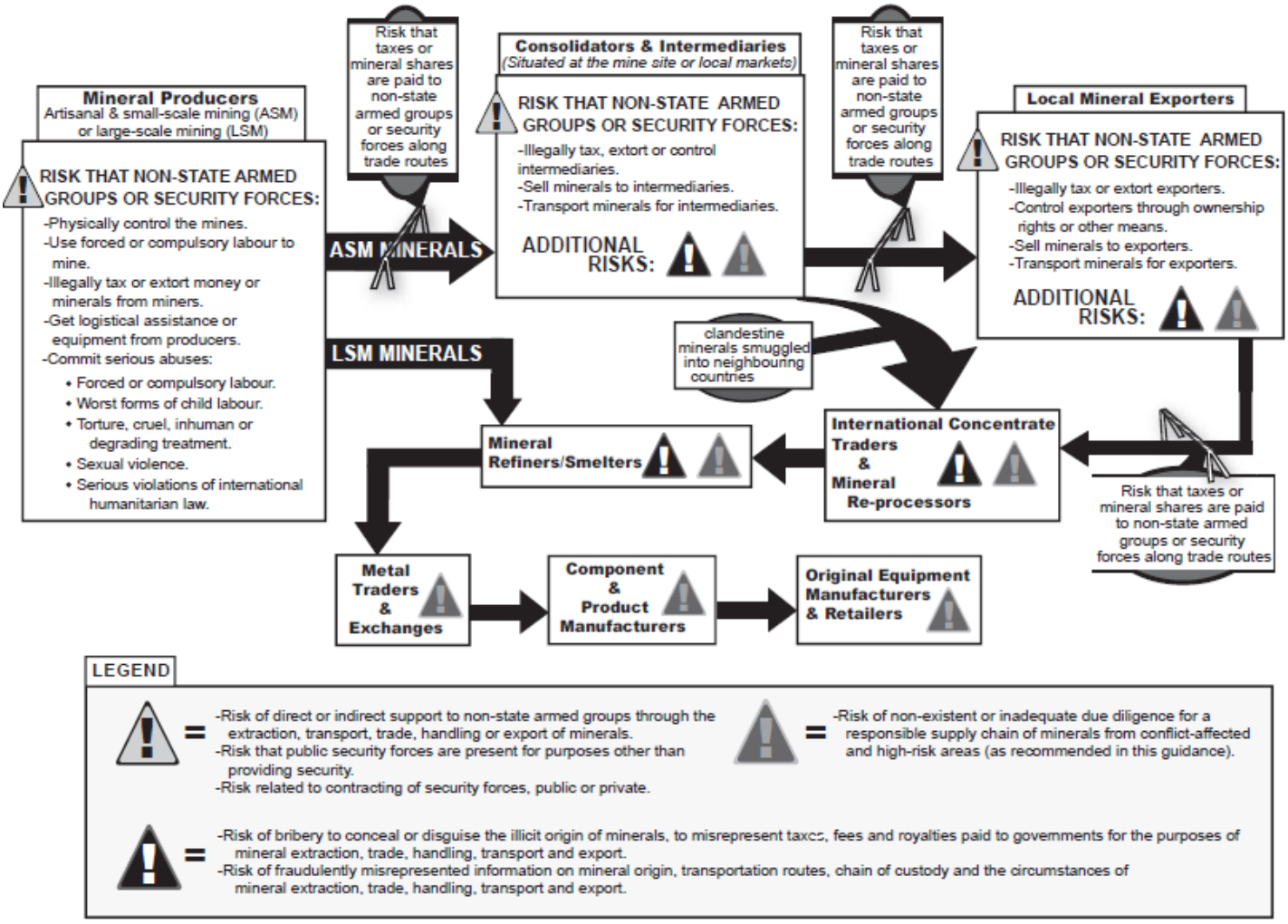


Figure 7: Actors, exchanges and risks in the supply chain of tin, tantalum and tungsten from conflict-affected and high-risk areas. For a full list of mineral risks see Appendix 1 (Source: OECD, 2013b)

activities in rural areas, which often operate outside of government regulation and protections; making it easy to extort vulnerable local mines, trade routes, and the civilian population (Rustad *et al.*, 2016). In the worst cases, physical and sexual violence is used as a tactic by rebel groups to access resource-rich areas, which often involves driving out or subjugating local civilians to maintain lawlessness and control (Prenkert, 2014; Hofmann *et al.*, 2015; Rustad *et al.*, 2016).

Despite the official cessation of conflict in the DRC since 2009, research by the HIIK shows there are still significant levels of conflict-related violence in the Great Lakes region. For example, in 2018 armed conflicts caused the displacement of an estimated 500,000 people and deaths of over 1,500 in the country (HIIK, 2018). The illegal revenues generated by armed groups in controlling mines and trade routes continue to be a central driver of ongoing political and social violence in the DRC (Hofmann *et al.*, 2015; HIIK, 2018). Leading to an understanding that the DRC is neither at war or peace but trapped in a form of 'limited war' fuelled, in part, by conflict minerals (Larmer *et al.*, 2013; Rustad *et al.*, 2016; HIIK, 2018). Similarly, this applies to other countries like Colombia and Myanmar where rebel groups target valuable mineral resources like gold, copper and tin to fuel ongoing conflict, causing deaths and widespread civilian displacement.

2.2 Governing mineral sustainability risks

2.2.1 Public Governance: in 'source countries'

There is growing evidence of the link between mineral extraction and negative sustainability risks including human rights abuses and conflict (i.e. Global Witness 2009; Prendergast and Lezhnev 2009). These risks are most prevalent in, although not restricted to, ASM in developing countries and areas of existing instability. To prevent, manage and mitigate these risks, national governments have a duty to uphold the environmental, human and civil rights of domestic citizens. Here, public institutions traditionally have a 'top-down' role in planning and implementing national policies, as well as monitoring, enforcing and redressing abuses that occur (Shift and IHRB, 2011). These responsibilities are enshrined within multi-lateral standards, such as the Universal Declaration of Human Rights (UDHR); the International Covenant on Economic, Social and Cultural Rights (ICESCR); and International Covenant on Civil and Political Rights (ICCPR) (Shift and IHRB, 2011; Amnesty International, 2016). Additional principles are included within this, such as those outlined by the International Labour Organisation (ILO) concerning access to freedom of association, collective bargaining, safe and healthy working conditions (i.e. availability of freshwater, protective equipment, emergency procedures), as well as prevention of excessive hours, forced labour, child labour and discrimination (Shift and IHRB, 2011; Hofmann *et al.*, 2015; Amnesty International, 2016).

Governments in mineral source countries must recognise these obligations and effectively regulate the mining, handling and trade of minerals within their national jurisdictions to prevent sustainability risks (Global Witness, 2013; Amnesty International, 2016; Callaway, 2018). However, corruption, instability and violence associated with high-risk areas like the DRC, Myanmar and Colombia are detrimental to state authority (as well as to the environment, human rights and development). Thus, putting additional stress on already weak public institutions which tend to lack policy coherence and/or effectiveness on both vertical and horizontal axes[7] (Resolve, 2010; Global Witness, 2013; Hofmann *et al.*, 2015; Jameson *et al.*, 2016; Young, 2018; Matthysen *et al.*, 2019). In the Great Lakes region, these structural problems are made worse by the lack of government capacity or willingness to adopt and implement regulatory measures. A range of factors can be attached to this, including limited means to enforce rule-of-law, fear of negative economic consequences on the mining industry, as well as political inertia among those who benefit from the status-quo (i.e. the political elite in the DRC and neighbouring countries) (Global Witness, 2013; Larmer *et al.*, 2013; Prenkert, 2014; Hofmann *et al.*, 2015).

Another part of the problem rests on the international trade of minerals, which by-in-large involves confidential mineral transactions between multiple tiers of suppliers and buyers (Young *et al.*, 2010). Within this, the sheer number of mineral producers represents a challenge for any system of governance, with over 10,000 ASM and LSM sites in the DRC alone (Young, 2018). Moreover, minerals are generally traded based on quality, form or price with no specific obligation for traders to report or disclose their exact origins (Young *et al.*, 2010; Amnesty International, 2017). Thus, obscuring the chain of custody between actors in the mineral value chain and concealing information regarding the upstream conditions from which minerals originate. Highlighting how the globalised nature of international trade creates gaps in the governance of mineral sustainability. These gaps allow illicit minerals to enter the global market through legal channels, while also resulting in the non-allocation of responsibility due to jurisdictional fragmentation and challenges of extraterritorial regulation in the global mineral market (Prenkert, 2014; Hofmann *et al.*, 2015).

2.2.2 Public Governance: intergovernmental organisations

Consequently, it would be short-sighted to expect a long-term solution from governments in mineral source countries alone, especially those besieged by severe internal political and social divisions (Larmer *et al.*, 2013; Prenkert, 2014). However, in light of increasing globalisation and evidence of its negative impacts in

[7] Vertical incoherence occurs when a state adopts a human rights obligation but fails to give sufficient regard or effort to its implementation. Horizontal incoherence occurs when states regulate one area in isolation (e.g., securities regulation or labour) with little regard for how that interacts with or effects regulatory efforts elsewhere (Ruggie 2009, in Prenkert 2014).

developing countries, public concerns have emerged regarding the lack of state jurisdiction where business activity has an extraterritorial dimension (Prenkert, 2014; Jameson *et al.*, 2016). In part, this stems from the absence of comprehensive obligations aimed at making state and corporate actors in downstream consumer markets accountable for upstream sustainability risks in foreign countries. Despite this, international institutions like the United Nations (UN) have established human rights responsibilities which are independent of the government's ability or willingness to protect human rights both nationally and internationally (United Nations, 2011; Amnesty International, 2016). These are outlined in the UN Guiding Principles on Business and Human Rights (UNGPs), which defines normative stand-points for all companies regarding behaviour and human rights across their supply chains (Amnesty International, 2016; Barreto *et al.*, 2018b). This derives from the principle that companies have a responsibility to '*do no harm*', primarily by taking steps to ensure they are not profiting from, or contributing to, human rights abuses as a result of their activities or business relationships (United Nations, 2012). To demonstrate this responsible conduct to the UN and the public, companies must conduct supply chain due diligence. This is an investigative approach used by companies for gathering supply chain information both internally (i.e. supply chain management processes) and externally (i.e. suppliers' management processes) as a means "to identify, prevent, mitigate and account for how they [companies] address their impacts on human rights"(United Nations, 2011, p. 16).

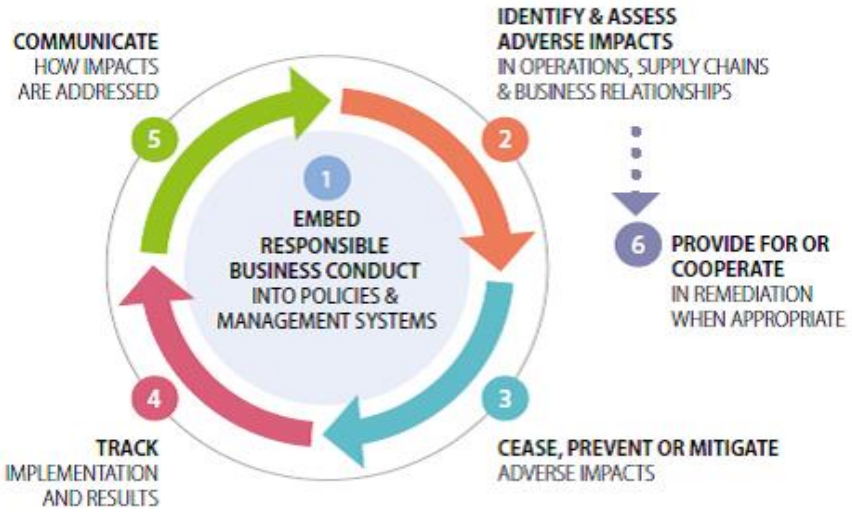


Figure 8: Five-step framework for corporate due diligence in the Due Diligence Guidance (Source: OECD 2013)

The responsibilities outlined in the UNGPs extends to companies in the mineral value chain. This is particularly true for downstream electronics MNCs, whose access to consumer markets drives demand and value-creation in the mineral market which, ultimately, has the largest influence on the mineral value chain (Young *et al.*, 2010; Prenkert, 2014; Callaway, 2018) Furthermore, in recognition of the corporate role in addressing mining-related sustainability risks, the OECD developed a risk-based mineral due diligence framework (Due Diligence Guidance). Providing a benchmark for companies involved in the sourcing of minerals or metals from high-risk and conflict-affected areas[8] (steps are shown in *Figure 8*). The OECD is an established and influential leader in setting corporate standards, defining internationally recognised frameworks on corporate responsibility (i.e. Guidelines for Multinational Enterprises [MNEs]) and effective governance (i.e. Principles of Corporate Governance). Like these frameworks, the Due Diligence Guidance is not legally binding. However, it applies normative corporate

[8] Annex II of the Due Diligence Guidance defines 'conflict-affected and high-risk areas' as areas of political instability or repression, institutional weakness, insecurity, collapse of civil infrastructure and widespread violence. Such areas are often characterised by widespread human rights abuses and violations of national or international law (OECD, 2013, p.13). A representative list of risks defined by Annex II is shown in Annex 1 of this report.

responsibility principles to the mineral supply chain reflecting those outlined in the UNGPs (Steinweg and Kate, 2013; Prenkert, 2014). This is broadly applicable to all minerals and companies within these supply chains, even corporations far removed from upstream risks (Deberdt and Jurewicz, 2018). Although, the OECD recognises varying responsibilities for certain minerals (i.e. 3TG) and companies of differing size, sectors and location in the supply chain (Global Witness, 2017). The aim of this is to provide a 'proactive and reactive' process for all mineral sourcing companies so they can establish effective policies and management systems for responsible mineral sourcing (Global Witness, 2017). According to the OECD, this should be used to identify and assess risks in the GVC, enabling informed risk mitigation, prevention and remediation strategies (Hofmann *et al.*, 2015). Due diligence is also an ongoing process and systems should be established with suppliers to monitor and track performance, with evidence of this made publicly available via annual reporting to indicate that company is implementing its responsible sourcing policies[9, 10] (OECD, 2013b; Global Witness, 2017). While this may not always guarantee a company's supply chain is free of risk, given that the mineral value chain is dynamic and complex, downstream companies are expected to work with suppliers to continually scrutinise and evaluate mineral sources using the Due Diligence Guidance (Callaway, 2017)

The corporate responsibilities outlined in the Due Diligence Guidance can be outlined as such; downstream companies should develop internal systems for tracing products to midstream SORs[11] (OECD, 2013b). This is a critical point in the mineral value chain where relatively few actors link minerals from various sites to buyers in the global metal market, for example only about 200-300 smelters produce all 3TG metals. Moreover, the origins of mineral ore cannot be determined once smelted, due to the mixing of ore from various sources (OECD, 2013b). Thus, by strategically identifying links to SORs, downstream companies can effectively identify potential red flags for sustainability risks and then manage relationships with relevant suppliers address risks accordingly (OECD, 2013b; Hofmann *et al.*, 2015). The aim is to foster a supply chain-wide approach to due diligence, whereby companies at various downstream tiers collaborate with direct suppliers to monitor and manage relationships with SORs (Amnesty International, 2016). To encourage this, larger downstream MNCs can build control over suppliers by utilising their purchasing power, which can be used as leverage to incorporate OECD mineral sourcing standards and Due Diligence Guidance into supplier relationships (Distelhorst *et al.*, 2015; Jameson *et al.*, 2016; Young, 2018).

Meanwhile, upstream companies in close proximity to upstream risks (relatively) are most able to, and directly, gather information in high-risk areas and mitigate mineral sustainability risks. As such they should establish assessment teams to establish "verifiable, reliable and up-to-date information on the qualitative circumstances of mineral extraction, trade, handling and export" (OECD, 2013b, p. 13). This should be used by upstream companies to identify, assess and address relevant risks by working with stakeholders, while also shared with downstream companies to inform their risk management (Global Witness, 2017). Moreover, rather than simply discontinuing a trading relationship with a non-compliant supplier, which can exacerbate existing risks, all companies have a responsibility to remedy negative upstream impacts (OECD, 2013b; Hofmann *et al.*, 2015; Amnesty International, 2017). As part of this, engaging with a range of local, national and international stakeholders (i.e. local/national governments, CSOs, affected third parties) can facilitate more effective verification of risks but also improve the remediation of adverse impacts on-the-ground[12] (Jameson *et al.*, 2016; OECD, 2016). Although companies retain individual responsibility for conducting due diligence (Global Witness, 2017).

[9] Annex III of Due Diligence Guidance outlines suggested measures and indicators to design conflict and high-risk sensitive strategies for mitigation in the risk management plan and measure progressive improvement (OECD, 2013b, p.18).

[10] The OECD, ILO and Global Reporting Initiative, among others, offer frameworks to aid corporate reporting.

[11] Smelters and refineries are metallurgical facilities that produce crude and refined metal products, respectively. For simplicity the term 'smelter' will be used to describe both smelting and refining steps due to their similarity, although these are differing processes and minerals do not all follow the same refining or smelting processes.

[12] The OECD define specific guidance to support stakeholder engagement, particularly among upstream companies in the extractive sector (i.e. *OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractives Sector*).

2.2.3 Public Governance: in 'home states'

The Due Diligence Guidance is now recognised by the 34 OECD member-states, as well as by some 75 affiliated countries and the 11 countries signed to the International Conference on the Great Lakes Regions[13] (ICGLR). Due to the collective influence and market power of these countries, the Due Diligence Guidance has gained considerable traction as an international corporate standard for responsible mineral sourcing (Prenkert, 2014; Deberdt and Jurewicz, 2018). Various statutory legal frameworks also incorporate the Due Diligence Guidance, aimed at preventing third parties (i.e. companies) from violating human rights abroad (Amnesty International, 2016). To this effect, in 2010 the US Senate passed the *Dodd-Frank Wall Street Reform and Consumer Protection Act*[14], containing a statutory provision on conflict minerals in Section 1502 (Jameson *et al.*, 2016). This requires publicly traded companies domiciled or headquartered in the US (known as a '*home state*' country) to investigate the "source and chain of custody of its conflict minerals" (Jameson *et al.*, 2016, p. 1380). As part of this, companies must report annually to the US Securities and Exchange Commission (SEC) on products which contain conflict minerals, as well as the due diligence measures taken to ensure they do not contribute to conflict (The Enough Project, 2010; Seay, 2012; Jameson *et al.*, 2016; Young, 2018). The Due Diligence Guidance is among a range of recognised frameworks by which mineral due diligence must be conducted, though it is the most widely used (Prenkert, 2014; Jameson *et al.*, 2016).

Based on frameworks such as the Due Diligence Guidance, companies adhering to the Dodd-Frank Act must audit their supply chains and ensure that minerals are not mined by or traded via armed groups in the DRC (Prenkert, 2014). Annual conflict mineral reports should contain information regarding a company's use of conflict minerals and be submitted to the SEC for public dissemination. Thus, allowing the corporate activities to be globally and transparently monitored by other companies, regulators and the public, who can hold poorly performing companies to account (i.e. via purchasing choices) (Prenkert, 2014; Global Witness, 2017; Young, 2018). The Dodd-Frank Act is a vanguard in mandating responsible mineral sourcing measures among MNCs, paving the way for a range of extraterritorial regulatory efforts within other home states (Jameson *et al.*, 2016; Deberdt and Jurewicz, 2018; Sydow and Reichwein, 2018; Young, 2018). This includes various policies in effect or under consideration, for example in the EU (*Regulation 2017/821*), US (*California Transparency in Supply Chains Act*), Canada (*Bill C-486*), UK (*Modern Slavery* and *Bribery Acts*), France (*Duty of Vigilance Law 2017-*399), and China (*Chinese Due Diligence Guidelines*). The ICGLR has also established regional legal frameworks for conflict minerals incorporating the Due Diligence Guidance, aiming to increase collaboration among member states (most of which are mineral source countries) in addressing the exploitation and trade of conflict minerals from the region (ICGLR, no date).

Despite these achievements, only a few governments have introduced regulatory requirements addressing the unique challenges related to mineral supply chains. Those that exist tend to focus on the reporting of specific risks and/or minerals in specific locations (i.e. conflict-related 3TG in the DRC). As such, current regulation has been criticised for failing to directly sanction companies using or importing conflict minerals, while also not addressing a broader range of sustainability risks associated with other high-risk minerals (i.e. cobalt) and high-risk source countries (i.e. Colombia and Myanmar) (Resolve, 2010; Amnesty International, 2016; Jamasine, 2017; Sydow and Reichwein, 2018). Critics also express concern that current regulation creates a *de facto* ban on minerals from certain regions (i.e. Great Lakes region of Africa), which are automatically labelled as conflict minerals as an unintended side-effect (Seay, 2012; Jameson *et al.*, 2016; Rustad *et al.*, 2016; Young, 2018; Matthysen *et al.*, 2019). Stigmatising minerals from certain regions in this way creates uncertainty for buyers who may source from lower risk areas to avoid potential consumer backlash and costs of due diligence. Yet, discouraging business with legitimate mining operations, which supports millions of people across the Great Lakes region of Africa, can undermine social and economic development with the potential to exacerbate existing

[13] The Due Diligence Guidance was developed through a multi-stakeholder process with the ICGLR; a supranational organisation which incorporates Angola, Burundi, Central African Republic, Republic of Congo, Democratic Republic of Congo, Kenya, Rwanda, Sudan, Tanzania, Uganda and Zambia (OECD, 2013b).

[14] Henceforth abbreviated to as the '*Dodd-Frank Act'.*

sustainability risks (Seay, 2012; Deberdt and Jurewicz, 2018). Moreover, various academics argue that the dominant western narrative of conflict minerals simplifies the connection between minerals and conflict, following a neo-colonial rational which impedes more creative and inclusive solutions to sustainability risks in conflict areas (Seay, 2012; Hofmann *et al.*, 2015; Jameson *et al.*, 2016). This includes more effective interpretations and applications of the Due Diligence Guidance (or alternative schemes) at local, regional, national or international scales which improve livelihoods on-the-ground and address the deeper causes of conflict, rather than focusing on the elimination of conflict minerals (Prenkert, 2014; Jameson *et al.*, 2016).

2.2.4 Private Governance: corporate sustainability

National governments in source countries and home states have a key role in addressing gaps in the governance of conflict minerals. Although, governments cannot singlehandedly address the complex governance gaps which occur on multiple scales in the mineral value chain, indeed, weak public governance and a lack of state regulatory capacity often contribute to mineral sustainability risks (Prenkert, 2014; Hofmann *et al.*, 2015; Sydow and Reichwein, 2018). Yet, statutory and non-statutory policy frameworks have defined mineral sustainability standards against which companies can be held accountable, while also increasing industry and public awareness of adverse upstream impacts in the mineral value chain (Deberdt and Jurewicz, 2018). Furthermore, due to their role as mineral end-users, electronic brands are under significant moral pressure from the public and corporate stakeholders (i.e. media, consumers, CSOs, shareholders) to implement internationally agreed-upon sustainability standards (The Enough Project, 2010; Hofmann *et al.*, 2015; KnowTheChain, 2018; Sydow and Reichwein, 2018). Downstream electronics MNCs are particularly exposed to public scrutiny and vulnerable to negative publicity (Raj-Reichert, 2011; Seay, 2012; Hofmann *et al.*, 2015). Therefore, many have developed voluntary programs to manage environmental, labour, health and safety, and ethical risks in their supply chains. These measures reflect quality assurance, CSR and supply chain management processes which are well-established mechanisms for managing suppliers and meeting certain industrial standards (Young *et al.*, 2010; Raj-Reichert, 2011; Matthysen *et al.*, 2019). Sustainability management can work in parallel with these measures, delivering various benefits which can improve competitive advantage. For example, improving stakeholder relationships, enhancing company/brand image, supporting market-share growth, and/or providing efficiency savings (Hofmann *et al.*, 2015).

Whether due to regulative, public or competitive pressures, sustainable mineral initiatives are now at the centre of corporate responsible practices for electronics companies (Hofmann *et al.*, 2015; Deberdt and Jurewicz, 2018). These initiatives differ in scope and purpose depending on the size and supply chain position of the company, consequently, a diverse range of initiatives have emerged covering various combinations of minerals (e.g. 3TG, cobalt, platinum) and sustainability risks (e.g. child labour, conflict, human rights). The Due Diligence Guidance forms the backbone of the majority of these, following its practical steps for responsible mineral sourcing, transparency and reporting (Young *et al.*, 2010; Distelhorst *et al.*, 2015; Hofmann *et al.*, 2015; Deberdt and Jurewicz, 2018). According to Hofmann *et al.* (2015), electronics companies have adopted a range of *compliance*, *commitment* and *analytically* oriented measures for the implementation of supply chain due diligence. These may not be mutually exclusive, for example, pro-active due diligence programs should seek to *analyse* mineral sourcing practices among suppliers; enforce *compliance* among suppliers in violation of standards; as well as collaborate with other companies to support due diligence practice and ongoing *commitment* (Hofmann *et al.*, 2015). This reflects responsible sourcing initiatives developed by large brand companies such as Apple, Microsoft and Intel, which seek to 'deepen and broaden' due diligence practices as a way of simultaneously building power (i.e. leverage) and trust among suppliers (Hofmann *et al.*, 2015; Deberdt and Jurewicz, 2018). Following the understanding (in GVC literature) that "power and governance operate through administrative controls and flows of information between lead firms [brands] to suppliers" (Raj-Reichert, 2011, p. 225).

Despite the growth in private forms of governing mineral sustainability, research by academics and advocacy groups highlights a disparity between companies regarding their due diligence performance (The Enough Project, 2010; Deberdt and Jurewicz, 2018; KnowTheChain, 2018). Laggard companies tend to cite financial and administrative costs for this gap, as well as the overwhelming complexity of the mineral value chain (The Enough Project, 2010; Hofmann *et al.*, 2015; Jamasine, 2017). As discussed, brand companies rarely have direct

relationships with mineral and metal suppliers, who instead rely on information passed through various tiers of globally dispersed suppliers to understand how/where minerals are sourced (Amnesty International, 2017). This results in various challenges when tracing minerals to their source: 1) supply chains are not transparent to this level; 2) due diligence mechanisms lack capacity or expertise to trace to this level; 3) the ability to differentiate mineral sources on-the-ground (particularly in conflict areas) is lacking (Resolve, 2010). These are exacerbated when working with a large number of suppliers, particularly smaller upstream companies who are less exposed to public pressure and not directly influenced by the buying-power of brands while also having limited resources to perform analysis on multiple actors (Resolve, 2010; Young *et al.*, 2010; Hofmann *et al.*, 2015). Thus, challenging the notion that governance and power are always directed by brand companies over suppliers, instead, power relations across the GVC are "multiple, nuanced and dynamic" (Raj-Reichert, 2011, p. 225). In fact, by introducing criteria for mineral sourcing, companies alter the structure and dynamics of supply chain relationships with potential resistance from suppliers due to the loss of business, increased costs and requirements to share sensitive business/supply chain information (Resolve, 2010; Hofmann *et al.*, 2015).

The implementation of private forms of mineral governance is not only affected by relations between actors in the GVC but also by the societal (cultural, economic and political institutions) and territorial (local, national, global scales) context in which companies operate (Raj-Reichert, 2011). For example, regulations like the Dodd-Frank Act only focus on SEC-filing companies, meaning smaller companies and those absent from the US market are not obligated to conduct or engage in mineral due diligence (Hofmann *et al.*, 2015). Moreover, efforts by the current US administration to dilute corporate regulations (including the Dood-Frank Act) have also been blamed for a recent decline in due diligence efforts (Resolution Possible, no date a; Deberdt and Jurewicz, 2018). Research by Global Witness (2017) and KnowTheChain (2018) suggests that this has resulted in a disconnect between corporate responsible sourcing policies, their implementation, and the public reporting; a relationship compounded by the interpretive and often voluntary nature of standards like the Due Diligence Guidance. For example, in 2018 only 45% of 3TG exporting companies in the DRC published due diligence reports, despite it being a legal requirement in the DRC (Global Witness, 2017). This may be substantially less in countries where sustainability risks linked to mining are less potent, or public awareness of the risks is lower. Highlighting that while proactive companies aim to comply to or even go-beyond responsible mineral sourcing standards, a lack of corporate leadership and motivation means many companies fail to operationalise frameworks like the Due Diligence Guidance effectively (The Enough Project, 2010; Hofmann *et al.*, 2015; Amnesty International, 2016; Deberdt and Jurewicz, 2018). Resulting in efforts by companies to avoid the use of conflict minerals based on vague assurances or by sourcing from non-conflict areas altogether, rather than perusing credible investigation or remediation of negative impacts in high-risk and conflict areas (The Enough Project, 2010; Hofmann *et al.*, 2015).

2.2.5 Private Governance: industry organisations

However, since the early 2000's proactive electronics companies have developed industry associations for collective and more efficient sustainability practices, establishing centralised policy-making bodies like the Green Electronics Council (GEC), Global e-Sustainability Initiative (GeSI), and RBA (Prenkert, 2014; Jameson *et al.*, 2016; Deberdt and Jurewicz, 2018). As part of these industry-wide bodies, members must adhere to a standardised sustainability code-of-conduct which incorporates various international requirements for sustainability among individual companies, like those derived from the UNGPs, ILO, OECD and government legislation (The Enough Project, 2010; Raj-Reichert, 2011). In return for membership fees, members benefit from a range of legitimate risk assessment tools, procedures and training to support company-specific sustainability management programs (Resolve, 2010; Prenkert, 2014). In addition, industry bodies aim to facilitate cross-industry collaboration between competitive firms by offering platforms for sharing supply chain information, research and best practices, which aggregates industry leverage while also reducing the potential for overlapping efforts and inefficiencies between companies (Resolve, 2010; The Enough Project, 2010; Raj-Reichert, 2011; Jameson *et al.*, 2016; Young, 2018).

Industry bodies have also been established specifically to develop responsible mineral sourcing standards and management initiatives, adopting a range of different institutional features and agendas within this (as shown in *Table 1*). This includes the London Bullion Market Association (LBMA), Responsible Jewellery Association (RJC),

International Tin Research Initiative (ITRI), although the largest is the RMI (formerly the Conflict-Free Sourcing Initiative) with over 360 members across the electronic, automotive, aerospace, extractive, and telecommunication industries, including some of the world's largest mineral end-users like Apple, Microsoft, HP, Intel, Samsung and Toshiba (The Enough Project, 2010; Jameson *et al.*, 2016; Young, 2018). The RMI engage with and audit SORs as part of its 'Responsible Minerals Assurance Process' (RMAP), focusing on the certification of SORs which meet its RMAP standard[15]. This provides a credible assessment of responsible sourcing practices and regulatory compliance among midstream companies (as shown in *Figure 9*), a strategic chokepoint in the mineral value chain due to the relatively low numbers of SORs responsible for processing large volumes of minerals (Prenkert, 2014; Young, 2018).

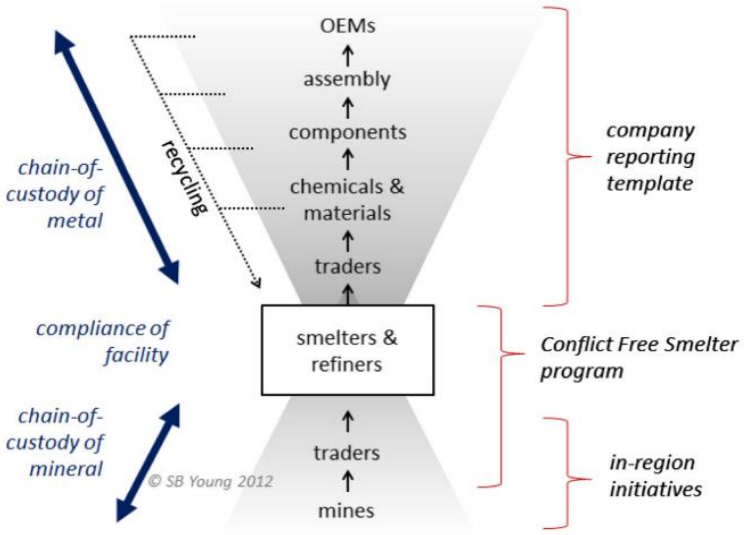


Figure 9: The mineral value chain is depicted showing the metal (downstream) and mineral (upstream) chains of custody, as well as initiatives for mineral transparency. Within this, SORs (midstream) are a key choke point in the GVC for responsible mineral sourcing initiatives (Source: Young, 2018).

Members of the RMI are also obliged to conduct due diligence in accordance with the Due Diligence Guidance, whether in the upstream or downstream (depending on their location in the GVC). The RMI provides certification tools and capacity building (e.g. standardised reporting templates) to assist due diligence and support informed risk management decisions among downstream companies (Resolve, 2010; Prenkert, 2014; Hofmann *et al.*, 2015; Deberdt and Jurewicz, 2018). These external tools and certification processes can reduce the costs and complexity involved, while also building trust among all actors regarding the exchange of confidential/sensitive information and changing business relationships (Resolve, 2010; Prenkert, 2014; Hofmann *et al.*, 2015; Young, 2018). Similarly, initiatives are also in place to support upstream companies. These provide funding and training to support the adoption of systems for tracing minerals to source sites, addressing potential risks and verifying sustainable mineral sources (Deberdt and Jurewicz, 2018; Young, 2018). While this seeks to prevent and remedy sustainability risks in high-risk areas, it also aims to create a market for legitimate minerals and keep unsustainable minerals out of the supply chain. Projects include the ITRI's Tin Supply Chain Initiative (iTSCi) or the ICGLR's Regional Certification Initiative work with the RMI to audit upstream companies, using 'bag and tag' or 'closed-

[15] RMAP audit standard includes the Due Diligence Guidance and Dodd-Frank Act requirements. As such, applicable SORs must not only comply to the conflict-mineral requirements of the Dodd-Frank Act but also the broader range of sustainability risks identified in Annex II of the Due Diligence Guidance.

pipeline' systems to track and manage minerals from certified mines to the smelter (Resolve, 2010; The Enough Project, 2010; Jameson *et al.*, 2016).

This multi-level approach focusing on in-region initiatives and SOR-based certifications aims to track minerals using credible mechanisms throughout their lifecycle to ensure the transparency and integrity of certified mineral flows across the GVC. In doing so, ensuring compliance across the electronics industry to rigorous responsibility standards (e.g. the Due Diligence Guidance), focusing on risk-assessments of high-risk SORs and minerals within these supply chains (Resolve, 2010). Yet, governance mechanisms for linking downstream actors to the upstream production of minerals largely focus on conflict-related risks and remain relatively new in the electronics industry, especially compared to initiatives like 'Fair Trade' certification in forestry and food industries or the garment sector's 'Clean Clothes Campaign' and 'Fair Wear Foundation' (Fransen and Conzelmann, 2015; Young, 2018). Furthermore, industry-wide efforts to govern the mineral value chain in the electronics sector have been criticised for leading "to a lowest common denominator response [among electronics companies]" (The Enough Project, 2010, p. 2). Thus, lacking overall impact in terms of socio-economic development on-the-ground in high-risk mining areas like the DRC, where conflict and poverty persist (Seay, 2012; Prenkert, 2014; Jameson *et al.*, 2016; Matthysen *et al.*, 2019). Partly, this stems from the difficulty in operating initiatives in unstable regions like the DRC (Prenkert, 2014). Yet, Jameson *et al.* (2016) argue that even reducing violence in areas like the DRC does not (in itself) provide opportunities reduce poverty levels, which requires political and mining sector reform in these countries (particularly ASM). Therefore, to increase the credibility and sustainability of responsible sourcing initiatives globally there is need to address the deep-rooted problems in the mining sector, in which informality, corruption, lack of worker representation and weak public institutions fuel the pervasive sustainability risks caused by ASM and LSM alike (Jameson *et al.*, 2016; Matthysen *et al.*, 2019). As part of this, traceability initiatives could be used to incorporate the local population into mining reforms, directing investment into responsible mining practices and wider development initiatives (Seay, 2012; Jameson *et al.*, 2016; Matthysen *et al.*, 2019). To increase the efficacy of this, responsible sourcing initiatives should also engage government and civil society representatives in source countries as part of shared responsibility for mining and mineral governance in high-risk areas (Matthysen *et al.*, 2019).

2.2.6 Multi-stakeholder Governance

The governance of mineral sustainability is ultimately the responsibility for public and private actors, however, civil society has a growing influence on the development of public legislation and private codes of conduct (Prenkert, 2014). For example, CSOs have been instrumental in identifying and mitigating upstream risks in the mineral value chain, while also mobilizing 'bottom-up' support for sustainability standards via consumer campaigns (Prenkert, 2014). Raising the profile of international sustainability standards brings increased moral, public and political leverage for holding MNCs and the government to account regarding mineral sustainability risks. By doing this, NGOs such as Amnesty International, Global Witness, and The Enough Project have been able to provide expert recommendations to address sustainability problems based on anecdotal evidence, as well as put pressure on public and private actors for regime change (Raj-Reichert, 2011; Jameson *et al.*, 2016). Yet, increasingly NGOs have collaborated with companies to support or add credibility to supply chain due diligence, for example by overseeing the operation of grievance mechanisms or third-party audits (Resolve, 2010; Raj-Reichert, 2011; Distelhorst *et al.*, 2015). Additionally, by working with local civil society, community or miners'

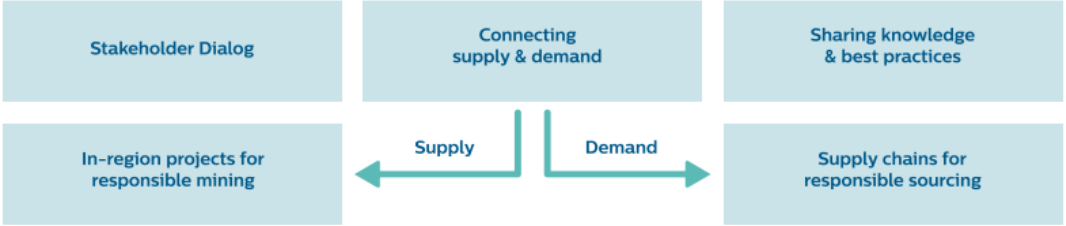


Figure 10: EPRM approach for developing mineral responsibility across the supply chain (Source: Koninklijke Philips N.V. 2019)

organisations on-the-ground (e.g. AFREWATCH) NGOs have sought to aid remediation initiatives, providing more direct and legitimate means of improving socio-economic conditions in high-risk areas.

In recognition of this, multi-stakeholder organisations incorporating NGOs alongside industry and government representatives have emerged in recent years, occupying a space between top-down and bottom-up governance (Distelhorst *et al.*, 2015). For example, multi-stakeholder initiatives like the European Partnership for Responsible Minerals (EPRM) provide a platform to increase collaboration between stakeholders, connecting initiatives focused on developing demand for responsibly-sourced minerals and in-region initiatives focused on establishing the supply of verified sustainable minerals (as shown in *Figure 10*). In doing so, the EPRM encourages "cross-sector learning and support for the implementation of due diligence mechanisms along the entire chain" (Koninklijke Philips N.V., 2019, p. 1). Despite this progress, limited requirements or willingness among electronics MNCs to increase supply chain transparency undermines multi-stakeholder interaction (Overeem, 2009; Evermann, 2014; Cook and Jardim, 2017). Industry initiatives like the RBA also fail to engage with CSOs on an equal and long-term basis, in large part due to ideological differences on issues like freedom of association and worker empowerment (Raj-Reichert, 2011; Fransen and Conzelmann, 2015). As a result of these entrenched relationships within electronics governance, corporate sustainability measures lack verification by independent stakeholders, leading to mistrust of industry-led initiatives among many CSOs (Overeem, 2009). Yet, many authors argue that effective governance of sustainability across the mineral value chain requires interactive approaches involving multiple stakeholders (i.e. Resolve, 2010; Prenkert, 2014; Jameson *et al.*, 2016; Deberdt and Jurewicz, 2018). This provides a way for stakeholders operating on local, national and international scales to share expertise, best practices and governance roles. Thus, increasing the capacity and impact of supply chain responsibility initiatives, while also extending them beyond minimum standards or obligations (Evans and Vermeulen, 2020). Transitions towards more participatory governance have already been established within wider environmental governance, as recognised by Driessen *et al.*, (2012). As such, the electronics sector should take lessons from other industries, like the garment sector, where established multi-stakeholder initiatives are being used to address the negative sustainability impacts in global supply chains.

2.2.7 Summary of Literature

SECTOR	***Policy instruments*** *(associated actors/examples)*
MARKET	**Corporate-level:** *Corporate supply chain and sustainability standards (i.e. HP, Apple, Intel)* **Industry-level:** *Industry standards and codes of conduct (e.g. RBA/RMI; ITRI; Better Sourcing Program; KEMET Partnership; Tungsten Industry Conflict Minerals Council; London Bullion Market Association; Responsible Jewellery Council: World Gold Council; Alliance for Responsible Mining; Responsible Cobalt Initiative)*
CIVIL SOCIETY	**National and International -level:** *Supply chain sustainability campaigns (e.g. Amnesty International; Fair Labour Organisation; Greenpeace; Human Rights Watch, The Enough Project; RESOLVE; Responsible Sourcing Network)* *Electronics sustainability campaigns (e.g. Closing the Loop; coolproducts; GoodElectronics Network; Electronics Watch; Global Witness; makeITfair)*.
STATE	**National-level:** *State policies (e.g. labour and environmental regulation in source countries); extraterritorial regulation in home states (i.e. US Dodd-Frank Act, UK Modern Slavery Act, California Transparency in Supply Chains Act).* **Supranational-level:** ***EU directives*** *(e.g. Conflict Minerals Regulation);* ***UN frameworks*** *(e.g. Universal Declaration of Human Rights, United National Guiding Principles for Business and Human Rights, Security Council resolutions on DRC);* ***ILO standards*** *(e.g. Rights of People at Work);* ***OECD guidelines*** *(e.g. Guidelines for Multinational Enterprises, Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas);* ***ICGLR*** *(i.e. Regional Certification Initiative)*
MULTI-STAKEHOLDER	**International-level:** Multi-stakeholder initiatives *(e.g. European Partnership for Responsible Minerals; Public-Private Alliance for Responsible Minerals Trade; RAGS; Dutch Gold Sector IRBC Agreement).* **Local-level:** In-region Initiatives *(Resolve/Solutions for Hope; Pact; IMPACT; Congo Power Project)*

Table 1: Summary of mineral sustainability governance standards and legal frameworks, as well as main governing actors and their related sector.

All too often in areas with absent, weak or poorly enforced mining regulations minerals remain linked to a range of human, labour and environmental rights abuses, particularly when the extraction and trading of minerals are organized informally or illegally. Conflict attached to this illegal trade also remains a primary area of concern, despite the emergence of legislation and initiatives which focus on tackling conflict minerals on various scales (see Table 1). However, international corporate responsibility standards established by organisations like the UN and OECD have defined normative standpoints regarding responsible mineral sourcing, motivating policy-development across government, industry and civil society sectors (Martin-Ortega, 2018). In this context, supply chain due diligence has emerged as a key mechanism for building more secure, transparent and verifiable supply chains for legitimate minerals, paving the way for the formalisation and legalisation of mineral extraction/trading (OECD, 2013b). This is part of a governance environment where companies across the value chain are responsible for investigating, managing and remedying adverse upstream impacts, no matter the legal context in which business operations take place. This market-based approach has also led to a range of innovative and cost-effective measures for implementing responsible mineral sourcing and establishing a demand for sustainable minerals, often acting in a complementary manner with governments, international organisations, industry bodies and CSOs (OECD, 2013b; Distelhorst *et al.*, 2015).

Yet, responsible mineral sourcing involves coordinating with multiple supply chain actors within a complex and dynamic setting, resulting in a range of internal and external barriers to success at the corporate-level. Meaning that in practice due diligence standards and regulations are interpreted and implemented in a broad spectrum of ways by different companies, with much work for companies still to do regarding the implementation of mineral due diligence into business management (Hiller and Hiller, 2014). Despite this, some companies have adopted innovative and proactive due diligence programs. For example, participating in two-way multi-stakeholder programs like the RMI or Public-Private Alliance for Responsible Minerals Trade (PPA). These organisations allow CSOs to participate in mineral governance and support corporate due diligence efforts in a variety of ways, e.g. via research, advocacy or active collaboration (Hofmann *et al.*, 2015; Deberdt and Jurewicz, 2018).

Overall, it is clear that sustainability governance in the electronics sector is characterised by a diverse *milieu* of evolving relationships of power and dependency between public, private and civil society actors (Abbott and Snidal, 2009; Shift and IHRB, 2011). This has resulted in a multi-faceted regulatory landscape containing various co-existing standards and legal frameworks for mineral sustainability, governed by a range of public and private actors (see *Table 1* for a summary). As a result, it is difficult to determine the overall cohesiveness and effectiveness of current mineral governance mechanisms (Fransen and Conzelmann, 2015; Sydow and Reichwein, 2018). In this setting Driessen *et al*. (2012) outline that analysing the structure (i.e. actors) and composition (i.e. policy outputs) within governance is vital to understand successful outcomes. Therefore, this article, by conducting a broad overview of mineral governance in the literature, pieces together the multi-faceted landscape of governance. In doing so, using the literature to critically analyse the structure and composition of governing sustainability across the mineral value chain, with an eye to identifying factors which influence the overall level of governance effectiveness in terms of sustainability outcomes.

3. Conceptual Framework: due diligence and stakeholder engagement

As briefly explained in Section 2.2, the responsibility falls on downstream companies (especially large brands and MNCs) to establish management systems for responsible mineral sourcing internally and among suppliers. Yet, mineral due diligence is an iterative process which seeks to identify and manage upstream sustainability risks in complex and dynamic supply chains which are affected by policy-actors at local, national and international scales. Therefore, engaging with various stakeholders is an important prerequisite for overcoming this complexity as part of effective risk identification and management (Shift, 2013; OECD, 2016). All companies have stakeholders, a term used to define individuals or groups who may affect or be affected by a business' activities (see *Figure 11* for a model of corporate stakeholders) (Donaldson and Preston, 1995; Shift, 2013). In fact, engaging with stakeholders is an essential part of many routine business activities like managing workplace risks, product quality, supplier relationships or meeting consumer and shareholder expectations (Krick *et al.*, 2005). Broadly, stakeholder engagement can be understood as a:

> *"process of interaction and dialogue between a company and its potentially affected stakeholders [internal and external] that enables the company to hear, understand and respond to their interests and concerns, including through collaborative approaches."* (United Nations, 2012, p. 8)

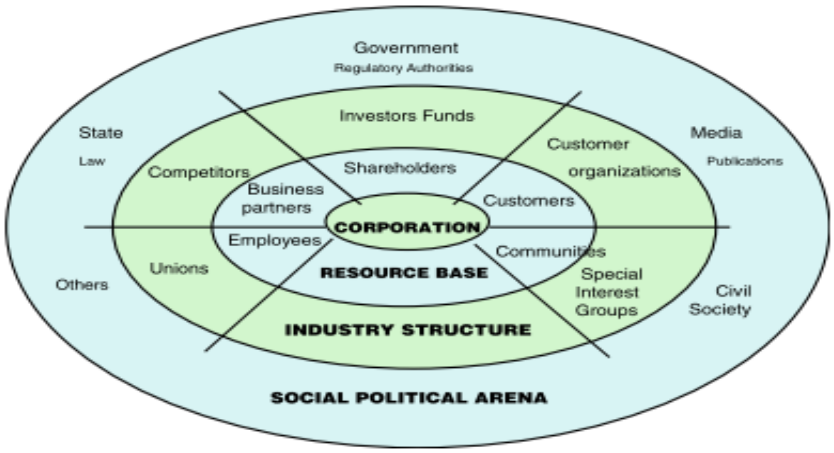


Figure 11: Example of the stakeholder model (Source: Fassin, 2009)

Mineral due diligence itself may involve engaging with any number of stakeholders, although certain critical stakeholders should be prioritised. For example, engaging with employees and executives is vital for ensuring that the correct experience, skills and culture are in place to promote effective due diligence policies and their implementation (Shift and IHRB, 2011). Developing systems to effectively engage and coordinate with suppliers is also important, enabling the sharing information, capacity and strategies regarding the management of sustainability risks (Hofmann *et al.*, 2015). It is worth noting that these risks have adverse upstream impacts, impacting various upstream stakeholders (often referred to as 'rights-holders'[16]) including mineworkers, national/regional government and local communities. Who, if incorporated into due diligence, can contribute important knowledge of these adverse impacts to inform corporate policies and risk management strategies (Shift, 2013; OECD, 2016). A broader group of government, industry and civil society stakeholders, operating at international, national and local scales can also be engaged to provide external expertise, problem-solving capacity and resources to facilitate positive socio-economic development in adversely affected areas (Resolve, 2010; Shift and IHRB, 2011).

[16] From a human rights perspective, rights-holders are individuals or social groups with legitimate claims or entitlements in relation to specific duty-bearers (e.g. UDHR)

As a result, it is widely acknowledged that stakeholder engagement is an important tool for downstream companies in understanding upstream sustainability risks, as well as transferring this into sustainability management practice and strategy (Krick *et al.*, 2005; Fassin, 2009; Taylor and Bancilhon, 2019). Furthermore, effective engagement can improve brand reputation among external groups, while also increasing learning and innovation in terms of internal processes. Thus, enabling companies that work with stakeholders to "gain insights, solve problems, and reach [sustainability] goals that none of them [stakeholders] could reach alone" (Krick *et al.*, 2005). Overall, contributing to better understanding and implementation of corporate sustainability objectives, while also adding value and credibility to business operations among stakeholders with potential win-win benefits (Krick *et al.*, 2005). Yet, engaging with stakeholders represents a challenge for companies and implementation remains limited, largely this is because some companies lack internal interest or the expertise to build relationships with some stakeholders (Taylor and Bancilhon, 2019). Likewise, if stakeholder concerns are not taken seriously, trust between stakeholders can be eroded with negative consequences for due diligence and rights-holders (Boadi *et al.*, 2019).

In light of these challenges, various national and international bodies have issued regulations and standards for stakeholder engagement within CSR. This includes government policy like the UK's Corporate Governance Code, as well as the GRI (Sustainability Reporting Guidelines), AccountAbility (AA1000 Series), OECD (Guidelines for MNEs) and United Nations (UNGPs) (Krick *et al.*, 2005; Taylor and Bancilhon, 2019). To complement this, guidelines exist to direct engagement practices and improve sustainability performance among companies (e.g. Krick *et al.*, 2005; IFC, 2007; Shift and IHRB, 2011; Taylor and Bancilhon, 2019). In addition, specific engagement guidance has emerged to assist supply chain due diligence. For example, the '*Stakeholder Engagement in Human Rights Due Diligence'* guide published by the Global Compact Network Germany (GCNG), as well as the OECD's *'Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractives Sector'*[17].

3.1 Meaningful Stakeholder Engagement

In this context, the OECD state that as part of corporate due diligence, companies should execute stakeholder engagement activities in ways that are "meaningful and contribute to avoiding and addressing adverse impacts" (OECD, 2016, p. 15). This is echoed in the UNGPs, which stress that due diligence "should […] involve meaningful consultation with potentially affected groups and other relevant stakeholders" (United Nations, 2011, p. 19). Meaningful engagement is as therefore recognised a core concept in due diligence and can be loosely defined as "ongoing engagement with stakeholders that is two-way, conducted in good faith and responsive" (OECD 2016; p.10). This highlights how relationship building underpins positive and proactive stakeholder engagement and is fundamental to successful engagement and supply chain due diligence, leading to more effective governance of mineral sustainability risks (GCNG, 2014).

Yet, stakeholder engagement is a process involving a range of corporate decisions, policies and policy outputs (i.e. regulations, objectives, plans etc.) which determine how effective it is. As stated, various methodologies exist to guide corporations in initiating and sustaining constructive stakeholder relationships. Based on stakeholder engagement literature (i.e. Krick *et al.*, 2005; Taylor and Bancilhon, 2019) and principles outlined by the Stakeholder Engagement Guidance, the following steps outline a suitable framework for achieving meaningful engagement within mineral due diligence based on appropriate policy outputs (shown in *Figure 12*). The following steps section will further discuss this framework.

[17] Henceforth abbreviated to the '*Stakeholder Engagement Guidance'*

Figure 12: Framework for meaningful stakeholder engagement (Source: OECD, 2016)

Step 1: Engagement Strategy

Firstly, before conducting any form of engagement companies are expected to make a management commitment to meaningful stakeholder engagement, either by setting relevant policies or integrating this into existing codes-of-conduct (GCNG, 2014; OECD, 2016). The purpose of this is to set out the requirements, priorities and scope of the engagement, for example, this policy should meet international benchmarks for stakeholder engagement and commit to working with stakeholders to avoid adverse impacts (Krick *et al.*, 2005; OECD, 2016). Additionally, internal engagement with senior management, expert staff and employees can facilitate alignment of these policies to business strategy and operations, while also indicating the resources (i.e. knowledge, capacity, finances) available internally with which to conduct engagement (Krick *et al.*, 2005; Morris and Baddache, 2012). Establishing systems to incorporate stakeholder views into business decision making, relationships and management systems is also key (OECD, 2016). Not only does this ensure that engagement strategy is transparent and informed by stakeholder perspectives, but this can also ensure the ongoing and efficient monitoring and reporting of emerging risks (and rights-holders affected by this) (Krick *et al.*, 2005; Morris and Baddache, 2012; OECD, 2016).

Step 2: Identify and Analyse Stakeholders

An important initial part of designing and implementing stakeholder engagement activities requires mapping stakeholder groups. Within this, identifying stakeholders and analysing the characteristics of these individuals, groups or organisations is important for an understanding of the context in which engagement takes place (GCNG, 2014; AccountAbility, 2015; Taylor and Bancilhon, 2019). Criteria such as stakeholder *influence* (i.e. ability to influence a project or actor), *expertise* (i.e. assess to useful knowledge), *proximity* (to the company), *orientation* (i.e. willingness to engage), as well as the level of mutual *trust* (AccountAbility, 2015; Taylor and Bancilhon, 2019). Yet, to effectively map and profile stakeholders requires thorough knowledge of the local and operating environment (e.g. regulatory requirements, political environment and structure, historical events, socio-economic conditions, as well as cultural/ethnic/gender factors)[18] (OECD, 2016). A range of tools exists to facilitate this, including impact assessments, field research and secondary sources (OECD, 2016). Although due to the dynamic nature of local and operating contexts, mapping stakeholder should be iterative and continually informed by emerging information. Moreover, incorporating independent stakeholder groups like CSOs into this process can add credibility to the collection and/or evaluation of stakeholder data (OECD, 2016).

Having profiled stakeholders, it is also important to assess which are most important to engage concerning the purpose and scope of engagement (AccountAbility, 2015). Such analysis can be based on criteria like stakeholder influence, expertise, vulnerability, capacity and trust (Taylor and Bancilhon, 2019). This can be used to strategically prioritise certain stakeholders, an important consideration when engaging with rights-holders or vulnerable and under-represented groups (AccountAbility, 2015). For example, those who lack formal representation due to their characteristics (e.g. children, women, ASM workers, minority or indigenous groups) or circumstances (e.g. poverty, illiteracy, poor health or disability)[19] (Shift and IHRB, 2011; Taylor and Bancilhon, 2019). These vulnerable or marginalised groups generally experience adverse impacts more severely than others and may lack trust (of outsiders), awareness (of risks), as well as formal means of representation[20] (Shift, 2013; Matthysen *et al.*, 2019). Therefore, it is important to verify stakeholder representatives to ensure vulnerable groups are fairly(and equally) represented, while also ensuring that stakeholder needs are addressed regardless of their influence or ability to engage (Krick *et al.*, 2005; OECD, 2016; Taylor and Bancilhon, 2019).

Step 3: Plan Engagement

Stakeholder engagement which is not appropriately developed, conducted or incorporated into core business activities can also undermine stakeholder relationships (OECD, 2013b; Shift, 2013). For example, if companies do not allow stakeholders to participate fully in an open, equitable and fair manner, adverse impacts may not be identified or addressed. In fact, poor stakeholder engagement can give rise to adverse impacts in itself and undermine potential benefits to stakeholders (OECD, 2016). Therefore, it is important to appropriately plan engagement activities to establish the necessary support systems for meaningful engagement. This should start with setting out aims and objectives which reflect the corporate strategy and meaningful engagement, i.e. long-term relationship building (OECD, 2016). Making this clear to stakeholders before engagement, along with other relevant information (in an accessible format), also allows stakeholders to be informed and prepare for engagement appropriately (OECD, 2016; Taylor and Bancilhon, 2019). Furthermore, to build these relations of trust, "stakeholders must be treated with respect and treated like equals in the engagement process" (OECD, 2016, p. 38). This means listening and sharing information in a way that is accessible and culturally sensitive (Taylor and Bancilhon, 2019). Principles which should be reflected in the sufficient allocation of resources (human, logistical and financial) to support stakeholders and make engagement accessible, e.g. engagement context, location, format, and language.

[18] For a list of factors to incorporate into researching local context see Table II in OECD, 2016 (p.25).

[19] The Stakeholder Engagement Guidance includes specific guidelines on working with indigenous groups (Annex B), women (Annex C), workers (Annex D) and ASM miners (Annex E).

[20] Appendix 1 shows a list of stakeholders potentially affected (adversely) by mineral extraction.

Step 4: Implement Meaningful Engagement

Determining the level of engagement defines the nature of the relationship with the stakeholder(s) involved (AccountAbility, 2015; Taylor and Bancilhon, 2019). However, for engagement to be meaningful companies must select an appropriate 'mode' of engaging which meets the needs of stakeholders and corporate objectives (AccountAbility, 2015). These modes of engagement range from simple one-way communication, to more diverse and inclusive approaches (as shown in *Table 2*). It is the responsibility of companies to identify and strategically apply the appropriate mode of engagement over an appropriate timeline to allow for more meaningful engagement (GCNG, 2014; Taylor and Bancilhon, 2019). The plan, scope and span of engagement may vary based on differing stakeholders or stages within the due diligence process (OECD, 2016; Taylor and Bancilhon, 2019). Although consulting with internal and external stakeholders when designing engagement activities can highlight potential challenges (e.g. capacity or resource constraints), as well as reveal appropriate solutions or best practices (OECD, 2016). Thus, ensuring that "engagement activities are effective and that potential risks or issues to engagement are anticipated and avoided rather than being dealt with reactively." (OECD, 2016, p. 54).

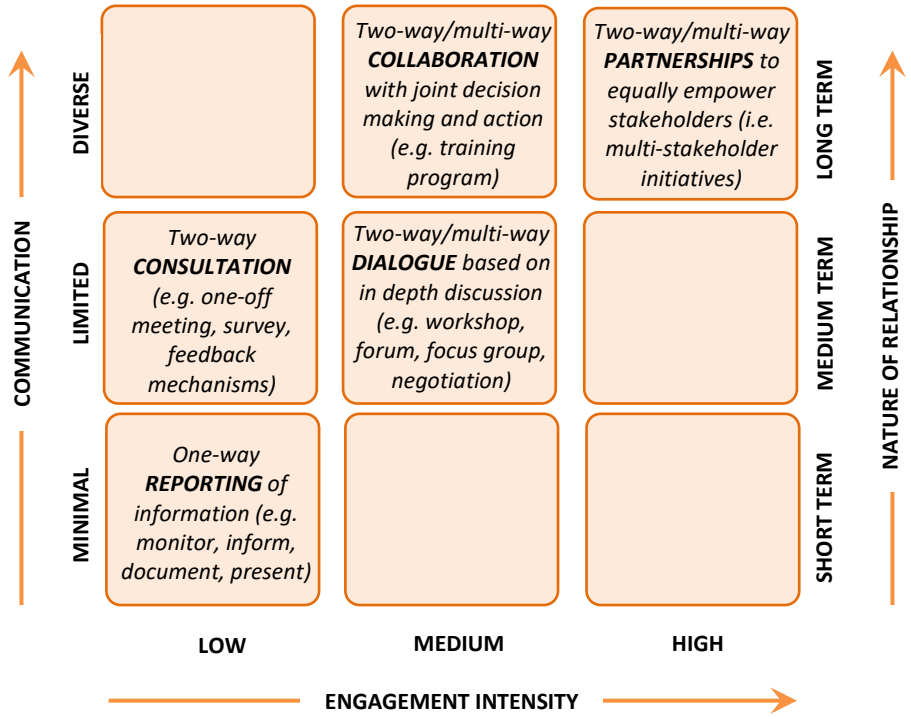


Table 2: Table outlining the different modes of engagement (identified in bold italic font) and examples of related engagement activities (Adapted from IFC, 2007; AccountAbility 2015; OECD, 2016).

Additionally, the engagement itself should seek to create meaningful opportunities for stakeholders to voice grievances and negotiate appropriate remediation (OECD, 2016). To ensure that this process is effective and credible, engagement activities (e.g. a focus group) should be designed and implemented in a way that is *focused* (clear expectations and goals), *timely* (allow time to share perspectives), *representative* (allow perspectives from diverse stakeholder groups), *inclusive* (incorporate vulnerable stakeholders equally), *respectful* (culturally sensitive and accessible), and *transparent* (documentation and disclosure of engagement activities) (OECD, 2016; Taylor and Bancilhon, 2019). Yet, if the mode of engagement is wrong or poorly implemented, engagement may lose momentum as stakeholders feel undervalued, misinformed or misrepresented (GCNG 2014). Hofmann *et al*. (2015) identify that MNCs committed to supply chain due diligence are more likely to engage in direct and collaborative engagement. These more collaborative modes build trust and cooperative relationships with stakeholders, facilitating increased problem solving, capacity building and improved sustainability risk management. In fact, stakeholder engagement has shifted from one-way communication towards more participatory approaches,

reflecting trends for more participatory approaches within environmental governance (Krick *et al.*, 2005; Driessen *et al.*, 2012). However, opportunities for stakeholder engagement and remediation will vary based on a company's specific supply chain risks, location of activities, size, sector, product(s) and business relationships (GNCG 2014; OECD 2013). It should also be noted that the relative costs of engagement increase with more participatory and intensive approaches (Taylor and Bancilhon, 2019).

Step 5: Act, Review and Improve

The purpose of meaningful engagement is to produce positive outcomes for both stakeholders and corporations regarding risk identification and management. In this regard, "clear and functional processes to respond to grievances should be established which allow stakeholders to raise concerns with the enterprise and allow the enterprise to enable mitigation and provide early and direct remedy" (OECD, 2016, p. 59). Although, some sustainability risks should not be directly addressed by corporate grievance mechanisms (e.g. conflict, violence, sexual abuse) but reported to relevant local, national or international organisations (OECD, 2016). Those which can be directly addressed should be incorporated into a remediation action plan[21], defining key roles, commitment and timelines for implementation (Taylor and Bancilhon, 2019). Communicating this plan and its progress as transparently as possible is important, allowing stakeholders to be informed of remediation activities and whether these represent their expectations (Taylor and Bancilhon, 2019). In this context, ongoing engagement with stakeholders can help companies manage stakeholder expectations or address challenges which emerge during remediation, ensuring that remediation is appropriate (OECD, 2016).

While previous steps have focused on building effective strategies for stakeholder engagement and remediation, establishing systems for ongoing and two-way communication is fundamental for long-term relationship building (OECD, 2016; Taylor and Bancilhon, 2019). The OECD (2016) outline that this should be part of a participatory process for monitoring and evaluating stakeholder engagement, providing a means for ensuring engagement activities accomplish their objectives while also empowering stakeholders and building trust. The monitoring of engagement, whether through stakeholder participation and/or external review, provides feedback which should be incorporated into future practices as part of a continual improvement approach (OECD, 2016).

3.2 Effective Mineral Due Diligence

As this thesis has made clear, companies across the mineral value chain have an individual responsibility to conduct due diligence, especially electronics MNCs. Part of this should also involve engaging meaningfully with stakeholders. Yet, due to the various guidelines and frameworks which exist it can be difficult to understand what actions need to be taken as part of responsible mineral sourcing and when. This is compounded by a lack of empirical research on appropriate methods of stakeholder engagement within the specific circumstances of mineral due diligence in high-risk or conflict-affected areas. While guides are available for mineral due diligence (i.e. the Due Diligence Guidance), these do not thoroughly address how stakeholder engagement should be approached. Likewise, stakeholder engagement guides (i.e. the Stakeholder Engagement Guidance) offer comprehensive guidance on engagement as part of due diligence but fail to apply to the unique conditions of mineral due diligence. Yet, the OECD Stakeholder Engagement Guidance and Due Diligence Guidance offer some insight when examined together. The framework shown in Table 3 draws on these guidelines (as well as guidelines established by the GCNG) and outlines how meaningful stakeholder engagement should be implemented as part of an effective mineral due diligence strategy. Ultimately, the ability of companies to achieve this derives from corporate due diligence policies and their outputs. Therefore, Table 3 indicates key opportunities for engagement and appropriate engagement modes which should be integral to corporate due diligence policies. This will be further discussed using the Due Diligence Guidance steps.

[21] "Remediation can come in varying forms including restitution, rehabilitation, compensation, satisfaction and guarantees of non-repetition […] responses may also vary in scope and be individual or collective" (OECD, 2016, p. 60).

Due Diligence Steps	**Policy Outputs**	*Source*
1. Policy Commitment and Integration	Establish and **inform** stakeholders of mineral sourcing policy	*OECD 2016; OCED 2013*
	Consult key stakeholders in developing the commitment/policy	*GCNG 2014*
	Negotiate sustainability commitments with suppliers	*OECD 2016; GCNG 2014; OCED 2013*
2. Identifying and Assessing Supply Chain Risks	**Consultation** with stakeholders to identify risks	*OECD 2016; GCNG 2014; OCED 2013*
	Collaborate with stakeholders as part of risk assessment (i.e. improving supplier due diligence reporting)	*OECD 2016; GCNG 2014; OCED 2013*
	Partnerships with stakeholders as part of ongoing risk monitoring (i.e. grievance mechanisms) and continual improvement	*GCNG 2014; OCED 2013*
3. Design and Implement Risk Management Strategy	Stakeholder **collaboration** to design and implement risk management	*GCNG 2014; OECD 2013*
	Use multi-stakeholder **partnerships** to monitor and track the performance of risk management strategy	*OECD 2016; GCNG 2014; OCED 2013*
4. Third-Party Audit	**Consultation** with independent stakeholders to audit and verify due diligence practices among SORs	*OCED 2016; OECD 2013*
	Collaboration with stakeholders to evaluate due diligence activities and processes	*OECD 2016; GCNG 2014*
5. Reporting	**Report** due diligence results to stakeholders in a format which is accessible and provides adequate channels for responses	*GCNG 2014*

Table 3: Stakeholder engagement opportunities within the OECD stages of mineral due diligence (OECD, 2013). Appropriate modes of engagement have been underlined and highlighted in bold.

Step 1: Policy commitment and management system

Firstly, to demonstrate a commitment to responsible mineral sourcing companies across the GVC should adopt and publicly communicate an appropriate policy which meets internationally recognised standards (OECD, 2013b). Consulting of internal and external stakeholders can enhance policymaking and the development of due diligence processes in several ways, for example, ensuring management support, integrating due diligence procedures into business activities, as well as assigning operational responsibilities and accountability (OECD, 2013b). Consulting external stakeholders also can help ensure policy alignment to responsibility standards and provide awareness of stakeholder values/expectations (OECD, 2013b; GCNG, 2014). Furthermore, a mineral policy should also be supported by internal systems of control and transparency over the mineral supply chain (OECD, 2013). Establishing long-term relationships with suppliers should form a core part of this management system, providing a way of building leverage and trust among suppliers which can be applied when negotiating sustainability parameters into contracts or agreements with suppliers (OECD, 2013b; GCNG, 2014). Yet, to support ongoing due diligence among suppliers, companies should consider collaborative approaches for building capacity and monitoring across the supply chain (GCNG, 2014). Additionally, participation in industry-wide initiatives can provide useful information to support due diligence efforts and increase efficiency (OECD, 2013b, 2016).

Step 2: Identifying and Assessing Supply Chain Risks

Assessing risks in the mineral supply chain requires a supply chain-wide approach, for downstream companies this should focus on identifying and assessing due diligence processes at the SOR-level. In this context, the Due Diligence Guidance outlines that downstream companies should "engage and actively cooperate" (OECD, 2013b, p. 42) with suppliers and industry organisations to disclose upstream actors. To do this, downstream companies should consult suppliers across all tiers of the mineral value chain to gather information on due diligence practices and any potential or actual risks related to mineral sourcing. Likewise, SORs should engage with upstream suppliers to establish the mineral chain of custody to source locations. A key part of this should involve consultation with adversely affected groups and rights-holders, enabling verification of (potential) impacts on-the-ground and areas to prioritise (GCNG, 2014). Here, consultation between downstream companies and SORs is

essential for sharing information on mineral traceability and risks, although more collaborative approaches can be used to build capacity and improve due diligence performance among SORs. Moreover, collaborating with government, industry and/ civil society stakeholders can support capacity building and improve due diligence performance across the mineral value chain (OECD, 2013b). Downstream companies can also directly identify changing/emerging risks in the supply chain by operating a grievance mechanism, allowing stakeholders across the mineral value chain to communicate complaints and provide data on potential risks in the extraction, transport, and trade of minerals (GCNG, 2014). This should be accessible to all stakeholders (including vulnerable groups like ASM miners and other rights-holders), ensuring fair and equal representation of stakeholder groups and covering the full scope of potential risks (OECD, 2013b; GCNG, 2014). Allowing CSOs or industry associations to facilitate grievance mechanisms can increase credibility, while also providing expert support in engaging stakeholders, identifying risks in challenging areas and maintaining data records (GCNG, 2014).

Step 3: Design and Implement Risk Management Strategy

Risk management requires companies to fulfil their responsible mineral policy using internal and external stakeholders to evaluate and respond to risks (OECD, 2013b; GCNG, 2014). Internally companies should build expertise and channels for communicating due diligence information up the chain of command while ensuring responses are integrated into business activities (GCNG, 2014). For example, via a committee responsible for planning, implementing and tracking risk management. Companies must also consider if "identified risks can be mitigated by continuing, suspending or terminating the relationship with suppliers." (OECD 2013, p. 44). However, rather than terminating relationships with non-compliant suppliers, potentially exacerbating upstream impacts, collaborating with suppliers and rights-holders can be used to design and integrate risk management into business relationships. Not only does this incorporate stakeholder needs/expectations into risk management, but it also allows multiple actors to participate in mineral governance and increases regulatory capacity (OECD, 2013b; GCNG, 2014). Civil society and industry stakeholders can also be included to support companies and their suppliers, for example, by information, resources, training, capacity building etc. (OECD, 2013b; GCNG, 2014). Yet, risk management strategy should be adaptive and flexible with the understanding that approaches may need improvement or new risks may emerge. Here, external stakeholders (i.e. CSOs and rights-holders) can provide ongoing input via more proactive engagement, for example via advisory groups or grievance mechanisms (GCNG, 2014). This can provide feedback on due diligence performance, leading to more creative and fit-for-purpose risk management while also increasing the legitimacy, quality, capacity and effectiveness of the company's approach (GCNG, 2014).

Step 4: Third-Party Audit

Step four of the OECD guidance (2013) highlights the responsibility of downstream companies like electronics MNCs to commission independent on-site investigations to verify responsible sourcing practices at the SOR-level, as well as evaluate due diligence processes at the company-level. While this is a somewhat top-down process, collaboration with suppliers can be used to establish a follow-up strategy to address identified risks or improve due diligence. This has the benefit of strengthening trust, improving information gathering/sharing and giving stakeholders a sense of security regarding their business relationship (OECD 2016). Additionally, more participatory methods of engagement in cooperation with governments, industry initiatives and/or CSOs can also be used to provide input to or administer the auditing process (OECD, 2013b). For example, the RMI's voluntary RMAP initiative for mineral certification which increases the cost-effectiveness and credibility of SOR auditing.

Step 5: Reporting

The final stage of the OECD guidance requires MNCs to publicly report due diligence findings and management processes. To ensure that communication is accessible MNCs should consider the length, detail, language, terminology and channels of communication used to report information. It is important to align these with the needs of all stakeholders to ensure both meaningful and effective communication (GCNG 2014). Setting up systems for collaborative engagement or using recognised reporting standards (e.g. GRI or RMI reporting templates) can provide useful feedback on engagement activities and help the management of stakeholder expectations in this regard.

3.3 Assessing practices of Due Diligence and Engagement

Considering the due diligence and stakeholder engagement literature, it is evident that meaningfully engaging with stakeholders enables companies across the mineral value chain to reduce adverse impacts in mining areas while also contributing to positive socio-economic development in these areas. As outlined in Section 3.1, meaningful stakeholder engagement is focused on two-way communication which allows stakeholders to freely and fairly represent their viewpoints, with the intention of reaching a mutual understanding of how stakeholder interests are affected by business activities (OECD, 2016). To be meaningful, there should also be a follow-through strategy on the outcomes of engagement which incorporates stakeholder views and appropriately addresses and/or remedies adverse impacts on stakeholders. For example, by implementing commitments agreed to by the parties (OECD, 2016). Stakeholders should also be engaged to varying degrees of intensity throughout the implementation of the mineral due diligence, as outlined in *Table 3*. This can help companies identify, assess, manage and remedy potential or actual risks in their supply chains as part of an iterative and effective due diligence processes (OECD, 2016). It is also key for ongoing evaluation and adaptation of due diligence processes, as new risks or best practices are identified.

	Policy Outputs
Effective mineral due diligence	Set clear due diligence policy in line with recognised standards (i.e. Due Diligence Guidance)
	Conduct appropriate stakeholder engagement at key opportunities throughout the due diligence process (see *Table 3*)
Meaningful stakeholder engagement in mineral supply chains	Set clear engagement policy in line with recognised standards (i.e. Stakeholder Engagement Guidance)
	Establish clear management responsibilities for engagement
	Research operating context to identify and analyse stakeholder groups
	Set clear, focused and realistic engagement objectives which align to corporate policy
	Ensure stakeholders are informed and information is accessible
	Provide necessary support for stakeholders to be fairly, equally and respectfully represented
	Assign appropriate mode of engagement (see *Table 2*)
	Assign realistic and appropriate engagement timelines
	Stakeholder input when planning engagement activities
	Establish a transparent remediation process which incorporates stakeholder concerns
	Develop ongoing monitoring and evaluation mechanisms incorporating stakeholders

Table 4: Appropriate corporate policy outputs for meaningful stakeholder engagement and effective due diligence in mineral supply chains. Indicators for these explanatory factors are shown in Table 5 (Adapted from OECD 2013; 2016)

Furthermore, appropriately engaging stakeholders at key opportunities throughout the mineral due diligence process is vital for incorporating the viewpoints and abilities of stakeholders, resulting in more effective and sustainable mineral sourcing. To understand the factors which underpin successful corporate policies in this regard, literature from Section 3.1 and Section 3.2 has been used to develop the policy outputs in *Table 4*. The purpose of this is to conceptualise how meaningful engagement can be designed and implemented via corporate policy and its outputs (regulations, tools etc.) as part of effective mineral due diligence and, overall, how this can accomplish and/or improve responsible sourcing practices in the mineral value chain. The conceptual model shown in *Figure 13* demonstrates the causal relationships between corporate policy *outputs*, *policy outcomes* (i.e. effects on stakeholders), and the influence of policy outcomes on the *end-outcome* (i.e. sustainable mineral supply chains).

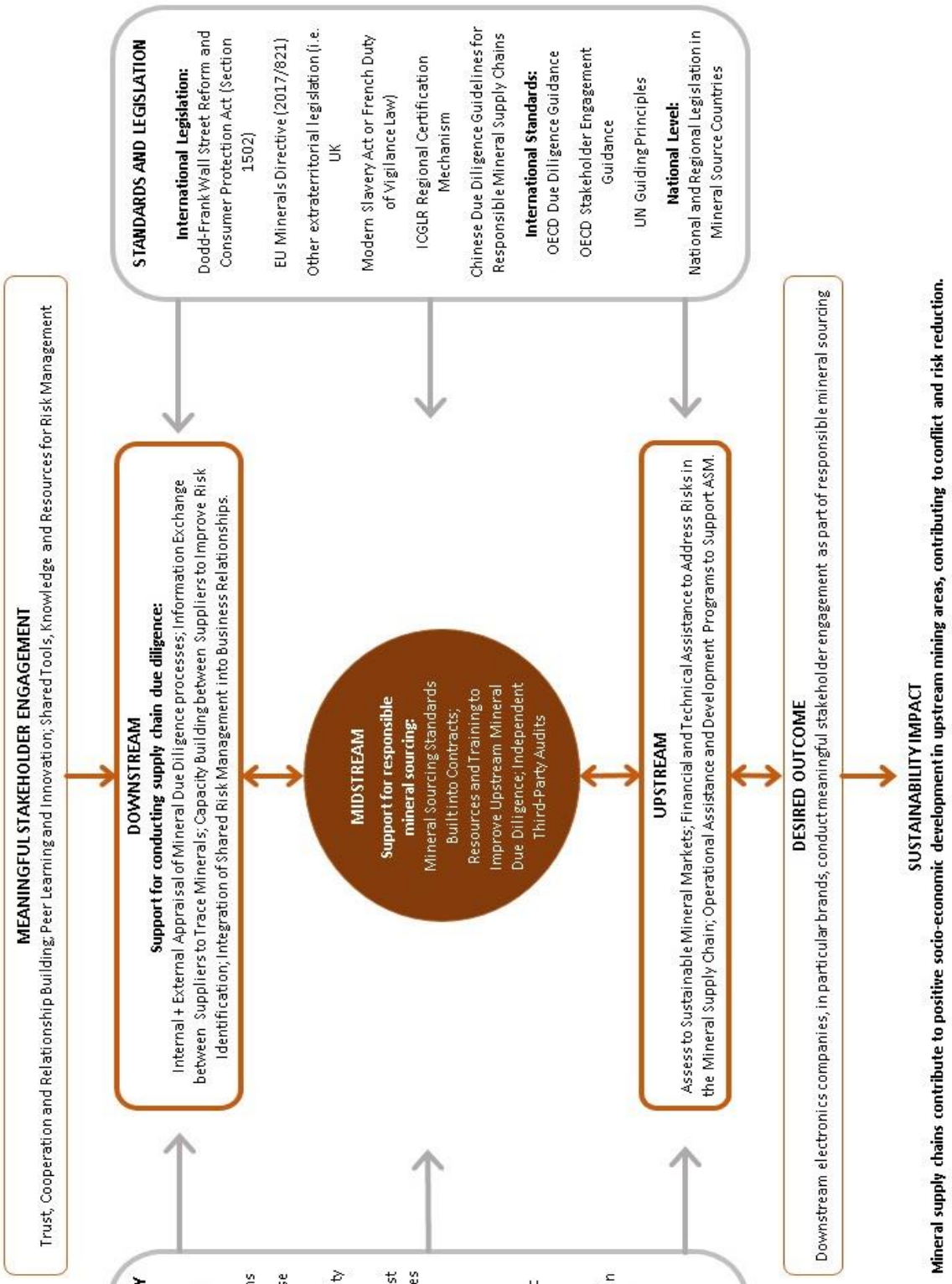


Figure 13: Conceptual model for meaningful stakeholder engagement and its implementation in effective mineral due diligence. Directional arrows represent engagement between specific stakeholders.

4. Methodology

4.1 Research Design

Following the research framework in Section 1.6 (*Figure 3*), this thesis aims to identify how downstream MNCs in the electronics industry implement due diligence in mineral supply chains. Focusing on analysing and comparing how these companies plan, conduct and respond to stakeholder engagement. Moreover, internal and external influences on stakeholder engagement (at the corporate-level) will be assessed to determine factors which act as barriers to meaningful engagement, as well as those which promote meaningful engagement. To investigate stakeholder engagement in this way an inductive multiple case study approach was chosen, involving a representative selection of electronics companies. This was chosen for a number of reasons: (1) research on due diligence and stakeholder engagement lacks empirical research with only a few published articles (e.g. GCNG, 2014; OECD, 2016); (2) case study research lends itself to detailed empirical study of complex phenomena like stakeholder engagement; (3) case study research is suited to the investigation and comparison of various organisational situations; (4) researching multiple cases allows for triangulation of data and moderates social desirability bias which is inherent in research of this topic (Hofmann *et al*. 2015).

Within this case study research, various methodological approaches were employed. Firstly, publicly available corporate reports (e.g. sustainability, CSR, mineral disclosure, policy documents) were used to collect data on stakeholder engagement and due diligence practices within case study companies. This was supported by a survey conducted among case studies to incorporate first-hand perspectives on corporate stakeholder engagement. The aim of this was to identify and understand how companies implement stakeholder engagement as part of mineral due diligence, as well as the main explanatory factors influencing the level of success. Here, an in-depth analysis of each case study was used to disclose the various policy outputs with which engagement is implemented (independent variables). These were then compared to the model policy outputs established in *Table 4*, enabling the researcher to analyse how corporate policies influence overall sustainability in mineral supply chains (dependent variable). To do this an extant literature review was used to operationalise meaningful engagement and effective due diligence (shown by the assessment criteria in *Table 5*), as well as to conceptualise the causal relationships between meaningful engagement and sustainable mineral supply chains (shown in *Figure 13*). In addition, consultation with industry, academic and civil society experts in the field was used to verify findings and ground them in the wider debate surrounding topics such as supply chain due diligence, corporate governance, collective action etc.

Here, it should be noted that sustainability is a highly interpretive and contested concept within and between academic, political and market arenas (Vermeulen, 2018). Yet, in this thesis, sustainability is understood using the concept of People, Planet, and Prosperity (PPP). While this framing of sustainability is not completely holistic, it emphasises social, environmental and economic development and echoes multilateral frameworks like the UN sustainable development goals (SDGs). It is also important to note that 'electronics MNC' will refer to electronic brand companies, as the main focus of case studies in this thesis. The term 'downstream electronics company' will refer to all downstream companies in the mineral value chain (e.g. contract manufacturer, original equipment manufacturer). On top of this, the phrases 'global' and 'mineral value chain' are both used to refer to the overall mineral lifecycle from raw material extraction, smelting and disposal.

4.2 Case Selection

This study concentrates on the electronics industry, rather than similar industries impacted by unsustainable minerals (e.g. automotive, aerospace, jewellery). However, the electronics industry was chosen as it represents a leading sector, not just regarding its use of minerals in consumer goods but also the adoption of mineral sustainability programs like the Due Diligence Guidance (Callaway, 2017; Deberdt and Jurewicz, 2018; KnowTheChain, 2018). Yet, conceptions of the term 'electronic' can be inconstant and vague, giving rise to a range of companies, products and metals which could be considered. However, this thesis follows the accepted definition of electronics as technological devices which use electrical charge in logic circuits to perform complex functions,

		Policy outputs	*Assessment criteria*
Effective mineral due diligence	*Policy*	1. Set clear due diligence policy in line with recognised standards (i.e. Due Diligence Guidance)	*1.1) Appropriate due diligence policy commitment* *1.2) Degree to which corporate policies are accessible* *1.3) Internal/external stakeholder incorporation into policy development* *1.4) Incorporation of mineral due diligence standards/guides*
	Impem-entation	2. Conduct appropriate stakeholder engagement at key opportunities throughout the due diligence process	*2.1) Number of engagement opportunities used within the OECD due diligence stages (see Table 3 for assessment criteria)*
Meaningful stakeholder engagement	*Engagement Strategy*	3. Set clear engagement policy in line with recognised standards (i.e. Stakeholder Engagement Guidance)	*3.1) Appropriate engagement policy commitment* *3.2) Degree to which corporate policies are accessible* *3.3) Internal/external stakeholder incorporation into policy development* *3.4) Incorporation of stakeholder engagement standards/guides*
		4. Establish clear management responsibilities for engagement	*4.1) Internal allocation of management responsibility for engagement (i.e. engagement team or committee)* *4.2) Internal assignment of accountability for engagement management (i.e. senior staff)*
	Identify + Analyse Stakeholders	5. Research operating context to identify and analyse stakeholder groups	*5.1) Diversity and quality of sources/tools used to research the supply chain and potential business impacts* *5.2) Criteria used to assess stakeholder groups (i.e. vulnerability)*
	Plan Engagement	6. Set appropriate engagement objectives	*6.1) Degree to which objectives are accessible, focused on stakeholder needs, aligned with corporate policy and international standards*
		7. Ensure stakeholders are informed	*7.1) Timely provision of relevant information with stakeholders before engagement* *7.2) Degree to which shared information is clear, in an accessible format, and accurate*
	Implement Meaningful Engagement	8. Assign appropriate mode of engagement (see *Table 2*)	*8.1) Matching appropriate engagement mode to the plan, scope and stakeholder group(s) involved in engagement*
		9. Provide necessary support for stakeholders to be fairly, equally and respectfully represented	*9.1) Processes in place to support open and equal stakeholder representation (e.g. financial and logistical support.)* *9.2) Processes in place to ensure cultural sensitivity during the engagement (e.g. internal training, resource allocation.)*
		10. Assign realistic and appropriate engagement timelines	*10.1) Stakeholders are provided with sufficient time and flexibility to plan engagement activities and represent their perspective*
	Act, Review and Improve	11. Establish a transparent remediation process which incorporates stakeholder concerns	*11.1) Reporting of engagement activities and remediation plans back to stakeholders* *11.2) Stakeholder consultation to ensure their concerns are adequately addressed/incorporated into follow-up remediation planning*
		12. Develop ongoing monitoring and evaluation mechanisms incorporating stakeholders	*12.1) Internal processes for monitoring and evaluating engagement* *12.2) Incorporation of stakeholders into ongoing engagement monitoring and evaluation*

Table 5: Policy outputs and assessment criteria for meaningful stakeholder engagement and effective mineral due diligence.

from data storage, mathematical process, and communications purposes. This includes computers, laptops, mobile phones, tablets, games consoles and televisions (often referred to as 'brown goods'). This is opposed to 'electrical' devices which use electricity for a basic function (e.g. as a power source) and are not included in this study. For example, lighting, heaters, power tools and kitchen appliances (referred to as 'white goods'). Although, it is worth noting that electrical devices are taking on ever more complex functions as technologies become more diverse, smaller and cheaper to produce, blurring the line between 'electrical' and 'electronic'. For example, Wi-Fi enabled light bulbs and kitchen appliances.

Cases chosen for this study are all electronics MNCs, however, the decision was also made to focus specifically on consumer electronics brands (i.e. companies which produce electronics for personal use rather than commercial or industrial purposes). This made sense for investigating responsible mineral sourcing because brand companies, as mineral end-users, have a responsibility to conduct due diligence across the supply chain and inform stakeholders about the sustainability impacts of their electronic devices. Generally, brand companies also have their headquarters in home states where these responsibilities are embedded within government legislation and corporate norms, as discussed in Section 2.2.3. This means that brand companies are more likely (compared to companies further up the mineral value chain) to conduct due diligence, as well as more likely to make this information publicly available (i.e. through corporate reports). Thus, making electronics brand companies the most suitable actors in the GVC for comparing and analysing stakeholder engagement practices[22]. Consumer electronics brands are also a logical focal point for this study given that they are highly influential actors in the mineral value chain, as well as being publicly recognisable and internally conscious of expectations among stakeholders.

To develop a sampling frame of electronic brands a diverse selection technique was used, echoing Hofmann *et al*. (2015). This scope suits detailed research of the case studies while also providing enough breath to enable comparison of corporate practices. An initial review of corporate websites provided the foundation for developing this sampling frame. This was used to gain an insight into the electronics industry and build a database of 80 case studies, as shown in *Appendix 7*. However, the initial sample of 80 electronics brands was further refined to produce a manageable range of case studies for a more detailed analysis of stakeholder engagement. This process involved a further review of corporate due diligence documents, policies and website information to investigate case studies most applicable for this study (also shown in *Appendix 7).* Adherence to the Due Diligence Guidance was used as the main selection criteria for the final case studies, this was chosen for several logical reasons: 1) it is one of the most widely adopted frameworks for responsible mineral guidance, covering all minerals linked to sustainability risks on a global scale rather than just specific high-risk areas like the DRC; 2) companies that implement the Due Diligence Guidance will generally conduct and report on stakeholder engagement practices, either as part of the due diligence process or independently; 3) finally, by ensuring all case studies implement the Due Diligence Guidance, corporate practices can be easily compared to the explanatory factors in Table 4. Thus, the Due Diligence Guidance was used as a minimum standard for case selection to facilitate data collection, as well as the comparison and analysis of stakeholder engagement practices. Although, Deberdt and Jurewicz (2018) argue that corporate mineral due diligence lacks long-term planning and consistency, particularly due to political uncertainty surrounding policies like the Dodd-Frank Act. Therefore, only up-to-date due diligence information since **2017** was considered. Furthermore, to enable the comparison of engagement practices between companies case selection was designed to ensure varying and contrasting performance regarding responsible mineral sourcing, while also utilising academic research comparing corporate performance on mineral sourcing and due diligence (e.g. The Enough Project, 2010; Amnesty International, 2017; Deberdt and Jurewicz, 2018). A final selection of **35** brand companies is used in this thesis for analysis of stakeholder engagement and mineral due diligence practices.

[22] It should be noted that many electronic brand companies outsource the whole production process to contract manufacturers or OEMs who oversee and delegate manufacturing and assembly processes. For example, brands such as Apple, Huawei, Dell and Google outsource to companies like Foxconn. In addition, some electronics brands produce electronics under their own brand(s) but also act as contract manufacturers/OEMs for other companies (i.e. Funai and Hisense)

4.3 Data Collection

4.3.1 Literature Review

A preliminary and exploratory literature review was conducted to collect secondary data on electronics brands, enabling the initial selection of 80 case studies in the electronics industry. This focused on the following data: *company name*, *branded products*, *position in the GVC*, *market cap*, *location of corporate headquarters* and *corporate contact information*. Publicly accessible information on corporate websites was used to gather this information and assess the viability of companies for inclusion in this research. Moreover, this selection process attempted to incorporate a range of perspectives by selecting companies with varying geographic, economic and product characteristics. A global scope was also necessary given the limited number of electronic brands available for study, providing a more diverse and holistic picture of contrasting mineral governance approaches.

A subsequent evaluative review of supply chain due diligence practices among the 80 case studies was conducted, aiming to gain insight into corporate due diligence practices and refine the selected cases to a manageable number for detailed investigation. Information about corporate due diligence practices and initiatives was accessed using a range of sources, including company websites, CSR/supply chain/sustainability reports, codes of conduct and mineral/supply chain/supplier policies. Within these corporate reports, frameworks such as the GRI sustainability reporting guidance allowed for a more structured approach to data collection on mineral sourcing and stakeholder engagement practices among some case studies. Additionally, the US SEC online database of company filings was also useful for gathering conflict mineral disclosure reports. This was a logical choice given that most electronics brands are either obligated to report on mineral due diligence (due to being a registered company in the US) or do so voluntary as a CSR measure. Thus, offering easily accessible data on how companies implement due diligence in mineral supply chains, as well as how these companies identify, engage with, and manage their stakeholders to eliminate sustainability risks (i.e. suppliers and industry associations). Case studies within this dataset were logged in a database, which was used to store qualitative corporate data gathered from the literature including case study characteristics, contact details (for the survey), as well as the case selection process. Importantly, data on due diligence and stakeholder engagement practices were also noted in this database as well as how and where they were extracted, which is elaborated on in Section 4.4.

Furthermore, academic literature and investigative reports by advocacy groups were systematically reviewed, contextualising the environment in which responsible mineral sourcing takes place. In doing so, literature provided substantive theoretical and methodological contributions to critical analysis of key topics like mineral governance, supply chain due diligence and stakeholder engagement (as outlined in Section 2), as well as broader sustainability governance topics. This laid the foundations for assessing corporate engagement practices (shown in *Table 5*), as well as critical analysis of the factors which influence meaningful engagement at the corporate-level. To gather this academic literature, online bibliographic databases such as Scopus and Google Scholar were used. Relevant keywords and commands were used as selection criteria to find literature, including; “sustainable mineral governance OR supply chains”, “responsible mineral sourcing” and “minerals and supply chain due diligence OR stakeholder engagement”. This yielded manageable results and lead to certain journals as hotspots for literature (e.g. Journal of Cleaner Production, Corporate Social Responsibility and Environmental Management, Regulation and Governance). Additionally, various international organisations and CSOs publish research on mineral due diligence and stakeholder engagement topics, for example, Amnesty International, Global Witness, The Enough Project, and the OECD. Within this literature, electronics governance was addressed from differing sustainability angles including conflict minerals, labour conditions, supply chain management and CSR. Given the interrelated nature of governance issues in GVCs, many papers were too broad in scope and excluded. Others tended to focus on investigating sustainability concerns, theorising or providing guidance rather than analysing governance itself (although papers such the Due Diligence Guidance were not excluded for obvious reasons). Moreover, civil society and government reports often lacked an empirical scientific methodology, making them inappropriate in this study. While literature in this thesis does not include all mineral governance literature, the aim was to identify, appraise and synthesise high-quality research and arguments relevant to address the research objective/questions.

4.3.2 Corporate Survey

To incorporate first-hand corporate perspectives regarding stakeholder engagement practices, a survey was conducted among case studies during May 2019. Given that survey completion was expected to be low, the survey was conducted among all initial 80 case studies. Although this incorporates companies that do not meet the Due Diligence Guidance standards, this wide sample was chosen to allow all companies to report their experiences in implementing mineral due diligence. Therefore, generating a more complete image of the factors which enhance and/or impede stakeholder engagement as part of this.

The survey was directed at managerial staff in the sustainability or CSR departments, showcasing the expertise and specialist knowledge needed to conduct due diligence/stakeholder engagement while also ensuring comparability between cases. Participants were initially approached via email using corporate emails or online contact/query forms, these were accessed on corporate websites. Although, a total of 10 case studies did not list suitable contact information and therefore could not be included in this survey. Questions were designed based on the indicators in Table 5 and took the form of multiple-choice questions to ensure the survey was simple and quick to complete (see *Appendix 5* for survey questions). This also had the intention of not deterring participants, particularly given corporate pressures on time and resources. However, as this is a qualitative study the questions were designed in a way that written responses could be made at the participant's discretion. Such an approach was chosen as it is flexible and allows participants to describe complex abstract principles such as 'successful stakeholder engagement' and enables contextual examples to be made (for example of factors which influence stakeholder engagement). Surveys were created using Survey Monkey, a cloud-based software. Participants were contacted with a link to this survey via email, which also gave brief details of the survey and its intentions (see *Appendix 6* for the email to case studies). To follow up this survey, a shorter and more condensed version was also emailed to case studies to encourage non-respondents to participate. Finally, survey responses and notes were stored in the case study database, alongside other corporate data.

4.3.3 Expert Consultation

To strengthen the data collected via literature and the case study survey, experts the field of mineral due diligence and responsible mineral sourcing were contacted regarding participation in a discussion on these topics. The purpose of these consultations was to triangulate data and determining the overall validity and reliability of the claims extracted from corporate literature and surveying. While also mitigating the social desirability bias which is inherent in this subject according to Hofmann *et al*. (2015). On average interviews lasted 1 hour 20 minutes and were conducted by the researcher via email, telephone or web-based video communication. An interview protocol regarding interview procedure and recording was developed and followed to ensure reliability, this included standardised questions for interviewees and a transcript recording process for interview dialogue. A database of notes was created to store discussion transcripts and email conversations. This data provides a broader and more holistic insight into sustainability governance in the mineral value chain, allowing incorporation of wider perspectives into the research, with varying geographic, economic, political and demographic characteristics to support and build upon results. Furthermore, to ensure equal representation, academic, industry, civil society and government organisations were approached. Researcher links to CSOs like the GoodElectronics Network and research groups like the Business, Human Rights and Environment Research Group facilitated this.

4.4 Data Coding

As discussed, data was collected via expert interviews, corporate surveys and using corporate documents gathered during the initial literature review (i.e. documents relating to corporate sustainability, supply chain management, mineral due diligence, social responsibility etc.). Primary and secondary data collected using these methods was collectively stored in a case study database (see *Supporting Documents*). This collected data was then systematically analysed by applying qualitative content analysis (Hofmann *et al.*, 2015) and was conducted using codes developed to reflect the assessment criteria in *Table 5*. The purpose of this was to extract corporate values, policies and policy outputs (independent variables) regarding stakeholder engagement and mineral due diligence. Thus, enabling the comparison and analysis of differing approaches to the assessment criteria.

Data coding is a credible methodology for interpreting qualitative data and is used widely within empiric literature across the social sciences. This approach was a logical methodology due to the analysis of transcripts and other textual documents within this thesis, which contain a large volume of information. Here, coding was ideally suited to extracting and condensing relevant information into key variables for analysis. This approach was also selected to overcome the subjective and interpretive nature of qualitative data, particularly corporate sustainability documents which are often used as a marketing tool to publicise companies' activities in a certain way. Additionally, coding helped to avoid the introduction of assumptions within the research based on the author's own beliefs, values, experiences etc. It is also worth noting that the quality and accuracy of corporate documents and reports vary between companies, this was apparent in the levels of corporate transparency on practices like mineral due diligence. Within this, coding focused on available information and all case studies where given the opportunity to provide more detailed responses within the survey.

The coding process itself was conducted independently before any comparison and analysis of data. Within this, descriptive coding was used to initially identify key variables within the collected data (open coding), these variables took the form of implicit and explicit claims made by the interviewee or within corporate documents (Verschuren and Doorewaard, 2010). By doing this, key variables were systematically extracted from interview transcripts and corporate documents then used to develop a database of information for each case study based on the assessment criteria (see *Supporting Documents*). For the survey results, coding was a more simple task as the survey questions themselves were tailored to the assessment criteria (as shown in *Appendix 6*). Finally, axial coding was applied to transform descriptive codes into more abstract concepts, which were used to condense and categorise variables (Verschuren and Doorewaard, 2010; Hofmann *et al.*, 2015). Furthermore, similar codes were grouped into themes and overarching dimensions. This enabled critical analysis of engagement success within each case study, as well as the comparison of case studies.

5. Analysis of Electronics Case Studies

Firstly, this thesis broadly examines the characteristics of all 80 electronics brands to better understand the electronics industry and provide the context for a more in-depth analysis of corporate mineral sourcing and stakeholder engagement among the 35 case study companies.

5.1 Introduction to Case Studies

Initial analysis reaffirms that this is an industry dominated by ubiquitous brand companies concentrated in countries like the US, Japan and China (Figure 14). Although, 18 US companies including firms like Apple, Alphabet (Google) and Microsoft eclipse the rest of the electronics industry and are valued at US$4.4 trillion. This equates to 80% of the total market capitalization for all 80 electronics case studies, which are collectively valued at US$5.5 trillion (Figure 15). To put this figure into perspective, the US government's federal budget in 2018 was US$4.1 trillion (KnowTheChain, 2018). Thus, highlighting the considerable resources and purchasing power available to electronics brands and their ability to govern the mineral value chain, as well as the role of governments (particularly in the US) in promoting sustainable practices among a relatively small number of large electronics MNCs. Yet, the concentration of electronics brands in certain countries creates problems for managing sustainability risks, which disproportionately occur in developing countries (particularly the Great Lakes Region of Africa). This disparity may result in some risks receiving less attention due to 'western' biases or difficulty relaying information between upstream and downstream actors in distant countries, particularly due to the complexity and concealed nature of risks at certain stages of the mineral value chain.

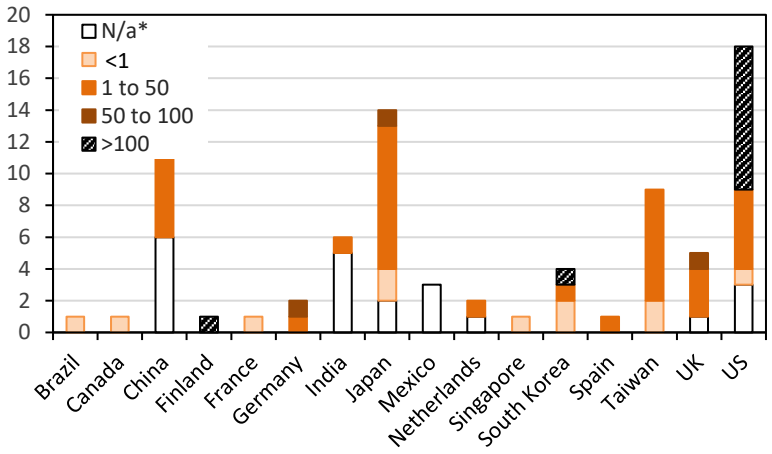


Figure 14: Market capitalisation (US$ billions) of electronic brands (1-80) in relation to country of corporate headquarters. (*market cap. value could not be distinguished for all companies due to differences in financial reporting, particularly in China, India and Mexico).

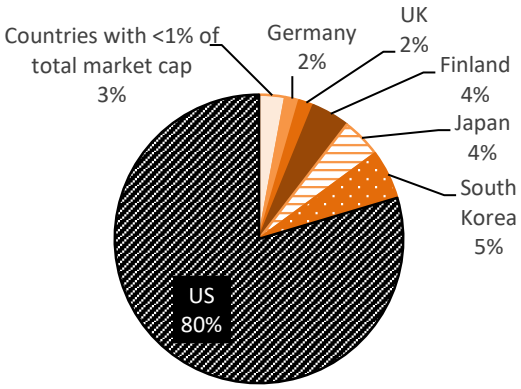


Figure 15: Market capitalisation (% of total) of electronic brands (1-80) by country of corporate headquarters.

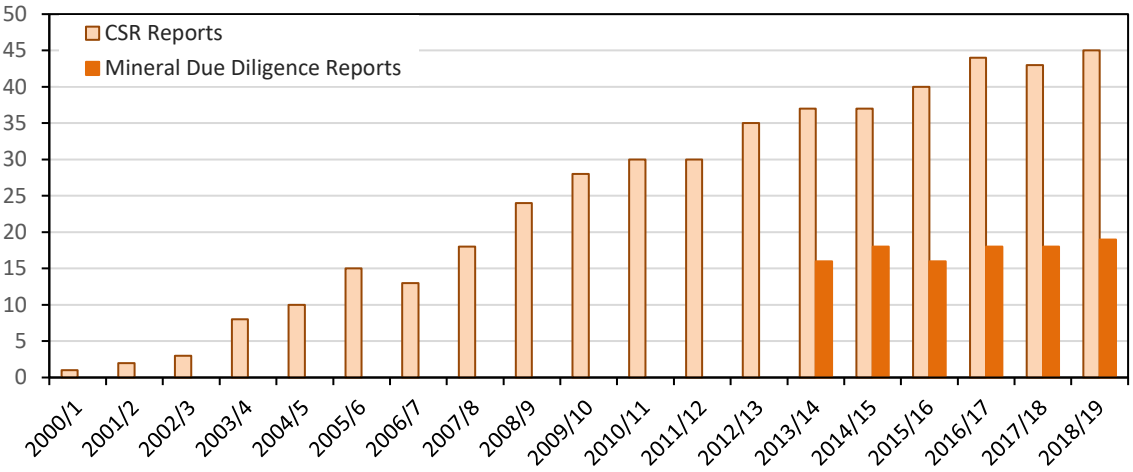


Figure 16: Number of CSR reports and mineral due diligence reports submitted by electronics brands (1-80) per year (2000-2019).

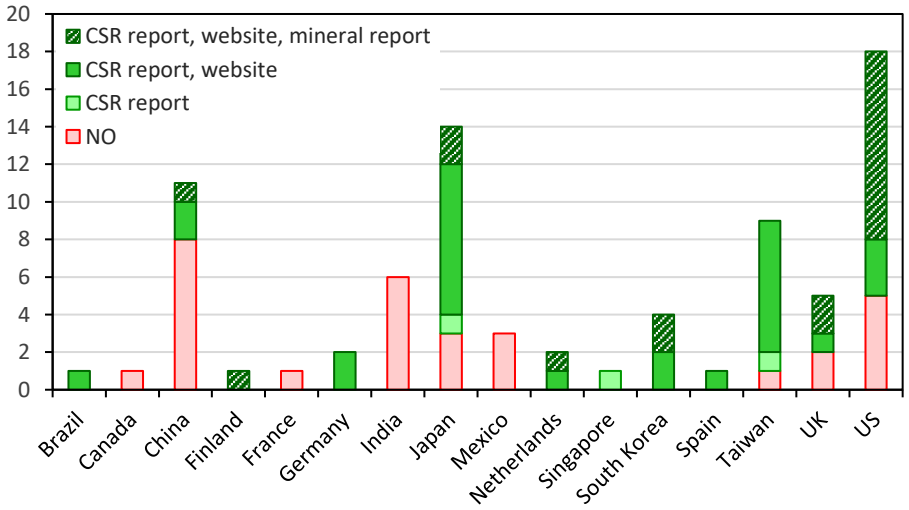


Figure 17: Modes used by electronic brands (1-80) to publicly report CSR and mineral due diligence in relation to country of headquarters. (CSR reports/websites often include mineral due diligence information, though this is generally less detailed than dedicated reports).

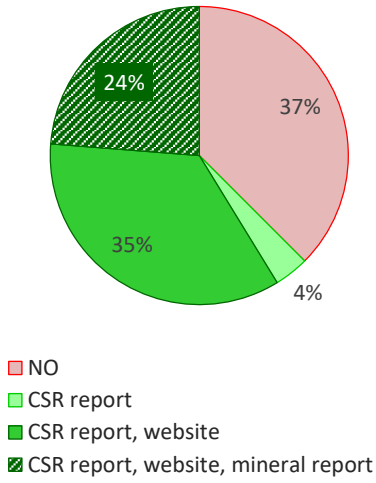


Figure 18: Modes employed by electronic brands (1-80) to publicly report CSR and mineral due diligence.

The analysis also shows a changing landscape of corporate sustainability between 2000-2019, with electronics brands increasingly adopting CSR reporting practices since 2000 (Figure 16). The critical role of governments in developing corporate sustainability legislation is also demonstrated in the rapid growth of publicly available mineral due diligence reports from 2013. This is most likely a consequence of the Dodd-Frank Act enacted by the US in 2010, as roughly of the half mineral reporting companies (10 out of 19) are headquartered in the US (Figure 17). Despite this, it is clear that not all electronics brands report publicly on sustainability, with 37% (30 out of 80) failing to do so and only 24% (19 out of 80) reporting on mineral due diligence (Figure 18). This reflects varying commitments and motivations regarding sustainability within the industry, which is also evident in the differences reporting sustainability between different countries. For example, companies headquartered in developed countries perform better than those in less developed regions, for example, China, India and Mexico are among the worst-performing. Despite this, some companies headquartered in more developed countries like the US, UK, Japan and France still fail to report on CSR, despite stricter extraterritorial and corporate transparency regulation in these countries.

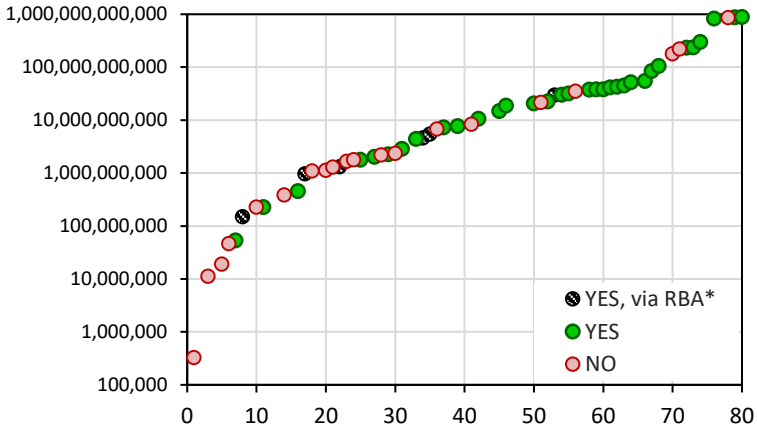


Figure 19: Electronics brand (1-80) adherence to the OECD Due Diligence Guidance based on market capitalisation (US$). (*only includes RBA members which do not specify other frameworks for responsible mineral sourcing).

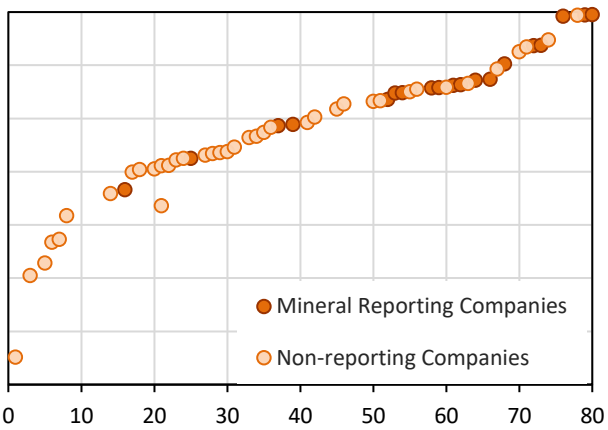


Figure 20: Electronics brand (1-80) which submit mineral due diligence reports based on market capitalisation (US$).

However, this inertia regarding the uptake of supply chain sustainability within the electronics industry is influenced by a range of exogenous and endogenous variables at the corporate-level. For example, there is a clear relationship between company size (market cap) and adherence to the Due Diligence Guidance (Figure 19), as well as mineral reporting efforts (Figure 20). Here, smaller electronics firms may lack the technical and financial resources with which to plan and implement supply chain sustainability measures, or are located in areas with less stringent sustainability requirements and with less public pressure for sustainability (Law and Gunasekaran, 2012; Wittstruck and Teuteberg, 2012). To reduce this inertia, electronics industry associations like the RBA have a role in minimizing potential barriers and costs involved in supply chain sustainability, as well as encouraging improvement in sustainability performance across the industry. This is (to an extent) evident in the role of the RBA code of conduct in establishing sustainability standards among some mid-size electronics brands (Figure 19).

In summary, there are varying understandings of sustainability and ways of reporting CSR among electronics brands, which is reflected in research on corporate sustainability reporting (e.g. Corporate Human Rights Benchmark, 2017; KnowTheChain, 2018) and mineral due diligence (e.g. Callaway, 2017; Deberdt and Jurewicz, 2018). This data also suggests that large electronics companies like HP, Apple, Alphabet, Microsoft and Intel are leading the industry regarding mineral initiatives, despite some variations on performance year-to-year (Callaway, 2017; Deberdt and Jurewicz, 2018; KnowTheChain, 2018). However, mineral governance takes place in a complex institutional setting, involving multiple actors (directly or indirectly) in varying governance arrangements and with differing (potentially competing) agendas. Therefore, to evaluate the overall effectiveness of sustainability governance in the mineral value chain, more in-depth analysis is needed to focus on due diligence and stakeholder engagement practices among the 35 selected electronics case studies.

5.2 Mineral Due Diligence Effectiveness

The following section analyses how the 35 electronics case studies plan and implement mineral due diligence, focusing on the 2 policy outputs outlined in Table 5 which contribute to effective mineral due diligence at the corporate-level. Various assessment criteria are outlined in Table 3 and will be used to assess the case study data. The purpose of this is not to rank case studies based on their performance but to analyse and compare how these policy outputs are implemented by case study companies.

Policy Output 1: Set clear due diligence policy

The first due diligence step requires adopting a public policy commitment to responsible mineral sourcing, which is fundamental for the allocation of internal responsibilities, resources and procedures for supply chain sustainability (Wittstruck and Teuteberg, 2012; Dobele *et al*., 2014). Case study data shows that all 35 case studies have publicly accessible policies for supply chain sustainability, whether that be a stand-alone policy; part of a broader company code of conduct; or part of specific human rights, supply chain or procurement policy. All case studies also publicly report CSR policies and responsible mineral sourcing practices, often using multiple platforms and publishing in various languages. Therefore, based on assessment criteria 1.1 and 1.2, all 35 companies can be understood as having an accessible mineral policy. Although linguistic and technological barriers to assessing this information may apply to some stakeholders, most likely among poorer communities in developing countries (e.g. those without internet access). It is also this group of stakeholders which are more likely to be directly and adversely affected by mineral-related sustainability risks.

Figure 21: Actors engaged by case studies as part of policy development

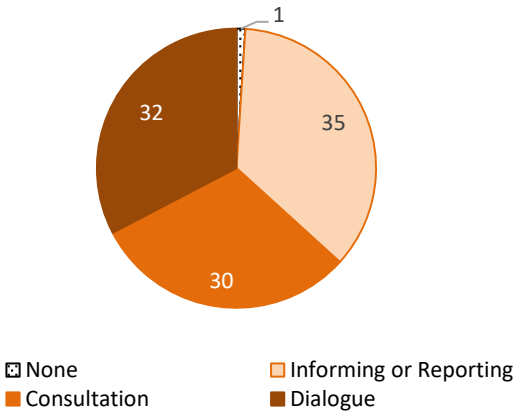


Figure 22: Main modes used by case studies for engaging stakeholders in policy development

In analysing assessment criteria 1.3, data shows that all case studies include stakeholders in policy development, which can play a key role in ensuring representation of all stakeholders (and their needs) within corporate policy (Nawrocka, 2008; Lee and Kim, 2011; Wittstruck and Teuteberg, 2012). However, there are clear differences regarding which stakeholder groups are involved and how they are engaged (as shown in Figure 21 and 22). For example, the public is among the most widely engaged actor by 33 case studies. Although, this tends to be a low-intensity engagement focusing on public surveys and similar feedback channels. In comparison, management staff are engaged by 29 case studies but via more ongoing forms of dialogue as part of coordinating internal policy development. A small number of proactive companies also seek to engage industry, civil society and state actors, including suppliers (6), industry associations (5), governments (4), international organizations (4) and independent experts (4), CSOs (3), consumers (2) and stakeholders on-the-ground (1). Within this, two-way communication such as dialogue is important for exchanging more complex information with relevant stakeholders, supporting more informed and effective policies (Wittstruck and Teuteberg, 2012; Hofmann *et al.*, 2015). Here, 32 case studies engage in two-way communication as part of policy development, although this is predominantly with internal stakeholders (e.g. management staff). Only 8 case studies conduct two-way engagement with supply chain actors like suppliers and industry associations, while 6 engage independent stakeholders like CSOs, independent experts, international organisations and government departments.

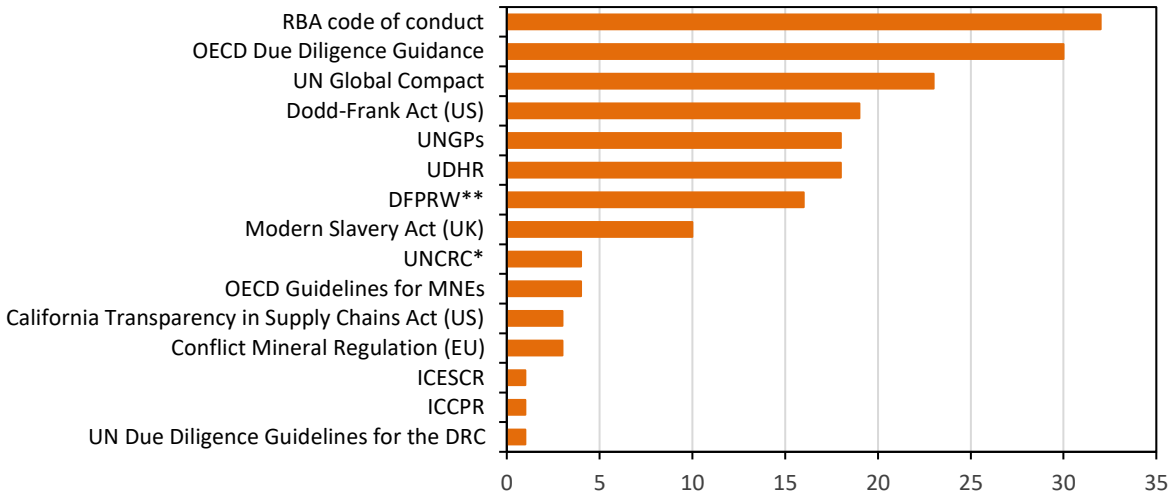


Figure 23: Number of international sustainability frameworks incorporated into mineral sourcing policy among case studies. (*UNCRC refers to the UN Convention on the Rights of the Child; ** DFPRW refers to the ILO's Declaration of Fundamental Principles and Rights at Work)

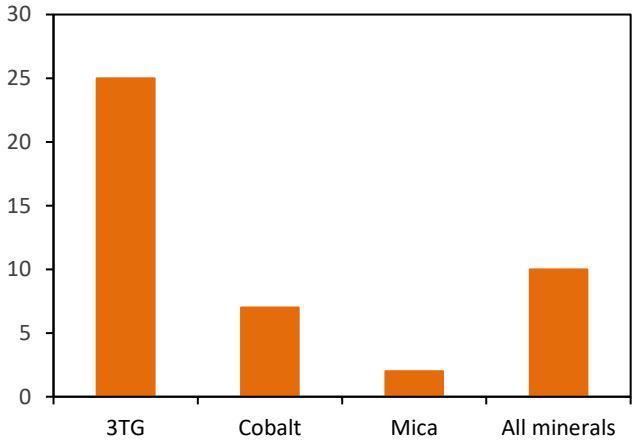


Figure 24: Minerals incorporated into case study mineral policies

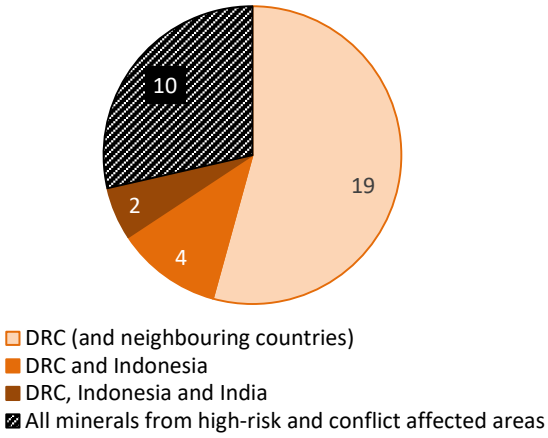


Figure 25: Countries incorporated into case study mineral policies

Finally, in analysing assessment criteria 1.4, the data in Figure 23 shows that various international sustainability frameworks are incorporated into corporate policies. The most comprehensive of these for mineral sustainability in high-risk areas is OECD Due Diligence Guidance, which has been adopted by 30 case studies. Yet, frameworks like the RBA code of conduct, US Dodd-Frank Act and UNGPs also contain provisions for (or references to) the Due Diligence Guidance and are included in corporate policy by 33, 18 and 17 case studies respectively. Other frameworks like the UN Global Compact, UDHR, Modern Slavery Act are also used by 23, 17 and 10 case studies but focus on broader sustainability issues and are less applicable to mineral supply chains specifically. However, the level of commitment and compliance to sustainability varies between companies throughout the electronics industry. As shown in Figure 24 and 25, all companies incorporate 3TG from the DRC and Great Lakes Region into policy, highlighting the significance of mineral risks in this region and the success of manoeuvring these risks onto the agenda of corporate policymakers. Although this is somewhat of a minimum standard for the industry and frameworks like the Due Diligence Guidance highlight the need to incorporate 'all minerals and high-risk/conflict-affected areas', which is only achieved by 10 case studies. In comparison, 19 case studies focus solely on high profile sustainability risks such as 3TG from the DRC.

Policy Output 2: Conduct appropriate engagement within the due diligence process

As outlined in Table 5, the assessment of policy output 2 focuses on analysing how case study companies engage with stakeholders as part of the 5 steps of mineral due diligence based on assessment criteria 2.1 in Table 3. This analysis will focus on stages 2-5 of the mineral due diligence, as stage 1 has been evaluated as part of assessing policy output 1 in the previous section.

Firstly, case study companies all conduct reasonable country of origin inquiries (RCOI) to gather data on mineral sources based on SORs and/or the country/mine of origin, as well as to identify potential risks related to these sources. This involves using specially developed tools like the RMI's standardised conflict mineral reporting template (CMRT), although instead of using the CMRT some companies use their own CSR assessment surveys or a combination of both. In either case, 34 case study companies contractually obligate relevant first-tier suppliers to complete RCOI surveys as well as to conduct due diligence among second-tier suppliers, who must also meet mineral sourcing standards set by leading brand companies. Consequently, RCOI surveys are a vital part of understanding mineral origins by engaging with direct suppliers and encouraging a trickle-down of due diligence reporting across tiers of the GVC. Case study companies also widely operate grievance mechanisms, which provide a more direct communication channel for individuals or organisations at all tiers of the GVC to safely report illegal or unethical practices. Additional sources of information on mineral risks, although not widely used, include secondary data (e.g. investigative reports or impact assessments) and external experts or CSOs.

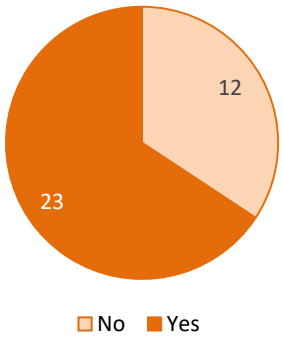


Figure 26: Number of case studies which report SORs compared to those that do not.

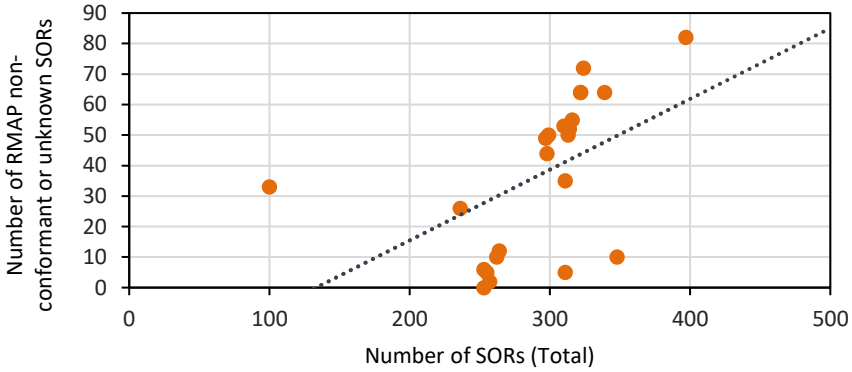


Figure 27: Number of RMAP non-conformant and unknown SORs reported by case study companies. (Data only includes companies which have reported SORs).

Collected RCOI data is assessed internally for risks by case study companies, for example, by a CSR, sustainability, procurement, or even a specialised mineral sourcing team. The purpose of this is to evaluate the completeness and accuracy of survey data, as well as to identify red flags for sustainability risks. Within this, 15 case study companies use internally designed parameters or generic CSR frameworks to assess risks (e.g. EcoVadis and DowJones). Yet, 17 case studies do so by comparing CMRT responses to SOR databases provided by the RMI, RJC or LBMA. Such databases are available to members of these associations and list 'conflict-free' SORs, validated via on-site audits conducted by third parties as part of initiatives like the RMI's RMAP process (discussed in Section 2.2.5). Within this verification process, SORs listed as non-conformant (i.e. fail to meet auditing standards) or not listed at all on these databases (i.e. awaiting audit) are considered red flags, particularly if located in high-risk areas. Thus, these SORs warrant further investigation via on-side audits (conducted by the company, third party organisation or industry body) and potentially the implementation of measures to manage identified risks. Yet, not all case studies report SORs publicly. Moreover, as shown in Figure 26, data shows that the more SORs that a company has, the more unknown and non-conformant SORs that it has. Suggesting increased challenges in managing mineral sourcing risks among companies with more SORs, perhaps due to barriers related to costs, time, resources, stakeholder interaction.

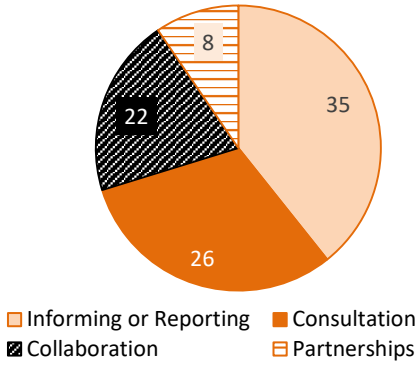


Figure 28: Modes of engagement used by case study companies in mineral risk identification and assessment

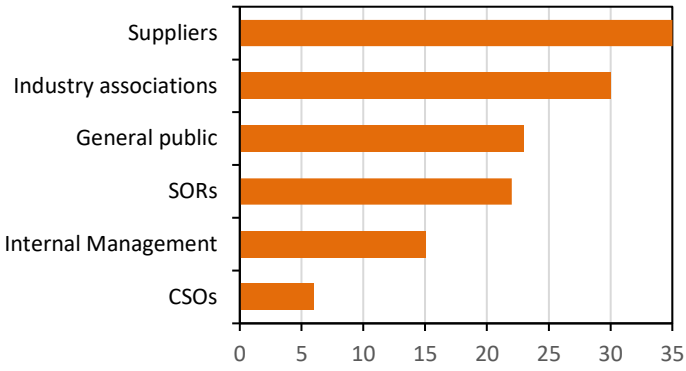


Figure 29: Actors engaged by case study companies as part of mineral risk identification and assessment

Finally, in Step 2, case study companies engage with various stakeholders to varying degrees of intensity as part of ongoing risk monitoring and improvement of due diligence practices (see Figure 28 and 29). For example, all case studies inform suppliers of identified risks and high-risk smelters, although several companies also inform senior management (15), industry associations (30) and the public (23). Moreover, 26 companies engage stakeholders in more intensive consultation, primarily providing advice or support to suppliers to improve due diligence practices based on survey and audit results. Yet, 22 case studies go one step further and provide more collaborative and tailored due diligence support to supply chain actors like suppliers and SORs. This can consist of providing training, tools, funding or resources to build capacity and aid participation in mineral transparency initiatives (e.g. CMRT and RMAP). This is often conducted in collaboration with industry bodies or CSOs. A small number of case studies (8) have also developed partnerships with suppliers and other supply chain actors to identify mineral risks, developing information-sharing platforms to facilitate ongoing exchange and learning between stakeholders. This extends to the joint operation of risk identification initiatives or grievance mechanisms with external stakeholders such as industry associations or CSOs.

Figure 30: Risk management strategies used by electronics case studies.

Step 3 of the Due Diligence Guidance focuses on engagement opportunities in the design and implementation of risk management. As shown in Figure 30, there is a greater variety of approaches used by electronics companies to manage risks compared to other steps in the due diligence process, indicating that risk management strategies are more complex and open to interpretation. For example, while all case studies inform or report mineral risks to key stakeholders like suppliers, 3 case studies simply require that their suppliers must avoid minerals from high-risk areas like the DRC altogether. This, of course, can have negative impacts on

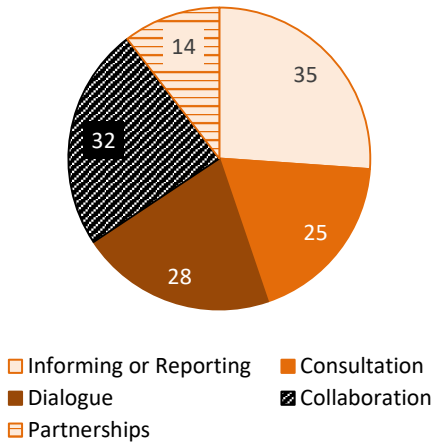


Figure 31: Modes of engagement used by case study companies in mineral risk management

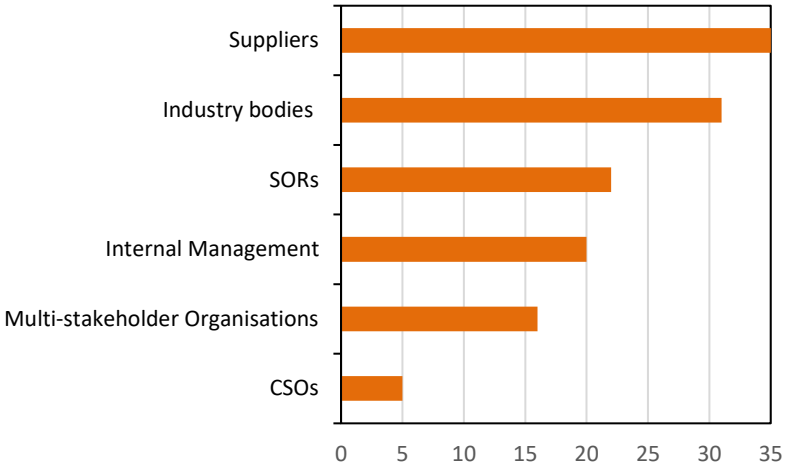


Figure 32: Actors engaged by case study companies in mineral risk management

legitimate mineral suppliers from high-risk regions and lead to damaging socio-economic impacts in these areas. In contrast, more proactive case study companies work with suppliers to remove only the SORs which continually fail to meet required standards (18), and/or prioritise those who perform well (17). Demonstrating that, mineral standards and practices differ in scope and rigour between case study companies. Meaning that case studies engage with stakeholders to varying degrees of intensity when managing mineral risks (see Figure 31 and 32).

Within this, the least intensive risk management strategies focus on reporting information on high-risk SORs with direct suppliers and internal management, which is used by 16 and 15 case studies respectively to develop corrective actions internally and among suppliers. Yet, to support the development of a pool of suppliers with rigorous mineral sourcing practices, 32 case studies further strengthen relationships with suppliers by providing training on responsible mineral sourcing and adopting collaborative risk management tools. In doing so, some case studies develop strong partnerships with suppliers to address sustainability risks. Furthermore, 22 case studies extend their collaboration with supply chain actors to SORs by directly reaching out to SORs and encouraging greater participation in mineral transparency initiatives like RMAP. This approach generally involves collaborating or partnering with industry initiatives/working groups focused on SOR engagement. On-top-of-this, case study companies adopt a range of internal measures to aid collaboration with both internal and external stakeholders. For example, establishing cross-functional mineral sourcing teams dedicated to stakeholder engagement activities (20), as well as developing databases for recording and disseminating due diligence information (15), and offering internal training or guidelines on engagement and responsible mineral sourcing (14). Risk management focuses heavily on engaging with industry and supply chain action actors, while other external stakeholders such as multi-stakeholder programs (16) and CSOs (5) are engaged to a lesser extent. Yet, working with multi-stakeholder groups or CSOs enables companies to work closely with stakeholders at various scales to develop knowledge and best practices. Thus, promoting responsible mineral sourcing across the mineral value chain, as well as contributing to in-region initiatives which address sustainability risks on-the-ground.

Next, Step 4 of the Due Diligence Guidance involves engaging with stakeholders to evaluate internal and external due diligence practices, ensuring that due diligence practices are verified and optimised at both the company-level (internal) and among strategic actors in the mineral value chain like SORs (external). As shown in Figure 33 and 34, case studies again engage with a range of stakeholders and to varying degrees of intensity. The most widely adopted practise among these companies is to report audit results to relevant actors like internal staff, suppliers and SORs, with the aim of delivering improvements to due diligence practices. However, the process of evaluating due diligence practices both internally and externally involves a greater degree of engagement with

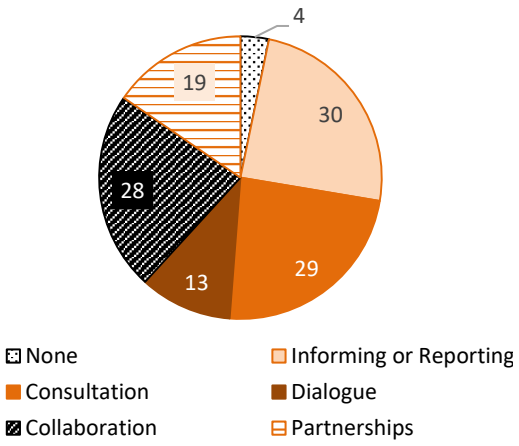


Figure 33: Modes of engagement used by case study companies in internal and external due diligence evaluation

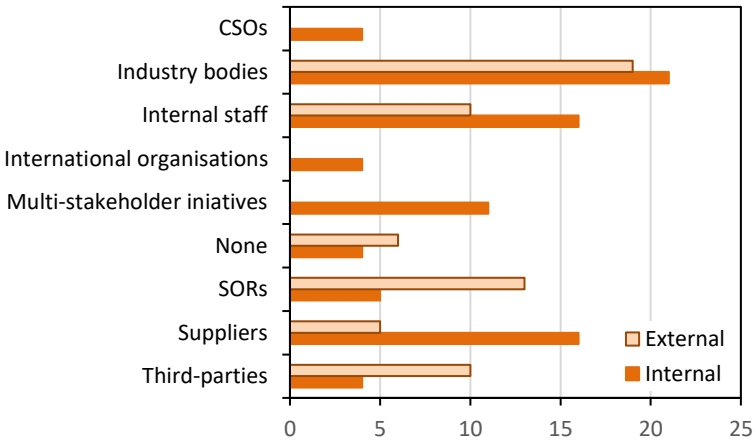


Figure 34: Actors engaged by case study companies in internal and external due diligence evaluation

stakeholders. Among the case studies, 10 choose to consult with independent third-party organisations who manage audits among SORs. Industry organisations also offer similar services to member organisations (e.g. using the RMAP database) and 19 companies take advantage of this sharing of information at the industry-level. Several case studies adopt more collaborative approaches by engaging directly with suppliers (5) and SORs (13) to audit due diligence practices on a more ongoing basis. To facilitate this, 10 case studies employ dedicated internal audit teams responsible for ongoing communication with these strategic actors as part of the monitoring process.

Industry associations are also the most widely engaged stakeholder as part of internal due diligence evaluation, with 21 case studies collaborating with industry bodies like the RBA to benchmark internal mineral sourcing practices. Many of these companies also participate in industry level partnerships to improve due diligence tools/procedures(e.g. RMI, iTSCi or LBMA working groups). An additional 21 case studies collaborate with suppliers and SORs to better understand how company-level due diligence process can be improved. While others include a broader range of stakeholders, such as CSOs (4) or even develop partnerships with multi-stakeholder initiatives (11) to evaluate internal due diligence practices. For example, international organisations like the OECD have established working groups in collaboration with 4 case study to research and promote best practices. Again, 16 case studies have dedicated internal team to facilitate this kind of engagement with external stakeholders. However, it is worth noting that a mixture of these approaches is used by most case studies, although 6 fail to conduct any sort of supply chain audits altogether and 4 fail to review internal due diligence procedures.

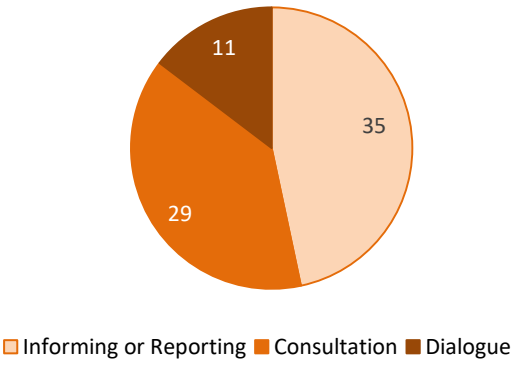


Figure 35: Modes of engagement used by case study companies in due diligence reporting

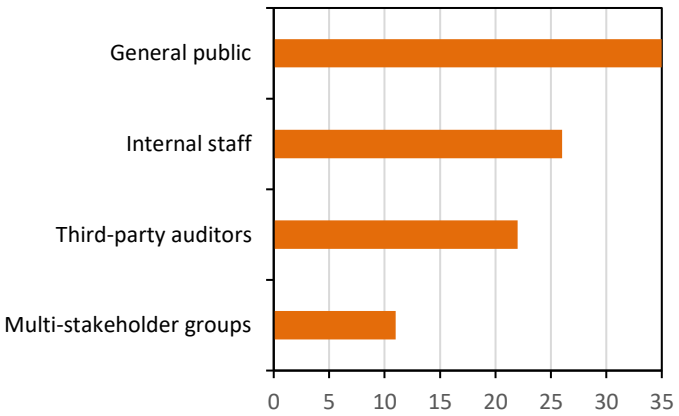


Figure 36: Actors engaged by case study companies in due diligence reporting

The final step of the Due Diligence Guidance, Step 5, involves incorporating stakeholders into due diligence reporting processes to ensure it is transparent, fair and accessible. Despite all case study companies reporting publicly, which can be considered a basic form of engagement, most do not describe in detail which stakeholders are engaged within this step of the guidance and to what intensity. However as shown in Figure 35, 33 case study companies have some sort of mechanism for stakeholder participation in reporting practices. For example, Figure 36 shows that all companies consult public surveys, feedback and grievance channels as part of an ongoing review of reporting practices and whether they are fit for purpose. Furthermore, some companies also consult internal and/or external auditors to conduct a more rigorous evaluation of reporting processes, particularly if using recognised sustainability reporting frameworks like those developed by GRI and AccountAbility. Yet, only 2 of the case studies tailor this specifically to assess stakeholder engagement practices within due diligence. Moreover, only 11 case studies take this further and use multi-stakeholder panels or advisory groups to create dialogues with key stakeholders (e.g. consumers, experts, CSOs, government officials, staff, investors etc.). Providing the most intensive and inclusive form of engagement within Step 5 of the Due Diligence Guidance.

5.3 Stakeholder Engagement Effectiveness

While section 5.2 analyses corporate approaches to planning and implementing stakeholder engagement as part of wider due diligence practices, the following analysis focuses in detail on the characteristics of stakeholder engagement itself. Again, the policy outputs identified in Table 5 are used (specifically outputs 3 to 12) alongside the related assessment criteria to compare and evaluate corporate practices for meaningful engagement.

Policy Output 3: Set clear engagement policy

The first step of meaningful engagement is to establish a management commitment, either via a dedicated policy or by incorporating existing guidelines or codes of conduct into policies. In addressing assessment criteria 3.1, analysis highlights that all but two case studies have adopted some sort of policy commitment to stakeholder engagement. Furthermore, as identified when assessment criteria 1.1 and 1.2 in Section 5.2, all case study companies offer publicly accessible information on internal policies via corporate reports/CSR documents. Additionally, case study companies engage with a range of stakeholders in policy development, engaging them to various degrees of intensity. Given that engagement policy is generally incorporated into wider policy development processes, data collected for policy output 1 can be applied to assessment criteria 3.2 and 3.3.

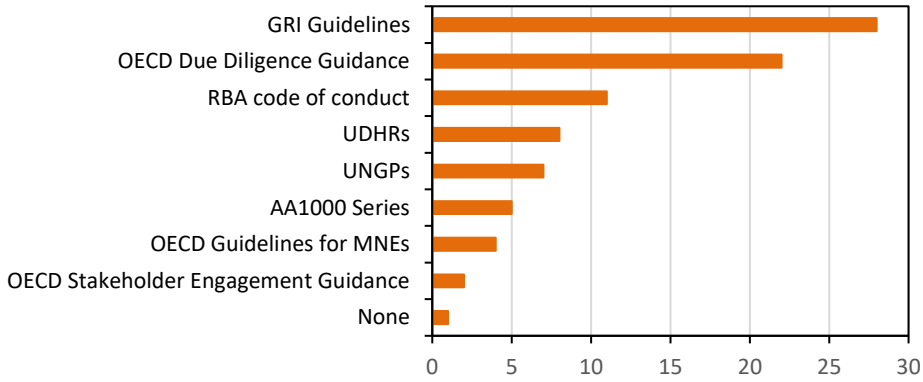


Figure 37: Number of international sustainability frameworks incorporated into mineral sourcing policy among case studies.

Case study companies also incorporate a range of internationally recognized standards and guides into engagement policies (as shown in Figure 37), providing an insight into assessment criteria 3.4. For example, 28 case studies use the GRI sustainability reporting framework, which integrates stakeholder engagement into the general materiality of CSR and can be used by companies to evaluate engagement practices. In addition, sustainability frameworks established by well-recognized organisations like the OECD, RBA and UN are also incorporated into engagement policy among many companies. Yet, the purpose of frameworks like the UNGPs,

Due Diligence Guidance and RBA code of conduct is to provide more universal guidance on sustainability, rather than specific provisions on stakeholder engagement. In contrast, some case studies apply frameworks focused specifically on integrating stakeholder engagement into business practices, including AA1000 Series and OECD Stakeholder Engagement Guidance. Although, the limited use of these frameworks suggests that more case study companies tend to view stakeholder engagement as part of broader sustainability responsibilities, rather than for managing specific issues related to mineral due diligence.

Policy Output 4: Establish management responsibilities for engagement

Establishing dedicated internal management and systems for stakeholder engagement is essential for meaningful engagement outcomes. The analysis shows that all case studies explicitly allocate engagement responsibilities to a specific department, most often this is assigned to the departments which oversee CSR, sustainability or supply chain management as these tend to be most operationally involved in stakeholder engagement (assessment criteria 4.1). Yet, the overall accountability for stakeholder engagement is generally appointed to senior management within all case studies. This tends to be in the form of a cross-functional committee who strategically manage departments/business units on key issues such as sustainability (assessment criteria 4.2). Assigning the management of stakeholder engagement activities in a cross-functional way clearly defines and embeds engagement roles, as well as lines of communication, both internally and externally. In doing so, concentrating resources and expertise within a dedicated group, while also making it easier and more efficient to build relationships with stakeholders as well as incorporate engagement outcomes into business making decisions. This is demonstrated in Section 5.2, as many case studies can improve risk identification and management by establishing dedicated and cross-functional due diligence teams responsible for engagement.

Policy Output 5: Appropriately identify and analyse stakeholder groups

Case study companies adopt a range of methods for identifying and assessing stakeholders as shown in Figure 38 and 39. This is vital for understanding the actual or potential impact of business activities across the GVC, as well as how to fairly and meaningfully remedy identified risks. The data shows that a wide range of data collection methods are used by case studies when identifying stakeholders, as shown in Figure 38. The tool most widely adopted by all case studies involves using relatively simple channels for formal communication and gathering stakeholder information or feedback. This includes the use of a publicly available phone hotline, email address, online forums and/or support/complaint channels. This is no surprise given the relatively low resource and time costs involved in managing these communication channels, as well as the fact that companies need to operate these kinds of channels to communicate with stakeholders for a wide range of reasons not related to responsible mineral sourcing. However, 23 companies also operate grievance mechanisms, either directly or via third party organisations like CSOs or industry bodies. In many ways grievance mechanisms are similar to other formal communication channels but are listed separately as these allow companies to gather data directly from supply chain stakeholders affected by a range of sustainability risks (e.g. whistle-blowers), making this more effective for identifying stakeholders in relation to responsible mineral sourcing.

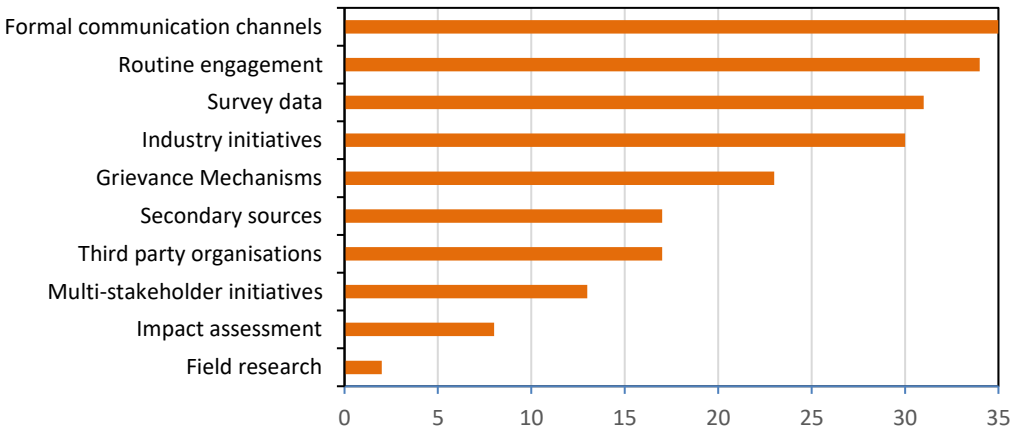


Figure 38: Methods used by case study companies to gather stakeholder data

Additionally, incorporating the gathering of stakeholder information into routine stakeholder engagements is also a widely used approach, with 34 case studies using regular activities like stakeholder conferences, training and face-to-face meetings to engage with and gather information on key stakeholders (e.g. customers, shareholders, media, union representatives and suppliers). Case study companies also use various external organisations to gather data on a range of stakeholders. This includes 30 case studies who gather this information from their participation in industry organisations (e.g. RBA), 13 who use participation in multi-stakeholder organisations (e.g. EPRM, PPA), and 17 who use other third-party organisations (this could include CSOs). These organisations conduct stakeholder research and provide information to participating organisations or operate platforms for multiple organisations to share information regarding relevant stakeholders (e.g. forums, panels, advisory groups, policy councils). The RBA is a good example and initiatives like the RMI engage with upstream actors in the GVC then publish lists of these stakeholders to member organisations, it also operates various working groups for participants to collaborate on specific issues.

Despite this, some case study companies conduct their own stakeholder research and, again, different approaches are used by case study companies. For example, 17 case study companies use secondary sources to gather data, generally focusing on socio-economic trends, international sustainability frameworks and relevant media/historical/cultural/political documents. Case studies also use various forms of primary research with 31 case studies using surveys (e.g. supply chain risk assessments), 8 conducting specific stakeholder impact assessments, and 2 carrying out in-situ field research to directly investigate impacts on-the-ground. In evaluating assessment criteria 5.1 it is clear that the approaches used by case studies to research stakeholders vary in terms of the scope and level of detail. Yet, it can be deduced from the literature (see Section 3.1) that effective and thorough stakeholder identification requires more intensive forms of investigation, ideally, using primary sources and incorporating actors who can raise awareness of certain issues or affected stakeholders. This can include independent actors with specific expertise in supply chains (e.g. industry bodies, CSOs, multi-stakeholder groups) or actors with direct experience of sustainability risks (e.g. CSOs, affected community groups or workers).

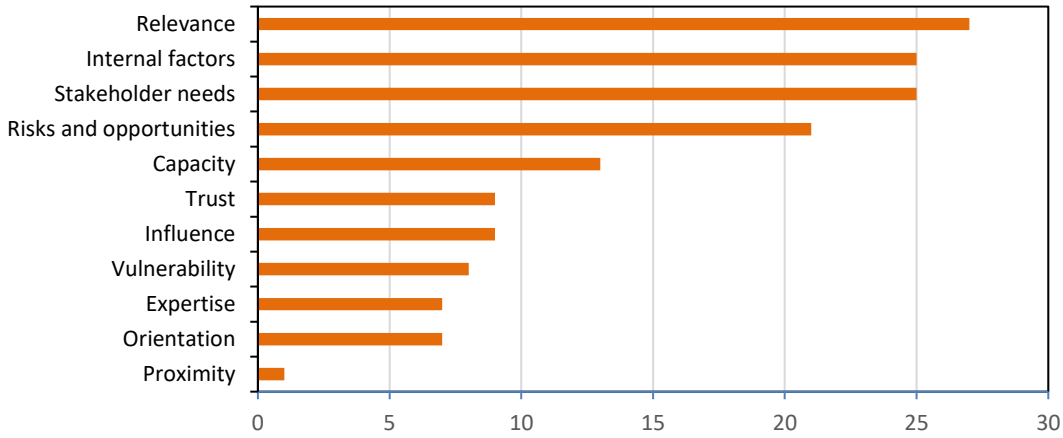


Figure 39: Criteria used by case study companies to assess and prioritise stakeholder groups

Once stakeholders are identified, case study companies also utilise a variety of factors with which to assess and prioritise certain stakeholder groups, as shown in Figure 39. Within this, the most ambiguous and least transparent approaches are also the most widely used. For example, 27 case study companies assess stakeholders based on their relevance to the topic or project concerned, along with the scope and purpose of engagement. Given resource and time constraints not all stakeholders can be engaged, particularly not using higher intensity engagement modes. Therefore, stakeholders are prioritised and engaged based on the information gained from stakeholder identification and the relevance of certain stakeholder groups. Using these considerations, 25 case studies employ additional internal factors to determine which stakeholders to prioritise. This can include incorporating company policies, values, strategy, research, capabilities etc. into decision making, with the responsibility for this decision making often delegated to a specific department or committee for stakeholder

engagement. Furthermore, 25 case studies also align stakeholder prioritisation with stakeholder needs and expectations, which can be explicitly or implicitly extracted from previous engagement or the initial stakeholder identification process. Understanding stakeholder needs is vital as these vary between different groups and form an important part of engagement planning. Likewise, engagement planning and outcomes can be improved by incorporating potential business risks (e.g. engagement with a particular stakeholder may attract bad publicity) and opportunities (e.g. stakeholder has linkages to other unidentified stakeholders) related to engaging with certain stakeholders, enabling companies to optimise engagements.

A small number of case studies also incorporate recognised engagement frameworks such as AA1000 and the GRI reporting guidelines into an engagement strategy, which outline various criteria to assess and prioritise stakeholders. Within this, 13 case studies incorporate stakeholder capacity to engage (i.e. the level of stakeholder resources and representation); 9 incorporate the level of mutual trust between the stakeholder and business (i.e. existing relationships); 9 incorporate stakeholder influence (i.e. ability to influence a project or actor); 8 incorporate stakeholder vulnerability (i.e. susceptibility to sustainability risks); 7 include stakeholder expertise (i.e. assess to useful knowledge); 7 use stakeholder orientation (i.e. willingness to engage); and 1 uses stakeholder proximity (i.e. the extent of existing relationships). These criteria are especially important for ensuring that stakeholders are fairly (and equally) represented within stakeholder engagement, as they define recognised, practical and measurable principles with which to approach stakeholder engagement in a sustainability governance context. Therefore, in evaluating assessment criteria 5.2 it can be understood that all of the criteria described have a positive role in stakeholder engagement strategy, although companies which base their strategy on the principles outlined by the GRI and AA1000 have the most robust approach. This is a vital part of ensuring the full participation of stakeholders within engagement and building long-lasting relationships.

Policy Output 6: Set appropriate engagement objectives

Stakeholder engagement planning involves developing appropriate objectives to outline the individual roles, responsibilities and intentions within the engagement. If planned effectively, these objectives will meet the needs and expectations of both the company and the stakeholders involved. As shown in Figure 40, the case studies incorporate various factors into their engagement objectives. Within this, corporate-level objectives and strategy are the most widely used factor, with 26 case studies using this approach. In comparison, 22 case studies incorporate stakeholder needs and expectations into planning objectives, reflecting a slight inclination for companies to value internal factors over external. However, a smaller number of case studies also utilise more comprehensive tools to ensure fair and equal stakeholder representation as part of planning engagement objectives. This includes 7 case studies who incorporate the level of stakeholder support required to participate in engagement (e.g. use of translators), 4 case studies include feedback and outcomes from previous engagement into planning objectives, while 4 case studies explicitly follow stakeholder engagement frameworks such as the AA1000 or GRI. Additionally, 3 case studies also incorporate other frameworks which relate to the engagement purpose (e.g. Due Diligence Guidance).

Figure 40: Factors incorporated into planning stakeholder engagement objectives among case study companies

In evaluating assessment criteria 6.1, the majority of companies align engagement objectives with corporate strategy. This is key to ensuring that engagement activities are planned in line with clear goals, expectations and outcomes. A number of companies also seek to be more inclusive of stakeholder values, needs and expectations as part of engagement planning. This can be done by using engagement frameworks which outline principles for effective engagement objectives, as well as using knowledge from previous engagements or from conducting context-specific research on stakeholders and the circumstances in which engagement is taking place. This helps the organisers of engagement better plan for effective engagement, for example, by incorporating provisions (e.g. allocating resources) to support stakeholders and make engagement accessible.

Policy Output 7: Ensure stakeholders are informed

An additional aspect of engagement planning involves appropriate and timely communication with relevant stakeholders before engagement activities. This is important to outline the scope of planned activities and provide stakeholders with sufficient information, as well as allowing enough preparation time so that all parties can fully comprehend and share their perspectives. As shown in Figure 41, case study companies predominately use this initial engagement with stakeholders to inform them of upcoming engagement activities, with 28 case studies adopting this approach. This may involve sharing the engagement time, location, agenda, attendees, engagement objectives etc., which is most often communicated via email or telephone. Other factors incorporated into this initial engagement include 8 case studies who provide support to stakeholders before engagement. For example, financial support to reimburse the travel and time costs related to attending engagement. Additionally, 7 case studies provide more detailed and relevant information to stakeholder prior to engagement. For example, relevant policy documents like the Due Diligence Guidance. Therefore, in evaluating assessment criteria 7.1 it is clear that some sort of initial engagement is an important step in laying the foundation for effective engagement activities. However, ensuring that this information is reliable, accessible and shared well in advance of engagement activities is vital. This allows stakeholders to fully understand and utilise the information provided, making it easier for them to participate fully in the engagement itself.

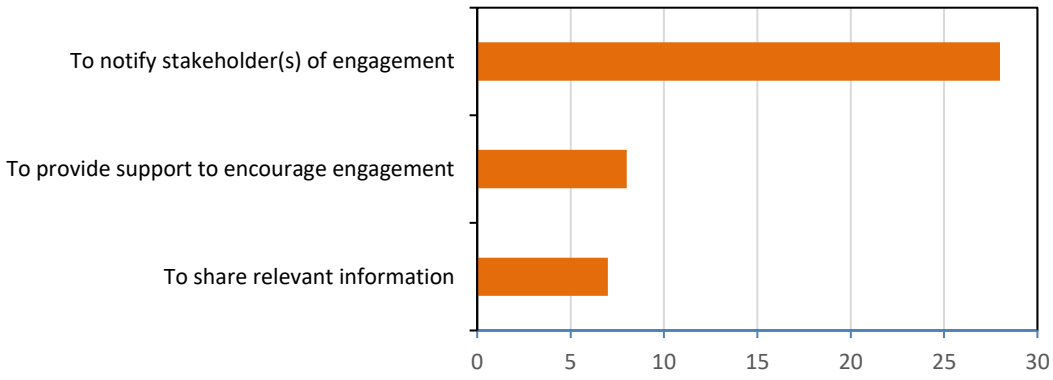


Figure 41: Reasons listed by case study companies that stakeholders are contacted prior to engagement

Evaluating assessment criteria 7.2 is challenging as each engagement is highly contextual and the appropriate level of initial engagement during the planning phase will vary. However, the extent to which corporate policies are accessible and incorporate stakeholder engagement frameworks can be used as a general measure of how companies approach information sharing in this context (see assessment criteria 2.2 and 2.4). Within this, companies which adopt specific engagement frameworks (e.g. AA1000 Series and OECD Stakeholder Engagement Guidance) will likely inform stakeholders using the most appropriate methods. This is because such frameworks outline the critical role of being culturally sensitive when planning the engagement context, location, format, language etc. Furthermore, the degree of knowledge and expertise companies have regarding their stakeholders and engagement practices can also influence the quality of this initial planning and engagement phase. Primarily because this reflects the level of information collected on stakeholder groups and the understanding of stakeholder needs/expectations.

Policy Output 8: Assign appropriate 'mode' of engagement

As part of effectively implementing meaningful stakeholder engagement, it is vital that companies strategically apply an appropriate mode of engagement. As outlined in Section 3.1, this determines the intensity of the engagement activities, the nature and timescale of the relationship, as well as the level of communication between the stakeholders involved. These variables should be tailored to the engagement scope, objectives and stakeholder needs, as part of identifying optimum mode with which to engage. Therefore, it is vital to ensure that engagement objectives are appropriate, given that this is a major determinant for the most suited mode of engagement. Moreover, each engagement is highly contextual and different modes of engagement may be most pertinent with each separate engagement. Therefore, it is important that companies thoroughly research the engagement setting and evaluate which mode to apply before initiating any engagement with stakeholders.

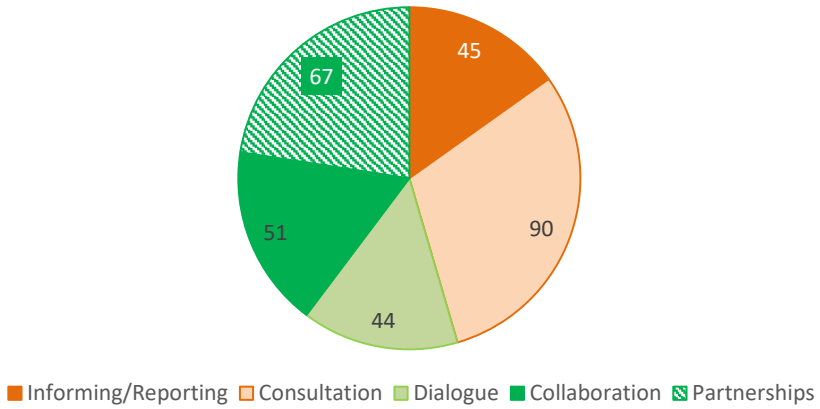


Figure 42: Frequency of engagement modes used by case study companies to engage stakeholder groups.

To analyse how case studies use engagements modes, Figure 42 shows the most frequently used engagement modes by case studies. Highlighting that low-intensity modes including informing/reporting and consultation make up 45% of case studies' most commonly applied engagement modes. Medium-intensity engagement modes such as dialogue and collaboration total 32%, while high-intensity modes like partnerships total 23%. The dominance of low-intensity modes, particularly consultation, most likely reflects the increased resource costs involved in higher intensity modes relative to low-intensity modes (e.g. capital, time, experience). This makes low-intensity modes of engagement easier to implement and more practical in a wider range of engagement settings. Furthermore, consultation is the most basic form of two-way communication available, in which stakeholders can provide a degree of feedback/response within a fairly limited setting (e.g. survey, one-off meeting). This may explain why consultation is more widely used than informing/reporting, which offers much less in terms of outcomes. Other more intensive forms of engagement such as collaboration and partnerships may also be more appealing than lower intensity modes of two-way communication like dialogue (the least frequently used mode). For example, if a company is already willing to commit resources to ongoing engagement then increasing the costs slightly may be seen as beneficial due to the extra level of engagement intensity that collaboration and partnership bring.

Following on from this analysis, Figure 43 shows that case study companies engage with certain stakeholder groups to a higher degree of intensity than others. For example, industry associations and multi-stakeholder initiatives are largely engaged via high-intensity modes, while customers, investors and workers are predominantly engaged through low-intensity modes. This can be used to indicate that case study companies are more willing to invest and prioritise scarce resources into engagement with certain stakeholder groups, providing some insight into the level of value or importance ascribed to different stakeholder groups. Yet, almost all stakeholder groups are engaged using multiple modes by different case studies, highlighting that different case studies place varying significance on different stakeholder groups. For example, CSOs are engaged using the widest

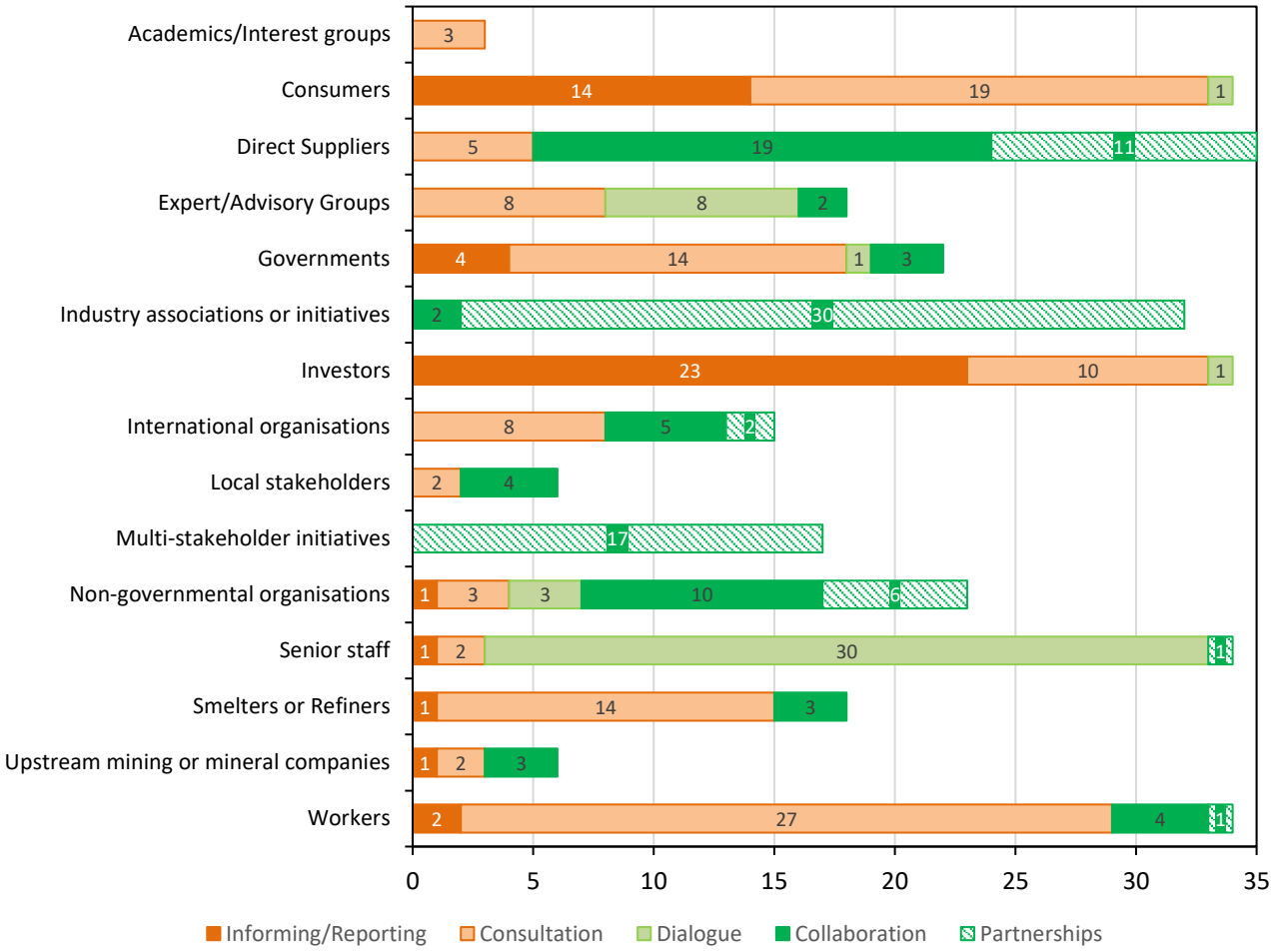


Figure 43: Most frequently applied engagement modes used by case study companies when engaging specific stakeholder groups

range of engagement modes by different case studies, this includes low intensity informing/reporting to high-intensity partnerships. Yet, in some cases, a particular engagement mode may be a condition of engaging with that particular group. For example, industry associations and multi-stakeholder initiatives will inherently require high-intensity modes due to take fact that multiple actors are coming together to address a particular issue over a prolonged period, requiring ongoing engagement and cooperation. Additionally, due to the proportionally higher costs engaging larger stakeholder groups, companies will generally use low-intensity modes to engage groups like customers, workers and investors. Despite this, stakeholder groups such as customers, workers and investors are among the most important corporate stakeholders due to their ability to directly influence profitability. Suggesting that looking at engagement intensity alone is not an accurate measure of stakeholder value or importance.

However, looking at Figure 43 it is also clear that certain stakeholder groups are engaged by more case studies than other groups. For example, direct suppliers are engaged by all 35 case studies while academic/interest groups are only engaged by 3. This can also be used as an indicator of the relative importance of stakeholder groups because companies will generally engage with stakeholders they value. Therefore, the number and intensity of engagements can both be a measure of the relative importance of that stakeholder groups to the case study companies. As shown in Table 6, combining these indicators can be used to produce an engagement score for each stakeholder group. Analysing this data reveals that industry organisations, direct suppliers, senior staff and workers can be considered among the most valued and prioritised stakeholder groups, while academics/interest groups, local stakeholders and upstream mining/mineral companies are among the least important.

Stakeholder Group	Engagement Score[23]
Industry associations or initiatives	95
Direct Suppliers	88
Senior staff	67
Workers	56
Non-governmental organisations	55
Multi-stakeholder initiatives	51
Consumers	45
Investors	40
Governments	35
Expert/Advisory Groups	33
International organisations	31
Smelters or Refiners	30
Local stakeholders	13
Upstream mining or mineral companies	12
Academics/Interest groups	5

Table 6: Table showing the engagement score calculated for each stakeholder group engaged by case study companies

In addressing assessment criteria 8.1 it is clear that case study companies focus their resources and priorities on engaging more often and to a higher level of intensity with certain stakeholder groups, which tends to be industry-level and internal corporate stakeholders. This allows case studies to develop strong relationships with these stakeholders, which is vital for the functioning of the business but also highlights the areas where companies can influence stakeholders regarding responsible mineral sourcing practices. From this analysis, it is also possible to deduce the stakeholder groups who can most influence decision making within the case study companies. Additionally, Policy Output 5 and 6 can also be used to provide insight into the level of engagement planning and stakeholder research/analysis among case studies, factors which certainly influence the degree to which appropriate engagement modes are selected.

Policy Output 9: Support stakeholders to ensure fair, equal and respectful representation

Meaningful stakeholder engagement involves building reciprocal relationships with stakeholders and ensuring that all relevant stakeholders have the opportunity to be represented. Therefore, engagement should be planned and implemented in a way that is open (accessible and unrestricted), inclusive (all stakeholder groups are equally represented) and respectful (sensitive to stakeholder culture, values and needs). The data in Figure 44 shows that 33 case studies operate a grievance mechanism, this is a relatively simple form of one-way reporting which should provide a free, confidential and accessible channel of communication for internal and/or external stakeholders to raise concerns (e.g. face-to-face reporting, online channels, phone hotline and/or letter). While a high proportion of case studies have a grievance mechanism in place, this is a minimum requirement in terms of encouraging fair, open and equitable engagement. Furthermore, to be effective, grievance mechanisms also require company-level mechanisms to ensure appropriate handling and remedy of issues raised by stakeholders. As shown in Figure 44, case study companies use a range of other internal processes related to stakeholder engagement. Within this, 27 case studies have adopted internal staff training to support stakeholder engagement, which provides information sharing and upskilling for people in engagement related roles but also represents quite a basic approach which lacks effectiveness for several reasons. For example, training may not be mandatory or available to all staff in an engagement role, furthermore, it may not be detailed enough to convey the complexities of stakeholder engagement and relevant engagement frameworks. The data also shows that 20 case studies have dedicated teams responsible for stakeholder engagement. This can make engagement processes more effective and efficient by concentrating expertise and resources in one area of the company, enabling highly skilled staff to

[23] Engagement score is calculated by multiplying the number of times each stakeholder is engaged using a particular engagement mode, by the following values for each engagement mode to reflect the increased significance of higher intensity modes: Informing/reporting, 1; consultation, 1.5; dialogue, 2; collaboration, 2.5; and partnerships, 3.

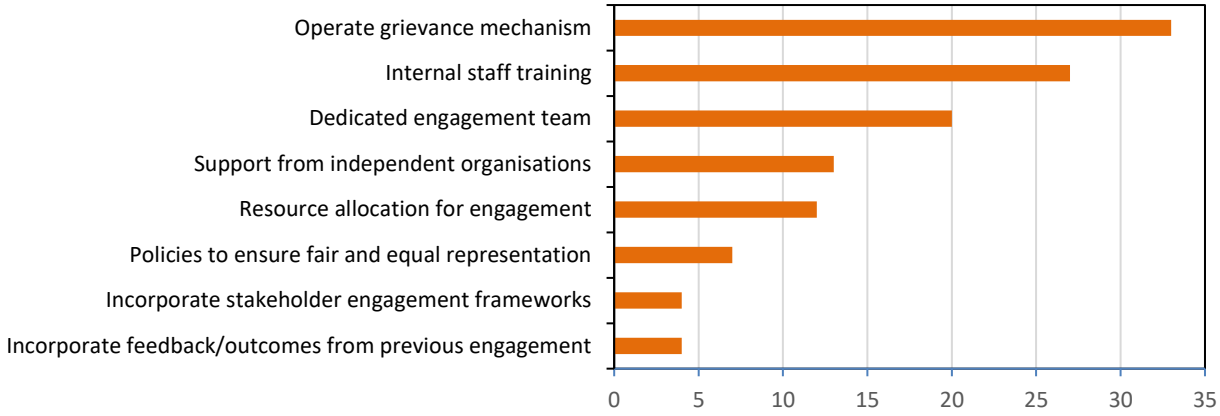


Figure 44: Internal processes among case study companies to facilitate stakeholder engagement

focus specifically on planning, implementing and monitoring engagement processes with a range of stakeholders. Thus, leading to the accumulation of knowledge regarding individual stakeholder groups and resources to address a wide range of stakeholder needs, resulting in stronger long-term relationships with stakeholders.

Furthermore, 12 case studies specifically allocate resources to support participation among stakeholders, which can include reimbursing stakeholder costs related to engagement or funding interpreters. This can help stakeholder groups overcome potential barriers to engagement (e.g. costs, linguistic, cultural, lacking official means of representation), resulting in improved participation and representation within the engagement. Next, 7 case studies have specific policies in place to guide internal stakeholder engagement processes, ensuring fair and equal representation. Within these policies, 4 case studies incorporate engagement frameworks such as AA1000, which contain provisions for ensuring fair and equal stakeholder representation within engagement planning. Another 4 case studies incorporate outcomes and feedback from a previous engagement, feeding into continuous improvement of engagement while also demonstrating respect and appreciation for ongoing interaction. Finally, 2 case studies involve third-party external organisations into engagement planning (e.g. CSOs, industry bodies), which can increase engagement effectiveness in many ways. For example, these organisations can utilise their expertise and existing relations with certain stakeholder groups to improve corporate engagement (in terms of its openness, inclusivity and sensitivity), or even directly facilitate engagement to reduce resource pressures on companies while also leading to increased knowledge and legitimacy within the engagement.

Policy Output 10: Assign realistic and appropriate engagement timelines

Data collection for the purposes of analysing engagement timelines was challenging as each stakeholder engagement is highly specific and timelines will vary considerably, for example, individual stakeholder meetings may last a few hours or extend to ongoing engagements over many years. Despite this, insight can be gained from data collected when assessing other policy outputs. For example, policy output 7 highlights that 28 case studies approach stakeholders before engagement to inform them of upcoming engagement activities, this initial communication allows stakeholders to prepare for engagement and alter engagement timelines if it is not realistic or appropriate (based on stakeholder needs). Moreover, appointing a certain mode of engagement (based on the engagement objectives) incorporates several decisions and/or assumptions regarding the length of the engagement with that stakeholder. For example, informing/reporting implies one-off and quick engagement, while medium and high-intensity modes have an increased likelihood of ongoing/follow-up engagements. As outlined, stakeholder research is a fundamental part of understanding which mode of engagement to apply. Additionally, corporate research into stakeholder needs and the engagement context is also an important step in defining appropriate engagement timelines. Within this, in-depth research using approaches like impact assessments or field research allows case study companies to incorporate stakeholder needs and dynamic on-the-ground conditions (e.g. politics, conflict, cultural events) into engagement planning. This is particularly true for stakeholder groups which are vulnerable or lack representation and may find it difficult to be involved in engagement planning, requiring a more supportive and flexible approach to engagement.

Policy Output 11: Establish appropriate engagement outcomes

In analysing the data, Figure 45 shows that 34 case study companies actively maintain communication with stakeholders after engagement and this communication is conducted for a wide range of reasons, as highlighted in Figure 35. The most common reason to continue communication is so that case study companies can inform/report on the engagement outcomes and update stakeholders on current progress towards agreed objectives. The data shows that 31 case studies report engagement outcomes and related activities back to stakeholders. Yet, the frequency and level of detail within this reporting will vary between companies. As part of evaluating assessment criteria 11.1, case studies should seek to keep stakeholders regularly informed of all relevant developments throughout the remediation process and on a frequent basis, ensuring that stakeholders are fully informed and preventing unexpected impacts on stakeholders. This is particularly important for building trust with the stakeholders regarding the implementation of remedial actions.

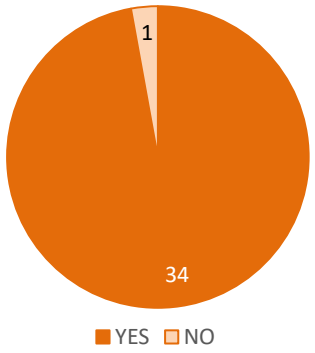


Figure 45: Do case study companies have systems in place to maintain communication after stakeholder engagement.

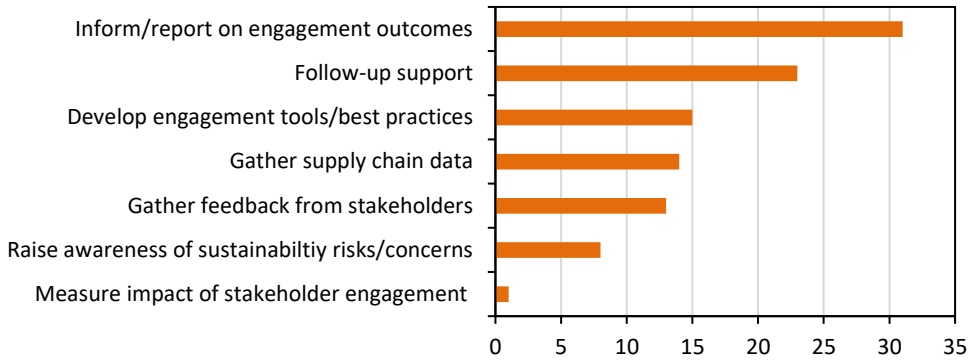


Figure 46: Reasons why case studies maintain communication with stakeholders following engagement

Figure 46 also shows that some case studies go further than simply informing/reporting to stakeholders as part of remediation. For example, 23 case studies provide follow-up support to stakeholders, which generally includes the provision of training, equipment and/or other resources to establish two-way communication channels as part of the remediation activities or communication process. In doing so, ensuring that remediation incorporates stakeholder input and that stakeholder concerns are adequately addressed. This also relates to the gathering of supply data and raising awareness of sustainability risks/concerns. For example, 14 case studies maintain open communication channels with stakeholders on-the-ground to support the gathering of supply chain data at critical points in the GVC (e.g. communities in mining areas, CSOs, SORs etc). This can help companies to identify and mitigate potential upstream risks using a strategic network of actors, reducing costs involved and increasing capacity. Additionally, 8 case studies also actively share information on potential sustainability risks/concerns as part of ongoing engagement with stakeholders in these areas. Thus, creating a powerful multi-actor approach for collectively identifying sustainability risks across mineral supply chains.

In addressing assessment criteria 11.2, this ongoing and two-way communication with stakeholders enables case studies to incorporate stakeholder needs into remediation, allowing for more effective management of sustainability risks across the mineral value chain. Yet, this approach also encourages ongoing information sharing as part of a more long-term approach to identifying and mitigating future risks. Among the case studies, 15 companies also use ongoing engagement to inform and/or develop internal processes and tools for engagement, using this as a mechanism for continual improvement. This can support companies in optimising ongoing engagement to best suit the capacity, needs or expectations of all actors involved. Interestingly, 13 case studies actively gather engagement feedback from stakeholders as part of this, while 1 case study actively measures the impact of engagement on stakeholders involved (e.g. by conducting a follow-up impact assessment and comparing this to pre-engagement assessment). This research into the internal/external review and improvement of engagement practices is continued in more detail for policy output 12.

Policy Output 12: Develop appropriate monitoring and evaluation mechanisms

The final aspect of meaningful engagement requires that companies develop a means for monitoring and evaluating engagements with stakeholders. As shown in Figure 47, 34 case studies have some sort of system for monitoring/evaluating engagement practices at the corporate-level. This highlights that the majority of case studies meet the criteria outlined in assessment criteria 12.1. However, a range of different methods are used by case studies to gather information or feedback on engagement practices, as shown in Figure 48. Some companies approach this with greater transparency and credibility than others, which can be vital for ensuring the stakeholders trust the process and will approach future engagements positively. Furthermore, monitoring/evaluation of engagement can be enhanced by incorporating certain stakeholder groups, who can help reinforce high standards of engagement by providing expertise, independent assurance, understanding/adherence to engagement frameworks etc.

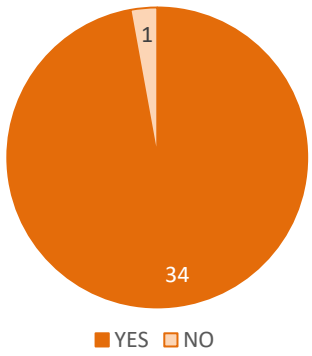


Figure 47: Do case study companies have internal systems to monitor/evaluate stakeholder engagement

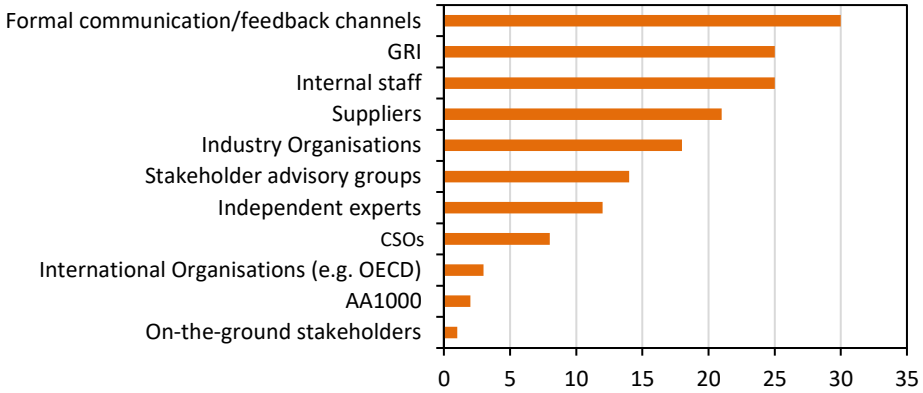


Figure 48: Methods used by case study companies in the ongoing monitoring/evaluation of stakeholder engagement practices.

In evaluating assessment criteria 12.2, Figure 48 is used to analyse the methods and stakeholder groups involved in engagement monitoring/evaluation processes among the case studies. From this, it is clear that the majority of case studies (30) use formal communication for gathering stakeholder engagement feedback. This could involve a stakeholder using basic communication channels to approach companies (e.g. hotline, email, grievance mechanisms) and raise issues regarding an engagement (e.g. if the stakeholder perceives that there is lack of remedial actions by the company). As discussed in analysing policy output 5, these are relatively low-cost ways of gathering information from stakeholders and most large companies already have these systems in place. It is also worth noting that this is generally more of a responsive approach and is less focused on ongoing engagement monitoring/evaluation or building long-term relationships with stakeholders.

Alternatively, 25 case studies focus on internal staff when overseeing engagement monitoring/evaluation. This includes conducting internal performance assessments, reviewing processes, as well as providing staff training and developing specialised working groups to enhance engagement practices or strengthen stakeholder relationships. Relating to this, case studies also align engagement practices to recognised frameworks such as the GRI (25) and AA1000 (2) as part of internally reviewing or validating engagement processes, which can be used to increase the credibility of engagement practices. Additionally, industry stakeholders are often incorporated into engagement monitoring/evaluation, including suppliers (21) and industry organisations (18). These are close strategic stakeholders and among the most widely engaged by case study companies, therefore it is logical to incorporate them into maintaining high-quality engagement. Industry organisations can also provide expert insight, tools and resources to support engagement, as well as collaboration in working groups specifically focused on engagement (e.g. RMI smelter outreach/engagement working group). International organisations or governments can play a similar role in providing support or frameworks to guide corporate engagement with 3 case studies actively involving groups like the OECD in improving engagement.

Despite this, some stakeholder groups may inherently distrust top-down government, corporate and industry approaches to engagement. For example, communities in mining areas who are negatively impacted by corporate activities and conflict may distrust large external organisations that they have no relationship with. Therefore, incorporating independent external stakeholders with a presence on-the-ground can be useful for monitoring or improving engagement practices, while also increasing the integrity and legitimacy of engagement. Within this, independent experts (12) and CSOs (8) can provide expert insight, impartial advice or assurance, as well as direct participation in or facilitation of engagement (e.g. with vulnerable or poorly represented stakeholders). Furthermore, on-the-ground stakeholders can also offer unique perspectives into how engagement can be better approached (e.g. cultural, religious, or political values, norms and rules). Although, this group are only incorporated by 1 case study into engagement review, perhaps due to the high costs and other barriers relating to engagement with on-the-ground stakeholders (particularly on a frequent and long-term basis).

Finally, the most rounded approach to monitoring/evaluating engagement practices incorporates multiple stakeholders as part of a dedicated advisory group or panel. Depending on the stakeholders involved in monitoring/evaluation and organisation of the group, these advisory groups can potentially integrate the advantages offered by all stakeholders discussed. This can be particularly useful for highlighting a wide range of issues related to engagement, as well as facilitating discussion and revealing diverse perspectives on the topic. Therefore, in summarising assessment criteria 12.2, all methods described have a positive role in the monitoring or review of engagement practices. Although, this depends on the organisation of monitoring/review processes, as well as the extent to which stakeholders involved feel valued and able to freely participate/provide feedback.

6. Sustainability Governance Effectiveness

Based on the analysis of case study mineral due diligence and stakeholder engagement practices using policy outputs 1 to 12, this section goes one step further to critically examine how effectively these policy outputs are implemented by case study companies and the extent to which this contributes to positive sustainability outcomes in the mineral value chain (as summarized in Table 7). To achieve this, wider literature is analysed to build on the data analysis in Section 5, supporting the assessment of major internal and external influences on the corporate governance of sustainable mineral sourcing. In doing so, this more in-depth analysis focuses on evaluating how policies for mineral sourcing and stakeholder engagement are implemented at the corporate-level, as well as how the outputs from these policies such as regulations, tools, plans (independent variables) impact responsible mineral sourcing (dependent variable). This feeds into an assessment of the overall sustainability impact of these measures within the mineral value chain, which derives from the conceptual and theoretical frameworks in Section 2 and Section 3.

6.1 Mineral Due Diligence Effectiveness

Firstly, the literature outlines that defining clear corporate commitment to sustainability is fundamental for the allocation of internal responsibilities, resources and procedures for supply chain sustainability (Wittstruck and Teuteberg, 2012; Dobele *et al*., 2014). Here, case study data shows that all electronics MNCs in this study have publicly accessible policies for supply chain due diligence and 95% also have public stakeholder engagement policies, suggesting a relatively high degree of commitment and public accessibility regarding corporate policies[24]. This is supported by the fact that all case studies integrate recognised frameworks for sustainability and stakeholder engagement into relevant policies, in particular the Due Diligence Guidance which is used by 85% of case studies and provides comprehensive measures for addressing mineral sustainability in high-risk areas.

[24] Given that policy output 1 and 3 are assessed using similar criteria, the implementation effectiveness and sustainability impact of these outputs are evaluated simultaneously in Section 6.1.

	Policy output	Assessment Criteria	Score	Implementation effectiveness[25]	*Sustainability impact*[26]
Effective mineral due diligence	1	1.1) Appropriate due diligence policy commitment 1.2) Degree to which corporate policies are accessible 1.3) Internal/external stakeholder incorporation into policy development 1.4) Incorporation of mineral due diligence standards/guides	**100%** **100%** **100%** **95%**	**High**	***Medium***
	2	2.1.1) Establish and inform stakeholders of mineral sourcing policy	**100%**	**Medium**	***High***
		2.1.2) Consultation with key stakeholders in developing the commitment/policy	**75%**		
		2.1.3) Negotiate sustainability commitments with suppliers	**22%**		
		2.2.1) Consultation with stakeholders to identify risks	**75%**		
		2.2.2) Collaborate with stakeholders as part of risk assessment (i.e. improving supplier due diligence reporting)	**63%**		
		2.2.3) Partnerships with stakeholders as part of ongoing risk monitoring (i.e. grievance mechanisms) and continual improvement	**22%**		
		2.3.1) Stakeholder collaboration to design and implement risk management	**92%**		
		2.3.2) Use multi-stakeholder partnerships to monitor and track the performance of risk management strategy	**40%**		
		2.4.1) Consultation with stakeholders to audit and verify due diligence practices among SORs	**83%**		
		2.4.2) Collaboration with stakeholders to evaluate due diligence activities and processes	**80%**		
		2.5.1) Report due diligence results to stakeholders in a format which is accessible and provides adequate channels for responses	**100%**		
Meaningful stakeholder engagement	3	3.1) Appropriate engagement policy commitment 3.2) Degree to which corporate policies are accessible 3.3) Internal/external stakeholder incorporation into policy development 3.4) Incorporation of stakeholder engagement standards/guides	**100%** **100%** **100%** **80%**	**High**	***Medium***
	4	4.1) Internal allocation of management responsibility for engagement 4.2) Internal assignment of accountability for engagement management	**100%** **100%**	**High**	***Low***
	5	5.1) Diversity and quality of sources/tools used to research the supply chain and potential business impacts 5.2) Criteria used to assess stakeholder groups (i.e. vulnerability)	**57%** **65%**	**Medium**	***High***
	6	6.1) Degree to which objectives are 1) accessible, 2) focused on stakeholder needs, 3) aligned with corporate policy, and 4) aligned with engagement/sustainability standards	**80%** **63%** **74%** **20%**	**Medium**	***Medium***
	7	7.1) Timely provision of relevant information with stakeholders before engagement 7.2) Degree to which shared information is clear, in an accessible format, and accurate	**80%** **80%**	**High**	***Low***
	8	8.1) Assigning appropriate engagement mode based on the plan, scope and stakeholder group(s) involved in engagement	**65%**	**Medium**	***High***
	9	9.1) Processes in place to support respectful, inclusive and representative stakeholder engagement	**60%**	**Medium**	***High***
	10	10.1) Stakeholders are provided with sufficient time and flexibility to plan engagement activities and represent their perspectives	**80%**	**High**	***Medium***
	11	11.1) Reporting of engagement activities and remediation plans back to stakeholders 11.2) Stakeholder consultation to ensure their concerns are adequately addressed/incorporated into follow-up remediation planning	**97%** **65%**	**High**	***Medium***
	12	12.1) Internal processes for monitoring and evaluating engagement 12.2) Two-way engagement with stakeholders in monitoring/evaluation processes	**97%** **74%**	**High**	***Low***

Table 7: Table showing the extent to which policy outputs 1 to 12 were effectively implemented by case study companies and the level of impact these measures have in terms of positive sustainability outcomes in the mineral value chain

[25] Implementation effectiveness scores are based on the percentage of case studies who meet assessment criteria for each policy output, resulting in the awarding of High for >75%, Medium for 50-75% and Low scores <50%.

[26] Sustainability impact scores are based on a summary of the argumentation from the conceptual and theoretical frameworks, resulting in the awarding of High, Medium of Low scores for each policy output. The level of implementation effectiveness is also considered when awarding this score.

Awareness of these frameworks and related sustainability risks would feasibly lead to more holistic sustainability management at the corporate-level, which may improve sustainability outcomes. Although, this relationship is not supported by empirical evidence from the academic literature. However, such frameworks do reinforce corporate commitments by providing a standard with which to define objectives/targets, as well as a standard which stakeholders can hold corporate performance accountable to (Lee and Kim, 2009; Raj-Reichert, 2011; Wittstruck and Teuteberg, 2012). Consequently, companies with transparent sustainability policies and reporting processes are generally better at engaging and managing expectations among stakeholders (see The Enough Project, 2010; Deberdt and Jurewicz, 2018; KnowTheChain, 2018).

Despite the widespread adoption of these sustainability frameworks, case study data shows that the level of commitment and compliance to them varies between case study companies. For example, 85% of case studies have adopted the Due Diligence Guidance, yet, 72% do not adhere to its core principle: 'to address risks related to all minerals from high-risk areas'. Data also shows that only 28% of case studies openly commit to addressing all mineral risks from all areas, while 55% focus solely on sustainability risks such as 3TG from the DRC. Highlighting that while corporate policies are a reflection of their values and intentions, this does not necessarily translate into comprehensive delivery of voluntary frameworks such as the Due Diligence Guidance (see also Global Witness, 2017; KnowTheChain, 2018). This undermines the overall sustainability impact of mineral sourcing frameworks and poses questions about the reliability of corporate sustainability policies, as well as corporate accountability to them. However, several exogenous and endogenous factors have a role here. For example, the political, economic and competitive environment strongly influence corporate priorities which change over time, while corporate policies may not reflect these shifts. Additionally, corporate culture, structure and governance may result in the slow implementation of sustainability frameworks or slow reaction to newly identified sustainability risks (Nawrocka, 2008; Law, 2010; Lee and Kim, 2011; Wong, 2013; Liu *et al.*, 2015). Furthermore, state regulations which incorporate frameworks like the Due Diligence Guidance (e.g. Dodd-Frank Act) also face challenges specifying how these should be used, which enables and creates the spectrum of sustainability performance across the electronics industry (The Enough Project, 2010; Deberdt and Jurewicz, 2018; KnowTheChain, 2018).

Yet, legitimate and credible corporate mineral sourcing policies can be supported by two-way engagement with stakeholders, which provides additional knowledge, perspectives, tools and resources for policy development (Wittstruck and Teuteberg, 2012). For example, expert stakeholders can verify corporate policies, providing insight into mineral sourcing risks and engagement practices, as well as relevant frameworks, legislation and management processes. Thus, facilitating the development of more informed and effective policy. This is important because brand companies are critically dependent on a range of stakeholders to establish systems for coordinated and harmonised governance at various scales across the GVC (Nawrocka, 2008; Lee and Kim, 2011; Wittstruck and Teuteberg, 2012). However, data shows that while all companies include various stakeholders in policy development, two-way engagement is predominantly conducted among internal stakeholders (e.g. management staff). Only 22% of case studies engage with supply chain actors like suppliers and industry associations, while 17% engage independent stakeholders like CSOs, independent experts, international organisations and government institutions. This demonstrates a lack of cooperation with external stakeholders in corporate policy development, which also reflects wider issues regarding the lack of leadership and willingness to pursue progressive approaches to supply chain sustainability (The Enough Project, 2010; Hofmann *et al.*, 2015; Amnesty International, 2016; Deberdt and Jurewicz, 2018). Overall, these corporate policy commitments are vital for outlining the foundations for effective due diligence and meaningful engagement, with data showing that case studies demonstrate a high level of implementation effectiveness for policy output 1 and 3. However, the impact of such policies on sustainability governance is considered to be medium, primarily because such policies do not necessarily reflect corporate action, resulting in mixed overall sustainability outcomes.

Policy output 2 focuses on the implementation of stakeholder engagement within the 5 stages of the Due Diligence Guidance, which is considered to have a high sustainability impact. This is due to the widespread use of the Due Diligence Guidance for sustainability governance across all stages of the mineral due diligence process, enabling case study companies to establish long-term and collaborative relationships with supply chain actors

across the GVC (Lee and Kim, 2011; Wittstruck and Teuteberg, 2012; Wong, 2013). For this evaluation, the focus will be on stages 2-5 of the mineral due diligence as stage 1 has been evaluated as part of assessing policy output 1 and 3. Therefore, regarding step 2 of the due diligence process, data shows that 100% of case studies engage with stakeholders as part of reporting due diligence findings. Although, only 75% establish two-way consultation when gathering RCOI data and most often the emphasis is on engaging suppliers (e.g. providing feedback on risk identification methods or RCOI results), rather than collecting data directly from affected stakeholders in high-risk areas. Within this, 63% of companies are actively involved in collaborative efforts with suppliers and SORs to improve due diligence practices (e.g. training and outreach), while approximately 22% have developed partnerships with industry organisations and multi-stakeholder initiatives to share knowledge or due diligence responsibilities in a formalised and ongoing setting. This includes 6 case studies who have developed relationships with CSOs to enhance engagement with supply chain stakeholders (e.g. by facilitating grievance mechanisms). These different levels of cooperation within risk identification highlight that fewer case studies are willing to engage in higher intensity engagement modes. In part, this is a reflection of the increasing costs involved with these different approaches and, despite the resources available to brand firms, many lack the organisational commitment, finances, personnel, expertise and/or leverage over suppliers to effectively implement responsible sourcing commitments (Nawrocka, 2008; Lee and Kim, 2011; Wittstruck and Teuteberg, 2012; Wong, 2013).

For step 3, the data shows that 92% of case studies collaborate with a range of stakeholders as part of risk management strategies. These strategies incorporate various internal and external stakeholders, with internal staff, SORs, industry organisations and suppliers being essential for risk management among most case studies. Despite this high level of collaboration within risk management, only 40% of case studies develop strong multi-stakeholder partnerships with CSOs, industry organisations and international organisations. These stakeholders can provide information, resources, capacity building and expertise in risk management. Although, as with risk identification, the increased transaction costs and transparency required for higher intensity engagement modes may affect the willingness of companies to participate with some external stakeholders, reducing implementation effectiveness. To put this in context, electronics companies operate in a highly competitive market where supply chain relationships and transactions are kept confidential to maintain competitive advantages. However, industry organisations recognise this and have developed systems for appropriate sharing supply chain information publicly and between competing companies (Chien and Shih, 2007; Raj-Reichert, 2011; Liu *et al*., 2015). In doing so, these organisations have been more effective in establishing trust between market actors and pooling corporate resources to promote mineral sustainability (Resolve, 2010; The Enough Project, 2010; Raj-Reichert, 2011; Wittstruck and Teuteberg, 2012; Jameson *et al*., 2016; Young, 2018). Although, organisations such as the RBA are criticised for promoting sustainability as a way to increase competitive advantage, rather than pursuing long-term sustainability or addressing deep-rooted political, cultural and economic problems across the GVC (Chien and Shih, 2007; The Enough Project, 2010; Raj-Reichert, 2011; Prenkert, 2014; Jameson *et al*., 2016). Consequently, to increase sustainability impact within risk management there is a need to encourage electronics companies to engage in broader multi-stakeholder initiatives, as well as for industry bodies to include independent stakeholders (e.g. CSOs) on an equal and long-term basis (Raj-Reichert, 2011; Fransen and Conzelmann, 2015).

When evaluating mineral due diligence as part of step 4, 83% of case studies consult with independent stakeholders to verify due diligence practices among SORs. Primarily this involves engaging with third-party auditors or industry organisations, both of which collect independent information on SORs to evaluate mineral sourcing practices among strategic actors within the GVC[27]. The data also highlights that 50% of case studies collaborate directly with supply chain actors to conduct these evaluations (i.e. using an internal auditing team).

[27] The RBA approve independent auditors using the ISO 17011, the international standard for accrediting certification/assessment bodies. This is designed to verify that auditors have appropriate experience and expertise, and that there is no conflict of interest when undertaking RMAP audits for SORs. Approval is also supported by training courses on RMAP's audit protocols and procedures, in addition to the pre-requisite training/certifications/experience (RBA, n.d.).

Proactive case studies may do this themselves to verify new SORs within their supply chains and reinforce data provided by industry organisations. However, data shows that 20% of case studies evaluate supply chain actors without corroboration from external organisations. Such an approach is criticised by some authors due to its lack of transparency and verification by impartial third-party organisations, potentially undermining the reliability, effectiveness and sustainability impact of the Due Diligence Guidance (Enough Project, 2010; OECD, 2013; Distelhorst *et al*., 2015). Additionally, step 4 involves the evaluation of internal due diligence processes at the corporate-level, enabling electronics companies to review and amend mineral sourcing practices to increase effectiveness. Here, data shows that 80% of case studies adopt a collaborative approach with stakeholders and, within this, industry bodies are the most widely engaged. This highlights that case studies are willing to share information and knowledge at the industry-level, although, only around 10-20% of case studies make efforts to involve non-industry stakeholders (e.g. CSOs, government bodies, adversely affected stakeholders) or participate in multi-stakeholder initiatives. This may undermine the overall sustainability impact of such measures due to the limited input of knowledge or concerns from independent actors. Potentially resulting in a bias towards industry-oriented risk management which attracts some criticism within academic and civil society research, as well as an underrepresentation of certain risks or stakeholders not prioritised by industry and corporate decision-makers.

Finally, within step 5 all case studies report due diligence performance to stakeholders in an online format, most case studies offer this in various languages and different formats if requested (e.g. paper copy). Moreover, 55% of case study companies are legally obliged to submit mineral sourcing reports as part of supply chain transparency legislation like the Dodd-Frank Act, which are also publicly available via online databases (e.g. SEC website). Although, some case studies choose not to publish these reports separately on their corporate websites, instead, condensing the information down to incorporate into CSR or sustainability reports. This raises some questions regarding the transparency, completeness and accuracy of due diligence reporting. To address such concerns, 70% of case studies use reporting standards like the GRI guidelines to monitor and evaluate the reporting process. Data also shows that 80% of case studies consult with internal and external stakeholders as part of evaluating sustainability reporting, providing some sort of review of reporting practices and feedback on stakeholder expectations or needs. Yet, 30% of case studies go a step further to establish a more inclusive and on-going dialogue with stakeholders, for example, as part of multi-stakeholder advisory groups. This represents the most inclusive and comprehensive way to evaluate mineral due diligence reporting.

6.2 Stakeholder Engagement Effectiveness

Top management support and commitment are vital for embedding criteria for meaningful engagement into corporate policy and decision-making, as highlighted by policy output 4 (Lenox *et al*., 2000; Law and Gunasekaran, 2012; Wittstruck and Teuteberg, 2012; Govindan *et al*., 2013; Wong, 2013). This influences the internal culture, structure and governance of key issues like sustainability and how processes such as stakeholder engagement are employed to meet policy commitments. For policy output 4, data shows that all case studies demonstrate how stakeholder management duties are delegated internally. Although, some distinctions can be made between the different approaches adopted by case studies. Traditionally, routine management responsibilities tend to fall to departmental superiors, who report to senior staff, executive board members or a dedicated sustainability committee with general oversight and accountability. Yet, among case studies, 57% have established autonomous and cross-functional due diligence teams to facilitate the vertical communication of sustainability risks from the bottom-up, while also making the top-down chain of command for sustainability clear and more direct (Chien and Shih, 2007; Lee and Kim, 2011; Wittstruck and Teuteberg, 2012; Wong, 2013). In doing so, this enhances communication between stakeholders and increases the efficiency with which relevant actors are incorporated into sustainability monitoring, strategy and governance (Lenox *et al*., 2000; Wittstruck and Teuteberg, 2012; Govindan *et al*., 2013; Wong, 2013; Hsu and Chang, 2017). This highlights the fundamental role of setting clear and robust responsibilities for stakeholder management. However, the overall sustainability impacts of this can be considered to be relatively low, given that all case studies have assigned stakeholder responsibilities/accountability and still the implementation of corporate sustainability policies differs between companies due to various endogenous and exogenous factors involved (as outlined in Section 6.1).

Next, data for policy output 5 shows that on average case study companies use 6 different tools to identify stakeholder groups. Data also highlights that generally case studies which use fewer tools also focus on lower-quality approaches such as stakeholder surveys, data collected by industry organisations or other organisations, as well as generic channels for stakeholder feedback (e.g. support/complaint inbox or phone line). However, 57% of case studies used above the average of 6 tools for stakeholder identification, demonstrating a more diverse use of methodologies as well as the use of higher quality tools like impact assessments and field research. These methods can be considered higher quality and more effective than others since they involve primary data and direct analysis of stakeholders groups, making these more likely to produce informed results which are up-to-date and relevant to the operating context of that company. Additionally, 47% of case studies incorporate third-party organisations into stakeholder identification. These independent experts and CSOs can provide tailored support for stakeholder identification and can operate tools such as grievance mechanisms, which can also make stakeholder identification more effective, transparent and legitimate.

Having profiled stakeholders, on average case studies use 4 criteria to assess and prioritise certain stakeholder groups. Within this, over 70% of case studies incorporate stakeholder needs into their assessment criteria, demonstrating a willingness to incorporate information gathered from stakeholder research, engagement or feedback. Although, generally, case studies which utilise fewer criteria to assess stakeholders tend to focus on less well-defined and less effective criteria. This includes internal factors (e.g. company policy and procedures), risks and opportunities, as well as relevance to the due diligence context. While these are credible, incorporating a wider range of criteria into stakeholder analysis provides a more holistic comparison of stakeholder importance in relation to the scope and purpose of engagement (AccountAbility, 2015). Furthermore, engagement frameworks outline structured approaches for the analysis of stakeholder groups and various criteria that should be used for effective stakeholder evaluation. Given this, the data shows that 60% of case studies use 4 or more criteria to evaluate stakeholder groups and 65% of case studies incorporate one of the recognised engagement frameworks into stakeholder analysis. This gives an understanding of the overall quality with which case studies assess and prioritise stakeholders. The use of engagement frameworks is particularly beneficial as it demonstrates corporate policy commitment to a certain standard, while also supporting more effective relationships and cooperation with stakeholders (Krick *et al.*, 2005; Taylor and Bancilhon, 2019). Overall, stakeholder identification and analysis are considered to have a high level of impact on sustainability. This is because it is a pivotal stage in the engagement process, providing valuable knowledge and awareness that supports the implementation of various policy outputs for meaningful engagement. Despite this, very few electronics companies conduct impact assessments or field research within their supply chain or analyse identified stakeholders based on key issues like vulnerability. Yet, this exercise is also challenging, particularly when identifying or assessing upstream stakeholders in isolated regions, who are also among the most adversely affected stakeholders in the mineral value chain (e.g. ASM workers, mining communities, or minority and marginalised groups like female or child labourers).

Engagement planning involves setting appropriate objectives to define the nature and context of engagement, as outlined by policy output 6. In this context, appropriate objectives are evaluated based on various factors, including 1) accessibility to stakeholders participating in engagement (e.g. formatting, phrasing and language use); 2) incorporation of stakeholder needs into engagement objectives; 3) the alignment of objectives with corporate policy; and, 4) the alignment of objectives with international engagement standards. In evaluating this policy output, data shows that 80% of case studies make objectives available to stakeholders before engagement activities (incorporating data from assessment criteria 7.1). Although, this is not a true evaluation of all aspects of accessibility as it only shows how many case studies share information with stakeholders, not the quality of this shared information. Furthermore, 63% of case studies incorporate stakeholder needs or expectations into engagement objectives, while 74% align objectives with corporate strategy and 20% with engagement or sustainability frameworks. This illustrates that the majority of case studies are focused on incorporating internal strategy and goals into engagement objectives, often alongside stakeholder concerns/issues/expectations. Despite this, only a minority go a step further to build meaningful engagement into engagement policy by using relevant engagement or sustainability frameworks, as well as incorporating additional support into engagement planning to aid equal and fair stakeholder participation. This is reflected in the medium

level of implementation effectiveness among case studies for policy output 6. Moreover, despite being a critical element in planning meaningful engagement, the sustainability impact of engagement objectives is also limited to medium. This is because the setting of objectives is largely a reflection of corporate values and policy, with only 11% of case studies actively incorporating stakeholder feedback at this stage.

As outlined by policy output 7, effective engagement planning also encompasses informing stakeholders about the context and objectives of engagement activities, as well as providing other relevant information/documents. This provides the stakeholder(s) with an opportunity to review, prepare for and provide feedback on engagement plans which can also support more open and equitable engagement (OECD, 2016; Taylor and Bancilhon, 2019). Evaluating policy output 7 demonstrates that 80% of case studies use initial engagement with stakeholders to notify them of engagement plans. This is generally fairly low intensity with a limited quantity of information being communicated, often focusing on one-way reporting. As a result, there are significantly fewer internal or external factors which can influence the degree of quality with which information is exchanged, compared to more complex engagement. Therefore, it can be assumed that all of the case studies which engage case studies at this point, do so to an appropriate degree of clarity, accessibility and accuracy. Although, it is worth noting that the appropriate level of engagement at this stage will vary situationally and based on the stakeholder(s) involved. For example, routine engagement with close suppliers requires only limited information to be exchanged. However, stakeholders without these existing relationships may require more complex information or support, particularly groups which are vulnerable, isolated or lack a means of formal representation. To address this, some case studies provide additional support or information to such stakeholders. This includes 23% of case studies which incorporate provisions in engagement plans to facilitate stakeholder participation (e.g. reimbursement of engagement costs, access to translators, visa support if travelling internationally), as well as 20% of case studies provide additional preparatory information or resources (e.g. stakeholder rights, relevant frameworks). In doing so, reducing the barriers to stakeholder participation and establishing support systems for more meaningful and long-term engagement. On the whole, the implementation effectiveness policy output 7 is rated high, given that most case studies inform stakeholders of engagement plans and some also provide stakeholders with support systems. Yet, as engagement focuses largely on rudimentary one-way reporting and has a minimal impact on the overall engagement process, the sustainability impact of policy output 7 is low.

Assigning an appropriate engagement mode is among the most critical stage of implementing meaningful engagement and defines the level of communication, engagement intensity and overall nature of the relationship with the stakeholder group(s) (AccountAbility 2015; OECD, 2016). Consequently, policy output 8 is considered to have a high impact on sustainability, this is because assigning an appropriate mode of engagement directly influences the engagement outcomes as well as the ongoing relationship with stakeholder(s) involved. Yet, the most appropriate mode of engagement will vary based on the context of the engagement, as well as with each step in the due diligence process (OECD, 2016; Taylor and Bancilhon, 2019). If an incorrect mode is used or it is poorly implemented this can have a range of negative consequences on engagement (GCNG 2014). To prevent this, a bespoke approach is required to find the optimal mode for each engagement. A key part of this decision-making process is to bring together stakeholder research, engagement planning and feedback from any initial information sharing with stakeholders to establish which mode is best tailored to the engagement scope, objectives and stakeholder needs (AccountAbility, 2015). Based on this, an average score for policy output 8 is produced using policy outputs 5, 6 and 7 to assess the number of case studies which incorporate corporate strategy, engagement objectives and research on stakeholder needs into engagement planning. This highlights that 65% of case studies follow the processes for assigning the appropriate mode of engagement when implementing stakeholder engagement, which represents a medium level of implementation effectiveness. Yet, data also suggests that case companies focus their resources and priorities on engaging certain stakeholder groups more often and to a higher level of intensity, in particular industry-level and internal corporate stakeholders. This allows case studies to develop strong relationships with these stakeholders but can also highlight the areas where companies can influence stakeholders (or be influenced themselves) regarding responsible mineral sourcing practices. Here, further investigation into the use of different modes of engagement among corporations would provide much greater insight into how stakeholder engagement is conducted among large corporations. Although

this remains an area with only limited study due to limited data availability, either because this data is not recorded by companies or shared transparently with external stakeholders for use in research.

As well as assigning and implementing the correct mode of engagement, it is also essential to create meaningful opportunities for stakeholder interaction by implementing engagement which is representative, inclusive and respectful (OECD, 2016; Taylor and Bancilhon, 2019). These principles directly influence the stakeholder interaction within engagement, creating opportunities for building mutual understanding and trust as part of long-term relationship-building between stakeholder(s) (GCNG, 2014). In terms of evaluating the implementation of policy output 9, these principles are subjective and difficult to measure or implement. In this context, understanding how/when to engage appropriately is vital for providing the appropriate level of support at the right time, as well as ensuring that all engagement efforts are sensitive to stakeholder culture, values and needs. This requires adequate resources, stakeholder research and experienced staff involved in engagement implementation. Evaluating policy output 9 shows that 91% of case studies have at least one method of facilitating representative, inclusive and respectful engagement. However, a high proportion of case studies utilise less effective measures such as operating grievance mechanisms and internal staff training, which do not directly influence meaningful engagement. Excluding these highlights that 60% of case studies have appropriate processes in place. Despite this, some stakeholders may inherently distrust large corporations and be resilient to relationship-building efforts. Based on this, policy output 9 is also considered to have a high impact on sustainable mineral governance.

Meaningful engagement also requires that engagement modes are implemented over a suitable timescale before, during and after the engagement activities, giving all actors involved sufficient time to plan, share perspectives and execute any remediation or follow-up actions (OECD, 2016; Taylor and Bancilhon, 2019). Engagement timescales which are too short or too long can undermine meaningful outcomes by impacting the ability or willingness of stakeholders to participate (GCNG 2014). For example, stakeholders may find participation too costly in terms of time and resources if engagement is over a prolonged period, while they may feel undervalued and demotivated if not allocated sufficient time or means to share perspectives. On-top-of-this, flexibility is also important when planning engagements, particularly among stakeholders with high barriers to engagement or facing considerable external pressure (GCNG 2014). For example, less well-organised stakeholders in communities, isolated regions or active conflict zones may benefit from a more tailored and supportive approach. The data itself highlights that 80% of case studies interact with stakeholders prior to engagement activities, providing an opportunity to share engagement plans but also to listen to stakeholders and integrate additional needs or concerns into decision making. This transparent and cooperative approach allows all stakeholders to negotiate the engagement timescale if needed, as well as the time required for stakeholders to plan, participate in and follow-up on the engagement activities. Considering that policy output 10 supports more effective stakeholder engagement but does not influence meaningful outcomes as much as other policy outputs, it is considered to have a medium impact on sustainability.

For engagement to be meaningful it must also produce outcomes which meet the engagement objectives based on the needs of all actors involved. In the context of mineral sustainability, engagement outcomes will likely involve some sort of agreed action plan between the case study company and stakeholder(s) to mitigate, manage and/or remedy identified risks or stakeholder concerns. As outlined in Section 3.1, those risks which can be directly addressed by the lead company should be incorporated into a remediation action plan, which defines the remediation responsibilities and commitments for all actors involved, as well as timelines for implementation (OECD, 2016; Taylor and Bancilhon, 2019). As part of this, ongoing communication with stakeholders after the engagement is important for many reasons. For example, remediation may involve collaboration with suppliers or other relevant stakeholders to address sustainability risks, as well as reporting to stakeholders on remediation progress and understanding whether these are consistent with stakeholder expectations. When done effectively, this sharing of information supports management and mitigation of sustainability risks, as well as building trust and strengthening relationships with stakeholders (OECD, 2016). Overall, 97% of case study companies maintain communication with stakeholders following engagement activities, demonstrating a high degree of

implementation effectiveness for policy output 11. Although data shows that the majority of case studies tend to focus on simply informing/reporting to stakeholders as part of remediation. Only around 65% of case studies utilise higher intensity approaches to continue to support stakeholders or gather data and stakeholder feedback to improve practices. Here, two-way engagement enables companies to understand if risks have been appropriately remedied, while also providing a degree of transparency for stakeholders about what action has been taken and whether it meets the agreed plan. Using follow-up engagement in this way can be more effective for addressing risks with the support of stakeholders involves and producing meaningful outcomes, particularly as it shows that there is a willingness to maintain and build on the stakeholder relationship. Based on this assessment, policy output 11 is also considered to have a medium level of sustainability impact, due to its role in supporting meaningful engagement but not having as much influence on meaningful outcomes as other policy outputs.

The final aspect of meaningful engagement requires that case study companies develop a means for monitoring and evaluating engagements. This enables companies to assess whether engagement has met its stated objectives but can also be used for the broader evaluation of how engagement was implemented, incorporating engagement strategy, planning, activities, outcomes and reporting. By doing this, case study companies can understand the strengths and weaknesses of that engagement, feeding back into the improvement of internal processes, tools and knowledge relating to stakeholder engagement (OECD, 2016; Taylor and Bancilhon, 2019). Stakeholder participation and two-way engagement in this process also add direct feedback which can be incorporated into continual improvement, as well as increasing stakeholder relationships and the credibility of the engagement process. The case study data shows a high degree of implementation effectiveness for policy output 12, with 97% of companies in the study utilising some kind of system to monitor and evaluate stakeholder engagement practices. To a large extent, case study companies focus on internally reviewing engagement processes without involving external stakeholders or employ low-intensity methods such as public feedback channels (e.g. grievance mechanisms or online surveys). Despite this, 74% of case studies incorporate two-way communication with external and internal stakeholders when reviewing engagement processes. These case studies also widely incorporate sustainability and engagement frameworks like the GRI and RBA code of conduct into review processes, as well as stakeholder advisory groups. Overall, companies which involve more stakeholder groups in engagement monitoring/review can be considered to have the most robust approach and, if effectively implemented, this will help the continual development of engagement practices and strengthen relationships with stakeholders. Yet, policy output 12 is considered to have a relatively low impact on sustainability outcomes, this is predominantly because fewer companies involve a diverse range of stakeholders in review processes. Additionally, most case study companies have established processes for stakeholder engagement and incremental improvements in engagement processes have minimal impact on outcomes compared to other policy outputs.

7. Implications of this study for industry, state and civil society stakeholders

The purpose of this thesis is to establish new empirical research on corporate mineral sourcing and stakeholder engagement practices in the mineral value chain. This is grounded in theoretical perspectives and concepts within these discourses which aid critical analysis of mineral sustainability within the broader paradigm of environmental governance. In this context, the landscape of mineral sustainability governance consists of a *milieu* of actors, institutions and instruments which are interrelated but often act separately, while also operating at different scales and locations globally (Abbott and Snidal, 2009; Driessen *et al.*, 2012). The primary challenge confronting this somewhat fragmented system of mineral governance is the equally complex and fragmented nexus of relationships and exchanges that exist between actors at various tiers in the mineral value chain, as well as the various mineral transformations and amalgamations involved in the mining, trading, processing, smelting, manufacturing processes in which minerals are used to produce electronic components and devices. The characteristics of the mineral value chain and fragmentation of governance responsibilities between actors both serve to undermine successful sustainability governance.

Despite this, responsible mineral sourcing is widely established within the electronics industry and there remain opportunities for new governance approaches to evolve (Abbott and Snidal, 2009; Vermeulen, 2010; Fransen and Conzelmann, 2015). As outlined in this thesis, market-oriented governance coordinated by electronics MNC and incorporating various downstream companies is recognised as a core part of sustainability efforts in the mineral value chain. State and industry institutions also play a critical role in establishing industry-wide standards and frameworks for mineral sustainability derived from internationally agreed mandates such as the UNGPs, UDHR and ICGLR (The Enough Project, 2010; Raj-Reichert, 2011). Yet, many authors also recognise the potential of interactive and multi-stakeholder arrangements as a way to push sustainability beyond current standards or obligations (Resolve, 2010; Driessen *et al.*, 2012; Jameson *et al.*, 2016; Martin-Ortega, 2018; Evans and Vermeulen, 2020). For example, while electronics MNCs are principally responsible for governing mineral sourcing practices within their supply chain, engaging with a range of external stakeholders supports sustainability governance by harmonising the roles of state, market and civil society actors within a multi-stakeholder approach (see KnowTheChain, 2018). Such approaches can benefit from the input of each individual actor in terms of corporate resources and supply chain influence, state regulatory power and legitimacy, as well as the credibility provided by independent CSOs with local-scale knowledge and expertise in stakeholder/risk management. Moreover, linking local, national and international actors through multi-stakeholder governance enables actors to share responsibilities and increase capacity, as well as developing broader and cohesive approaches for addressing sustainability risks across the mineral value chain.

To assess the extent and role of stakeholder engagement within corporate mineral governance practises, this thesis has analysed how electronics companies incorporate stakeholders into effective mineral due diligence and how meaningful stakeholder engagement is implemented at the company-level. From this, it is clear that electronics companies perform strongly in the development of policies for conducting stakeholder engagement and mineral due diligence measures. Although, comparing how companies implement these policies demonstrates the differing approaches used within the electronics industry, resulting in various policy outputs for mineral governance and a spectrum of sustainability outcomes in the mineral value chain. Further analysis focused on assessing and evaluating the corporate implementation of 12 key policy outputs outlined in the conceptual framework, as well as the wider sustainability impact of each of these policies. This was used to identify key areas where poorly performing case study companies should improve implementation of effective due diligence and meaningful engagement policies, as well as highlighting the solutions and best practices used by leading case study companies. As shown in Table 8, various recommendations for the electronics industry have been developed based on this analysis, emphasising critical areas where electronics companies can maximise sustainability outcomes when allocating scarce resources to responsible mineral sourcing and sustainability governance.

Overall, this thesis reflects literature highlighting the disconnect between corporate supply chain sustainability policies, their implementation, and public sustainability reporting (e.g. Global Witness, 2017 and KnowTheChain, 2018). The cause of this disparity is partly rooted in endogenous factors at the corporate-level, for example, a lack of organisational commitment, differing financial priorities, limited or inexperienced personnel, as well as a lack of supply chain leverage (Nawrocka, 2008; Lee and Kim, 2011; Wittstruck and Teuteberg, 2012; Wong, 2013). This is compounded by various exogenous factors which also influence sustainability governance. For example, governance gaps are created by weak regulatory capacity in source countries and the voluntary nature of standards like the Due Diligence Guidance. Consequently, in 2018 only 45% of 3TG exporting companies in the DRC published due diligence reports, despite it being a legal requirement in the DRC and despite efforts by downstream MNCs to govern upstream actors in adherence to supply chain transparency policies like Dodd-Frank Act (Global Witness, 2017). Demonstrating that sustainability standards are more difficult to enforce and less widely implemented among distant upstream suppliers (Nawrocka, 2008; Raj-Reichert, 2011). These indirect suppliers operate at higher tiers in the GVC and are under less pressure from market, government and civil society stakeholders to participate in sustainability governance (*ibid*). Moreover, without adequate downstream support, smaller upstream companies often lack the capabilities or incentives to participate (*ibid*). Outlining the need for more collective and multi-stakeholder approaches to sustainable mineral governance.

	Policy output	Policy Recommendations	*Sustainability impact*
Effective mineral due diligence	1	• Use two-way engagement with relevant stakeholders to verify that policy commitments and targets are in line with relevant frameworks, legislation, internal capabilities and stakeholder expectations • Incorporate management staff into policy commitments to ensure conversion into management objectives and actions	***Medium***
	2	2.1 • *see policy output 1*	***High***
		2.2 • Gather and analyse RCOI data using dedicated mineral verification process (e.g. RMAP) • Provide training and support to suppliers for more accurate, up-to-date and quality RCOI data • Maintain two-way communication channels with organisations on-the-ground (e.g. multi-stakeholder organisations or CSOs) to directly raise awareness of potential risks	
		2.3 • Establish strong internal systems to support effective risk management (e.g. cross-functional due diligence team, organised data management, provision of internal training and resources) • Collaborate with multi-stakeholder organisations as part of collective and continual risk management at various levels in the mineral value chain	
		2.4 • Consult with independent stakeholders/auditors into SOR verification to ensure transparency and credibility • Evaluate due diligence practice using two-way communication with a range of internal and external stakeholders to ensure that practices are transparent, fair and effective	
		2.5 • Evaluate due diligence reporting using two-way communication a range of stakeholders (e.g. multi-stakeholder focus groups) to ensure it is accessible, relevant and accurate	
Meaningful stakeholder engagement	3	• *see policy output 1*	***Medium***
	4	• Outline roles and responsibilities for managing stakeholder relations to support an efficient and effective chain-of-command	***Low***
	5	• Adopt varied methodology for profiling relevant stakeholder groups to support the collection of detailed and accurate data (ensure data is easily accessible for use throughout the engagement process) • Use a wide range of criteria for analysing/prioritising stakeholder groups to ensure a thorough and representative stakeholder assessment in relation to the scope and purpose of engagement	***Medium***
	6	• Build meaningful engagement into engagement objectives by using recognised engagement frameworks, this supports well-developed objectives which meet corporate objectives and are representative of stakeholder needs/expectations	***Medium***
	7	• Consult with stakeholders regarding engagement objectives and plans in a way that is transparent and accessible, providing an opportunity for stakeholders to review and plan for engagement	***Low***
	8	• Engage with stakeholders to the appropriate level of intensity based on the engagement objectives, plans and wider context, while also incorporating stakeholder needs and expectations. This is supported by detailed stakeholder data (output 5), coherent engagement objectives/strategy (output 6) and stakeholder review of engagement plans (output 7)	***High***
	9	• An experienced engagement team, appropriate resources for engagement and detailed stakeholder data are all key for implementing meaningful engagement and ensuing that stakeholders feel represented, fairly treated and respected	***High***
	10	• Engagement timelines must complement the mode of engagement and allow appropriate time for stakeholders to participate in the engagement. Again, this can be supported by detailed stakeholder data (output 5), coherent engagement objectives/strategy (output 6) and stakeholder review of engagement plans (output 7)	***Medium***
	11	• Communication of remediation plans and progress supports the management of stakeholder expectations and ensures remediation activities are appropriate. • Ongoing two-way engagement with stakeholders allows them to participate in continual risk identification and management, making the process more efficient and effective	***Medium***
	12	• Review of engagement practices allows for continual improvement and development in engagement strategy, planning, implementation and remedy processes. Consulting with stakeholder as part of this provides an additional level of evaluation and feedback from independent actors, which also increases the credibility and trust of corporate engagement.	***Low***

Table 8: Policy recommendations for the electronics industry based on analysis of the implementation effectiveness and sustainability impact of policy outputs 1 to 12.

Industry organisations have a role here in regulating and facilitating sustainability governance across the mineral value chain and supporting the electronics MNCs manage their supply chains. For example, the RBA aggregates leverage among downstream firms and uses this to coax other supply chain actors into sustainability management initiatives (Evans and Vermeulen, 2020). As part of this, the RBA have established industry-wide sustainability requirements as well as programs to incentivise the participation of upstream companies in responsible mineral sourcing, while also having developed standardized tools and platforms for exchanging sensitive supply chain information (Chien and Shih, 2007; Raj-Reichert, 2011; Liu *et al*., 2015). By doing so, industry organisations reduce the complexity and transaction costs involved in corporate sustainability management, at the same time strengthening trust between market actors and pooling collective resources to promote more effective management (Resolve, 2010; The Enough Project, 2010; Raj-Reichert, 2011; Wittstruck and Teuteberg, 2012; Jameson *et al*., 2016; Young, 2018; Evans and Vermeulen, 2020). Yet, industry organisations are criticised for failing to engage with non-industry stakeholders on an equal and long-term basis, in particular CSOs. In large part, this is due to ideological differences on issues like freedom of association and worker empowerment (Raj-Reichert, 2011; Fransen and Conzelmann, 2015). This demonstrates insufficient leadership and willingness to increase supply chain transparency at the industry-level, undermining multi-stakeholder interaction while also restricting independent verification of market governance approaches. Consequently, market-led sustainability governance can lack credibility and is often treated with suspicion by CSOs and other independent stakeholders, who argue that corporate sustainability efforts are strategic and limited to measures which maximise corporate profitability and brand image (Overeem, 2009; Evermann, 2014; Cook and Jardim, 2017).

In this context, the electronics industry should take lessons from the garment sector where established multi-stakeholder initiatives are used to address sustainability risks in global supply chains (Overeem, 2009; Fransen and Conzelmann, 2015). Within this sector, supply chain transparency is critical and enables the buyers to know where and how products are made, making downstream brand companies accountable for sustainability risks in the supply chain while also allowing ethical certification, consumption and investment habits to contribute to improving sustainability (Evermann, 2014; Fransen and Conzelmann, 2015; Stauffer, 2017). This reflects civil society literature which advocates for the disclosure of supply chain information within the electronics industry, involving detailed corporate reporting (including the name and location of suppliers, SORs, mineral source locations etc.) as well as a shift towards multi-stakeholder initiatives at the industry-level (e.g. Global Witness, 2015; Stauffer, 2017; Callaway, 2018). Allowing a wider range of stakeholders to participate in sustainability governance not only increases transparency but can support electronics MNCs in overcoming the limitations of market governance and more effectively implement sustainable mineral sourcing measures. Here, Ostrom's studies of polycentric governance highlight that trust-building and reciprocal agreements can facilitate mutual learning, cooperation and commitment within environmental governance (Ostrom, 2010). For example, working with CSOs to facilitate grievance mechanisms can help protect whistle-blowers and support the identification of upstream sustainability risks. These CSOs can also train workers across the mineral value chain in monitoring compliance to sustainability standards, reinforcing efficient risk identification and management. Thus, forming part of a multi-level and collective approach for corporate compliance to sustainability standards (Overeem, 2009; Raj-Reichert, 2011; Martin-Ortega, 2018; Evans and Vermeulen, 2020).

However, it is increasingly clear that the intensive use of finite mineral resources to feed consumer demand and global economic growth will add pressure on global markets and supply chains. Most likely this will result in increased incidence and impact of sustainability risks, particularly on already vulnerable populations, while rising mineral prices intensify mineral-related conflicts globally. Arguably, this situation is comparable to our socio-economic relationship with other critical natural resources, such as fossil fuels, as easily accessible stocks are declining for many minerals and the extraction of these raw materials is leading to growing consequences for sustainability. The speed and scale of these impacts are without precedent, fueled by the unsustainable production, consumption and disposal of consumer goods. Highlighting the need to address mineral sourcing as part of broader discussions taking place within circular economy literature, which focus on shifting the current model of production and consumer culture away from the idea of cheaper, better, quicker electronics. This includes a range of strategies to lessen the environmental and social impact of electronics, including 1) sustainable

product design to reduce mineral use, utilise recycled materials, or increase product durability and lifetime; 2) the repairing, remanufacturing or reselling of existing electronics devices to make use of existing electronics parts and devices; and 3) 're-mining' or recovering minerals from obsolete devices (O'Connor *et al.,* 2016; Reike *et al.*, 2019). By integrating sustainability into product lifecycles and pushing for a more 'closed-loop' approach, the electronics industry can considerably reduce its negative impacts across the mineral value chain. In this regard, the social enterprise *Fairphone* demonstrates that it is possible to develop and retail a 'conflict-free' mobile phone (see Schippler, 2015). Additionally, CSOs like makeITfair have successfully used research and consumer campaigns to educate the public on sustainable consumption and lobby for change among industry and state policymakers. Despite this, electronics sustainability remains a relatively limited discourse and is at an early stage in terms of research and product availability, which is reflected in the lack of well-established and influential multi-stakeholder sustainability initiatives in the electronics sector. Meaning that consumers only have limited options for truly sustainable electronics which consider the social, environmental and economic costs of that device throughout its lifecycle. This tends to restrict the ability to consider and purchase ethical electronics to those of high socioeconomic status. However, there is mounting public will and political motivation to address sustainability risks in electronics supply chains, particularly related to conflict minerals which may represent a tipping point for addressing further sustainability concerns associated with electronics. Such challenges to our assumptions and norms regarding the current economic model and patterns of production or consumption are fundamental for further progress in responsible mineral sourcing, as well as broader sustainability governance in global supply chains.

8. Conclusion

In conclusion, it is clear that the demand placed on global mineral resources by modern society results in a range of sustainability risks across the mineral value chain and, while this is a global issue, the negative impacts manifest in communities and ecosystems at the local-scale which disproportionately impact populations in developing countries. However, growing awareness of these mineral-related sustainability risks among policymakers has resulted in various initiatives, frameworks and regulations focusing on supply chain due diligence. As such, frameworks like the Due Diligence Guidance are widely used as tools for effectively governing responsible mineral sourcing within the electronics industry. As part of this landscape for sustainable mineral governance, it is clear that downstream electronics companies, in particular electronics MNCs, bear the responsibility to conduct mineral due diligence because of their role as mineral end-users and leverage over midstream/upstream suppliers. Yet, the mineral value chain is complex and commodities are exchanged between numerous tiers of globally distributed supply chain actors. Therefore, engaging with various stakeholders is an important prerequisite for overcoming this complexity and is fundamental to the effective identification and management of sustainability risks in the mineral value chain.

By assessing how and when electronics MNCs engaged with stakeholders as part of mineral due diligence measures, this thesis analyses the overall effectiveness of responsible sourcing efforts among electronics MNCs. The research highlights that corporate policies on mineral due diligence and stakeholder engagement are well established in the electronics industry, showing that sustainable mineral sourcing has become cemented under the broader remit of CSR and corporate sustainability. Despite this, analysis of corporate literature shows that case studies use differing outputs (independent variables) to apply these policies in practice (e.g. tools, plans, regulations), resulting in varied outcomes for sustainability governance in the mineral value chain (dependent variable). By further investigating how these corporate practices compare to the 12 recommended policy outputs in the assessment framework, this thesis evaluates how due diligence and stakeholder engagement are implemented among 35 case study MNCs. In doing so, research focuses on key areas where poorly performing case studies should improve implementation of due diligence and meaningful engagement policies, as well as highlighting solutions and best practices used by leading case study companies. This feeds into the development

of recommendations for the electronics industry on how due diligence and stakeholder engagement policies can be more effectively implemented, while also emphasising critical policy areas where companies can maximise sustainability outcomes. Thus, answering research question 1. Additionally, to support this, theoretical literature is also examined to identify corporate-level factors (endogenous and exogenous) that influence corporate policy outputs and outcomes regarding mineral due diligence, while also providing an insight into how to apply lessons learnt on successful stakeholder engagement to wider supply chain governance. Addressing research question 2.

In summary, thesis serves to directly inform state, corporate and industry policymakers to how to build more effective due diligence and stakeholder engagement policy, while also increasing understanding on the significance of the relationship between meaningful stakeholder engagement and effective mineral due diligence. Furthermore, electronics MNCs at the forefront of sustainability governance should use these results to encourage progressive policy change among laggard companies and industry organisations. In a similar vein, this research also outlines the critical role of supply chain transparency and trust-building between actors at different scales and locations in the mineral value chain. Here, the role of interactive and multi-stakeholder approaches to sustainability governance is vital for enabling stakeholders to more collectively identify and develop solutions for sustainability risks (Wittstruck and Teuteberg, 2012; Martin-Ortega, 2018). Within this, CSOs also have a critical role in supporting and validating corporate sustainability efforts, while using supply chain research and communication channels to advocate for wider systemic change. For example, leveraging policy change among companies which fail to meet sustainability standards, as well as incorporating sustainability into the development processes (i.e. in mining areas), while also educating consumers on sustainable consumption and procurement (Evans and Vermeulen, 2020).

Although, in conclusion, it would be a fallacy to assume a normative position that more interactive approaches will facilitate more effective sustainability governance. The scope of the electronics value chain is vast and involves hundreds, if not thousands, of supply chain actors and ongoing mineral exchanges. Thus, making managing sustainability risks a challenge for any system of governance. While multi-stakeholder approaches can spread responsibilities between actors and reduce the individual burden of governance on electronics MNCs, this also creates cumbersome networks of stakeholders and increases transaction costs as well as reaction times (Evans and Vermeulen, 2020). Instead, the scientific community should critically assess and test how interactions between multiple actors can facilitate opportunities for (formal and informal) institutional change, resulting in the continual improvement of policy addressing mineral sustainability. Furthermore, despite the optimism surrounding interactive governance, there are also barriers to combining top-down governance with intricate local hierarchical arrangements and norms. For example, while all parties may recognise the benefit of information sharing and participation, companies and government authorities are often resistant to changing operating procedures and being inclusive due to a range of cultural, political, economic and logical reasons (Evans & Vermeulen, 2020). Therefore, the development of long-term institutional commitments for interactive governance is a complex and slow process, this approach is also in need of more formal testing within the electronics industry.

Appendices

Appendix 1

Table identifying a list of potential sustainability risks (including impacts on specific human rights) caused by the extraction of minerals. This also includes the potentially affected stakeholders and factors which can exacerbate these impacts if present (Source: Universal Declaration of Human Rights, 1948; OECD 2016).

Issue	**Examples of sustainability risks (*and potential human rights impacts*)**	**Factors increasing the likelihood of impacts (if present)**	**Relevant stakeholder(s)**
Resettlement	Extractive activities can result in displacement and loss of access to traditional lands and livelihoods. Inadequate community engagement can result in poorly planned livelihood restoration programs. ***Potential Rights impact***: e.g. right to an adequate standard of living, right to food, right to health.	Resettlement is the responsibility of national authorities with weak capacity and/or a poor record of engaging with local communities impacted by development projects. The region where resettlement will take place is resource-scarce. Local communities have a unique status (e.g. indigenous peoples) or cultural heritage they would like to protect. Land in question has cultural or spiritual value for local people. Local communities have insecure land ownership/tenure status.	Local communities.
In-migration	An influx of people from outside the area seeking economic opportunities can drive up the cost of housing and food and increase the level of homelessness among vulnerable groups. Cultural rights of previous residents such as indigenous communities may be threatened by in-migration. In-migration can also lead to the creation of tension and conflict, particularly when groups' interests vary (e.g. external workers seeking to protect their jobs). ***Potential Rights impact***: e.g. right to an adequate standard of living including the right to food and housing, right to participate in cultural life, right to life, liberty and personal security.	Local communities have a unique status (e.g. indigenous) or cultural heritage they would like to protect. There are high levels of poverty in the area and few opportunities for employment. There is a scarcity of land and natural resources capable of supporting a large number of migrants. There is insufficient infrastructure to support a large number of migrants. There are large numbers of people belonging to vulnerable groups in the area (e.g. the aged, those in ill health, youth, and ethnic minorities subject to discrimination). Cultural factors exist requiring that extended family members are housed.	Local communities, specifically vulnerable populations and migrant workers.
Access to resources and food security	Open-pit mining can degrade agricultural land. High volumes of water frequently used in extractive activities can deplete local water sources. ***Potential Rights impact***: e.g. right to an adequate standard of living, right to food and right to health.	Local communities are dependent on natural resources for subsistence and livelihood needs. There are high levels of poverty in the area and few opportunities for employment. There are large numbers of vulnerable people in the area. For example, the aged, youth and ethnic minorities. Local communities have insecure land ownership/tenure status.	Stakeholders relying on resources within area of impact.
Security	Private security personnel and/or public security forces may use excessive force to remove landowners protesting peacefully about an overland pipeline that will cross their land. ***Potential Rights impact*** on right to security of person and right to freedom of expression.	Concerns have been raised by human rights groups or others about the lack of basic freedoms in the region and/or country (e.g. freedom of speech, freedom of assembly etc.).	Local communities, advocacy groups or organisations

		There is a history of repression in the region and/or country against people or groups who participate in civil protest. There is a lack of training on human rights issues for security forces.	opposed to the project.
Cultural heritage	Extractive activity can damage areas of cultural and spiritual importance to local communities, in particular indigenous peoples. ***Potential Rights impact***: e.g. right to participate in cultural life.	Local communities have a unique status (e.g. indigenous) or cultural heritage they would like to protect. There are documented sites of spiritual significance or cultural heritage in the area.	Stakeholders with cultural heritage or sites located within area of impact.
Community health	Adverse impacts on local people's health can arise from groundwater contamination or other forms of pollution. In-migration can lead to increased rates of HIV/AIDS and other diseases. ***Potential Rights impact***: e.g. the right to health.	Local communities rely on natural water sources with the area of impact (e.g. rivers, bores) for their daily water needs. Local communities are reliant on land and natural resources in areas surrounding extractive operations for their livelihood. Significant in-migration.	Communities within area of impact or relying on resources within the area.
Gender relations	Men in a community may gain access to employment and economic opportunities and women are excluded, or subject to sexual harassment. An increase in the cash economy can lead to changing power structures. ***Potential Rights impact*** e.g. right to freedom from discrimination.	Civil society organisations or other groups have expressed concerns over discrimination against women or gender-based violence. Limited participation of women informal labour markets. Educational levels and cultural factors.	Local communities, particularly women.
Social change	Increased number of people from outside the area and availability of cash in the local economy can contribute to an increase in alcohol consumption, prostitution and gambling and change the power structure within families. ***Potential Rights impact***: e.g. right to health and right to security of person	Social vices (alcoholism, drug use, prostitution, gambling) have been identified as a significant problem in the area. Significant in-migration. Increased cash economy. Civil society organisations or other groups have expressed concerns over discrimination against women or gender-based violence	All local stakeholders.
Conflict	The discovery of natural resources can generate local conflict or regional conflict, leading to violence (including sexual violence) and forced migration. Conflict may also be pre-existing and contributed to by extractive operations. ***Potential Rights linkage***: e.g. right to an adequate standard of living, right to life, liberty and personal security.	Current or history of violent conflict between groups in the area.	All local stakeholders.
Environmental degradation	Extractive industry activities can degrade soil quality and contribute to air and water pollution threatening resources upon which people depend for subsistence and threaten biodiversity. ***Potential Rights linkage***: e.g. right to health, right to food.	The area has been identified (e.g. by international or national organisations or academics) as being ecologically fragile or having high ecological value. Several other extractive operations are ongoing in the region leading to cumulative environmental impacts.	Stakeholders relying on resources within area of impact.

Appendix 2

Table of mineral commodities, their properties, functions in electronic devices and mineral ore origins, as well as the largest producing nations in 2014; the largest producer by tonnage is listed first. Mineral commodities listed in red are those commonly related to high-risk and conflict-affected areas (Source: Jameson et al. 2016; USGS n.d.)

Mineral Commodity	**Properties and Use(s) in Electronics Devices**	**Mineral Origin(s)**	**Global producers**
Aluminium	Low density and non-corrosive, used for scratch-resistant surfaces and screens	Bauxite	Australia, China, Guinea
Arsenic	Conductive, used in alloys in semiconductors, radio frequency and power amplifiers	Arsenopyrite	China
Cobalt	Chemically reactive, used in battery cathodes	Cobaltite, Erythrite, Glaucodot, Heterogenite	DRC, Russia, Australia
Copper	Conductor of electricity and heat, used in circuitry	Chalcopyrite	Chile, China, Peru
Gallium	Conductive, used for semiconductors, LEDs, logic chips, and microwave amplifiers	Bauxite	Australia, China, Guinea
Germanium	Conductive, used in battery, display, electronics and circuitry, and vibration components	Sphalerite	China
Gold	Conductive, used for electronic connectors, switch and relay contacts, soldered joints, surface finishes, and wires	Gold	China
Graphite	Electrical and thermal conductor, while resistant to heat and chemical damage, used mainly in battery anodes	Graphite	China, India
Indium	Transparent and conductive, used in liquid crystal displays	Sphalerite	China, South Korea
Lithium	Chemically reactive and has a high performance-to-weight ratio, used in battery cathodes	Amblygonite, Petalite, Lepidolite, Spodumene	Australia, Chile, Argentina, China
Nickel	Conductive, magnetic and resistant to corrosion, often used in alloys for batteries and microphone capsules	Limonite, Garnierite, Pentlandite	Indonesia, Philippines, Canada
Mica	Electrical insulator and thermal conductor, flexible and non-corrosive, used as an insulator and in capacitors	Mica	China, Finland
Platinum-group metals	Conductive, used in circuitry, capacitors, and plating	100+ mineral sources	South Africa, Russia, Canada
Potassium	Strengthens glass, used for screen glass	Langbeinite, Sylvite, Sylvinite	Canada, Russia, Belarus
Rare-earth elements	Magnetic properties and give optical quality to glass, used in LEDs, screens, speakers, and vibration motors	Bastnäsite, Clays, Loparite, Monazite, Xenotime	China
Silica	Gives glass clarity, used for screen glass and semiconductors	Silica sand	China, US
Silicon	Conductive, used for semiconductors	Quartz	China
Silver	Conductive, used for circuitry	Argentite, Tetrahedrite	Mexico, China, Peru
Tantalum	Stores charge, used in capacitors	Columbite - tantalite (coltan)	Rwanda, Brazil, DRC
Tin	Transparent and conducts electricity, used in liquid crystal displays and circuit board solder	Cassiterite	China, Indonesia, Burma, Peru
Tungsten	Very dense and durable, used in wiring, electronic circuit boards, heat sinks, and cell phone vibration mechanisms	Scheelite, Wolframite	China, Indonesia, Burma, Peru

Appendix 3

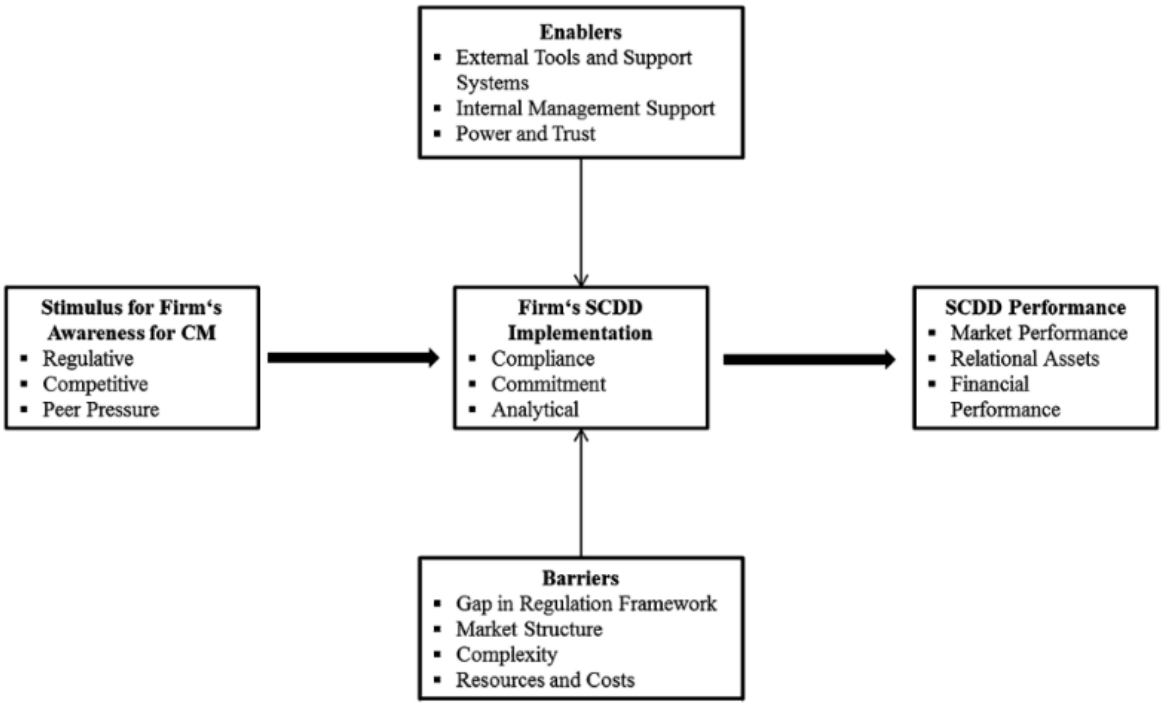
Table listing the global mining disputes by country and intensity of violence, as well as the total number of disputes and the country development level. The disputes are listed by the number of mining-related disputes in categories based on the intensity of violence, from violent conflict (widespread mass mobilization, violence, arrests etc.), non-violent conflict (street protests, visible mobilization), and dispute (local organisation) based on data from Temper *et al* (2015). In addition, the countries where minerals are linked to total war or limited war are listed, based on conflict data from HIIK (2018); limited war refers to war where the state(s) do not expend all resources at their disposal engaged in that conflict, for example as part of a regional internal war. Data on country development sourced from United Nations (2019).

Country	Development	War	War (limited)	Violent Conflict	Non-Violent Conflict	Disputes	Total Disputes
Argentina	Developing			10	18	12	40
Australia	Developed			1	0	0	1
Bolivia	Developing			6	4	4	14
Botswana	Developing			1	0	0	1
Brazil	Developing			9	17	8	34
Burkina Faso	Developing			1	0	2	3
Chile	Developing			4	15	5	24
China	Developing			8	6	3	17
Colombia	Developing		YES	14	21	15	50
Costa Rica	Developing			2	1	1	4
Croatia	Developing			2	0	1	3
Dominican Republic	Developing			1	4	0	5
DRC	Developing		YES	2	0	2	4
Ecuador	Developing			5	6	2	13
El Salvador	Developing			1	0	0	1
Ethiopia	Developing			1	0	0	1
Greece	Developed			1	0	0	1
Guatemala	Developing			7	3	0	10
Honduras	Developing			3	2	1	6
India	Developing			18	12	3	33
Indonesia	Developing			4	3	1	8
Japan	Developed			1	1	0	2
Kenya	Developing			1	1	2	4
Kyrgyzstan	Developing			1	0	0	1
Lebanon	Developing			1	0	0	1
Madagascar	Developing			2	4	0	6
Mexico	Developing			13	11	2	26
Mongolia	Developing			1	0	1	2
Morocco	Developing			2	2	1	5
Myanmar	Developing		YES	3	2	3	8
Nicaragua	Developing			1	1	0	2
Panama	Developing			1	3	0	4
Papua New Guinea	Developing			3	1	2	6
Peru	Developing			21	18	9	48
Philippines	Developing			17	9	0	26
Portugal	Developed			1	1	0	2

Russia	Developed			1	0	2	3
Senegal	Developing			1	1	5	7
Sierra Leone	Developing			1	0	0	1
South Africa	Developing			3	1	6	10
Spain	Developed			1	5	2	8
Sudan	Developing			1	0	0	1
Sweden	Developed			1	2	2	5
Tanzania	Developing			1	0	0	1
Thailand	Developing			1	1	0	2
The Gambia	Developing			2	0	0	2
Tunisia	Developing			1	0	0	1
Turkey	Developed			2	6	4	12
United States	Developed			2	3	3	8
Venezuela	Developing			6	3	4	13
Vietnam	Developing			1	3	3	7
Zimbabwe	Developing			2	3	2	7

Appendix 4

Figure summarizing the implementation of supply chain due diligence for mineral sustainability. Listing the stimuli, barriers and enablers of supply chain due diligence implementation, as well as due diligence implementation measures and performance outcomes. Sourced from Hofmann *et al.* (2015).



Appendix 5

Questions used in the survey which can also be accessed via this link. Questions where developed using the indicators in Table 5 and OECD (2013a) survey on corporate due diligence practices.

	Explanatory factors	Indicators	*Questions*
Effective mineral due diligence	Set clear due diligence policy in line with recognised standards (i.e. Due Diligence Guidance)	1) Appropriate due diligence policy commitment 2) Degree to which corporate policies are accessible 3) Internal/external stakeholder incorporation into policy development 4) Incorporation of mineral due diligence standards/guides	*1) Does your company define a specific policy on minerals?* *2) Is this policy publicly available? Where?* *3) Which guidance/frameworks for responsible mineral sourcing are incorporated into mineral policy?* *4) Which stakeholders are incorporated into policy development? And to what degree?*
	Conduct appropriate stakeholder engagement at key opportunities throughout the due diligence process (see *Table 3*)	1) Number of engagement opportunities used within the OECD due diligence stages (see Table 3 for assessment criteria)	*Management Systems* *1) To which tier of suppliers does your company directly engage with as part of due diligence?* *2) What is your company relationship with suppliers subject to due diligence?* *3) Is responsible mineral sourcing incorporated into supplier contracts?* *4) Do you have plans/corrective action plans in place regarding relationships with suppliers?* *5) Are other stakeholders engaged as part of this?* *6) What are the main engagement challenges and/or good practices your company has encountered within Step 1?* *Identifying/Assessing Risks* *1) How does your company gather data on smelters? Does this involve engaging with external stakeholders?* *2) Have you participated in any capacity building (such as supplier training) efforts with/for identified smelters?* *3) Are external stakeholders involved in this?* *4) Do you have a grievance mechanism available to report problems/violations regarding mineral policy?* *5) Please outline the characteristics of this grievance mechanism.* *6) What are the main engagement challenges and/or good practices your company has encountered within Step 2?* *Risk Management* *1) Are management/remediation plans devised to respond to identified risks?* *2) How do you support (or build leverage over) your suppliers and/or smelters in managing risk identified in the supply chain as a result of their due diligence process?* *3) Do you have processes for ongoing evaluation of due diligence? Do these involve stakeholders?* *4) What are the main engagement challenges and/or good practices your company has encountered within Step 3?*

		<u>Auditing</u> *1) How and by whom are smelter audits conducted?* *2) What are the main engagement challenges and/or good practices your company has encountered within Step 4?* *<u>Reporting</u>* *1) Do you publicly report on due diligence practices?* *2) How is this information reported?* *3) Are stakeholders involved in the reporting process? Which stakeholders?* *6) What are the main engagement challenges and/or good practices your company has encountered within Step 5?*
Set clear engagement policy in line with recognised standards (i.e. Stakeholder Engagement Guidance)	1) Appropriate engagement policy commitment 2) Degree to which corporate policies are accessible 3) Internal/external stakeholder incorporation into policy development 4) Incorporation of stakeholder engagement standards/guides	*1) Does your company define a specific policy on engagement?* *2) Is this policy publicly available? Where?* *3) Which guidance/frameworks for engagement are incorporated into mineral policy?* *4) Which stakeholders are incorporated into policy development? And to what degree?*
Establish clear management responsibilities for engagement	1) Internal allocation of management responsibility for engagement (i.e. engagement team or committee) 2) Internal assignment of accountability for engagement management (i.e. senior staff)	*1) Describe the level and role of senior management that is accountable for stakeholder engagement?* *2) What accountability procedures have you developed for stakeholder engagement?*
Research operating context to identify and analyse stakeholder groups	1) Diversity and quality of sources/tools used to research the supply chain and potential business impacts 2) Criteria used to assess stakeholder groups (i.e. vulnerability)	*1) Has your company established a method for identifying stakeholders?* *2) What tools/sources are used to gather supply chain and stakeholder data?* *3) On which criteria are stakeholder groups assessed?* *4) Do you keep a list of key stakeholders?*
Set appropriate engagement objectives	1) Degree to which objectives are accessible, focused on stakeholder needs, aligned with corporate policy and international standards	*1) How are objectives for individual engagement sessions defined?* *2) What methods do you use to communicate with internal/external stakeholders when setting objectives?*
Ensure stakeholders are informed	1) Timely provision of relevant information with stakeholders before engagement 2) Degree to which shared information is clear, in an accessible format, and accurate	*1) Are stakeholders contacted prior to engagement sessions?* *2) What information is shared with stakeholders before engagement and how is it communicated?*
Provide necessary support for stakeholders to be fairly, equally and respectfully represented	1) Matching appropriate engagement mode to the plan, scope and stakeholder group(s) involved in engagement	*1) Are stakeholders supported as part of the engagement process?* *2) What internal measures exist to facilitate engagement?*

Meaningful stakeholder engagement

Assign appropriate mode of engagement (see *Table 2*)	1) Processes in place to support open and equal stakeholder representation (e.g. financial and logistical support.) 2) Processes in place to ensure cultural sensitivity during the engagement (e.g. internal training, resource allocation.)	*1) How are objectives incorporated into engagement planning?* *2) Does this planning involve collaboration with stakeholders?*
Assign realistic and appropriate engagement timelines	1) Stakeholders are provided with sufficient time and flexibility to plan engagement activities and represent their perspective	*1) How is the length and timing of engagement planned?* *2) Is engagement flexible based on stakeholder needs?*
Establish a transparent remediation process which incorporates stakeholder concerns	1) Reporting of engagement activities and remediation plans back to stakeholders 2) Stakeholder consultation to ensure their concerns are adequately addressed/incorporated into follow-up remediation planning	*1) Are engagement activities recorded and reported back to stakeholders?* *2) Are stakeholders engaged to ensure these responses are adequate?*
Develop ongoing monitoring and evaluation mechanisms incorporating stakeholders	1) Internal processes for monitoring and evaluating engagement 2) Incorporation of stakeholders into ongoing engagement monitoring and evaluation	*1) What procedures does your company have in place to monitor and evaluate stakeholder engagement?* *2) Are stakeholders involved in this?*

Appendix 6

Letter sent to case studies requesting survey participation.

Subject: Requesting XXX participation in a corporate survey on Responsible Mineral Sourcing

Dear Sir/Madam,

I am an employee of the GoodElectronics Network (an NGO based in Amsterdam) and am conducting a research project for Utrecht University on stakeholder engagement and responsible mineral sourcing. As part of this research, I am writing to request that a representative of XXX participate in a short survey.

The survey **takes 10 minutes** and consists of multiple-choice questions to make it as quick and as flexible as possible, although the option to provide longer answers and spend more time on your feedback is available. The ideal participant would be a **manager or member of staff in the sustainability/CSR department** as this survey asks a series of questions on responsible mineral sourcing.

The purpose of this research is to gather data on how electronics companies engage with stakeholders as part of responsible mineral sourcing, e.g. suppliers, smelters, NGOs, governments, as well as workers/communities in mining areas. Data is being collected in a variety of ways, including using publicly available company reports (and other public corporate info), academic reports and industry-level research papers. However, this survey aims to provide expert first-hand data from electronics companies, focusing on the factors which enhance and impede effective stakeholder engagement within mineral sourcing processes.

Any input you can provide in the survey is important and will be used to develop recommendations on stakeholder engagement strategies which maximise sustainability performance among electronics companies. These results will be shared with your company and may provide useful feedback or input regarding stakeholder engagement/mineral sourcing strategy.

To participate, please click the link below or copy the link into your Internet browser:
https://www.surveymonkey.com/r/K3HCW8R

Your participation in the survey is completely voluntary and all your responses will be kept confidential. If you have difficulty using the online survey or would like to participate in a different format, I would be happy to accommodate this. If this is the case or should you have any other comments/questions, please contact me at: rco.evans@gmail.com.

Thank you very much for your time, knowledge and cooperation.

Sincerely,

Richard Evans
External Consultant for The GoodElectronics Network
International office:
Sarphatistraat 30
1018 GL, Amsterdam
Netherlands

Email: rco.evans@gmail.com
Phone: +44 7812 5240

Appendix 7

Electronic MNC Details							Case Study Selection				
Parent Company Name	**Subsidiaries / Brand(s)**	**Industry**	**Value chain**	**Product(s)**	**Market Cap ($US *from Bloomberg)***	**HQ locations**	**OECD Compliant?**	**Public Report?**	**Report Years**	**Mineral Report Years**	**Case Study Selection**
Acer Inc.	Packard Bell	Computer Hardware, Consumer Electronics	Brand Company	PCs, laptop PCs, tablets, smartphones, monitors, TVs (LED, LCD and Plasma), projectors	2,040,000,000	Taiwan	YES	CSR report, website	2005, 2007-2018		YES
Aigo (aka Beijing Huqai Digital Tech Co. Ltd.)		Consumer Electronics		Mobile Internet devices, digital storage (USB keys and hard drives), portable media players, cell phones, digital cameras	N/a	China	NO	NO	-		NO
Aiptek Inc.		Consumer Electronics		Projectors, camcorders, tablets	11,270,000	Taiwan	NO	NO	-		NO
Akai Electric Co. Ltd.		Electronics, Consumer Electronics		Televisions, DVD players/recorders, VCRs, speaker systems, MP3 players, mobile phones	N/a	Japan	NO	NO	-		NO
Alphabet Inc.	Google LLC	Computer Hardware, Consumer Electronics	Retailer, Brand Company	Laptops, Smart home devices, wearable tech, smartphones, tablets	834,590,000,000	US	YES	CSR report, website, mineral report	2013-2018	2013-2018	YES
Amazon.com Inc.	Lab126, Ring	Computer Hardware, Consumer Electronics	Brand Company	Media players, Smart home devices	873,110,000,000	US	NO	NO	-		NO
Apple Inc.		Computer Hardware, Consumer Electronics	Brand Company	PCs, laptops, media players, home entertainment, wearable tech, smartphones	881,240,000,000	US	YES	CSR report, website, mineral report	2007-2018	2013-2018	YES
Archos		Consumer Electronics		Portable media players, tablet computers, hard disks, PDAs, Smartphones	19,360,000	France	NO	NO	-		NO
Arise India Ltd.		Consumer Electronics		Televisions	N/a	India	NO	NO	-		NO
ASUSTeK Computer Inc.	Asus Vivo	Consumer Electronics	Brand Company	Laptops, Netbooks, Desktop PCs, smartwatches, smartphones, tablets	5,460,000,000	Taiwan	YES, via RBA	CSR report, website	2007-2018		YES
ATandT Inc.		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	222,690,000,000	US	NO	NO			NO
BBK Electronics Corporation	Realme, OPPO, Vivo, OnePlus	Consumer Electronics	Brand Company, OEM	TVs, media players, digital cameras and smartphones	N/a	China	NO	NO	-		NO
Binatone Electronics International Ltd.	AEG, iDECT, Voxtel, Voxtel, Hubble, Motorola Mobility	Household Electronics, Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, home phones, tablets, media players	N/a	China	NO	NO	-		NO
BLU Products Ltd.		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	230,000,000	US	NO	NO	-		NO
BOSE Corporation		Consumer Electronics	Retailer, Brand Company	Audio systems, headphones, HD TVs, home entertainment	N/a	US	NO	CSR report, website	2016-2018		NO
BT Group	EE	Telecommunications, Consumer Electronics	Retailer, Brand Company	Set-top boxes, mobile phones	29,960,000,000	UK	YES, via RBA	CSR report, website, mineral report	2001-2018	2018-2013	YES

Canon Inc.		Consumer Electronics	Brand Company	Cameras, camcorders, printers/copiers, projectors	38,330,000,000	Japan	YES	CSR report, website, mineral report	2003-2018	2013-2018	YES
Ceconomy AG	Media Markt, Satrun (retail brands: PEAQ, ISY, KOENIC)	Household Electronics, Telecommunications, Consumer Electronics	Retailer, Brand Company	Computers, tablets, laptops, monitors, speakers, TVs, mobile phones	1,790,000,000	Germany	NO	CSR report, website	2017-2018		NO
Celkon		Telecommunications, Consumer Electronics	Brand Company, OEM	Mobile phones, smartphones, tablets	N/a	India	NO	NO	-		NO
Chicony Electronics Co., Ltd		Computer Hardware, Consumer Electronics	Brand Company, OEM	Cameras, camcorders, computer accessories	1,670,000,000	Taiwan	NO	CSR report, website	2012-2018		NO
Comcast Corporation	Sky Ltd., XFINITY, NBCUniversal	Telecommunications, Consumer Electronics	Brand Company	Set-top boxes, home phones	180,040,000,000	US	NO	CSR report, website	2012-2018		NO
DataWind Inc.		Consumer Electronics		Smartphones, tablets, notebooks	328,950	Canada	NO	NO	-		NO
Dell Technologies Inc.	Dell, Alienware	Consumer Electronics	Retailer, Brand Company	Computers, smartphones, Televisions	43,000,000,000	US	YES	CSR report, website, mineral report	2018	2018	YES
Deutsche Telekom AG		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	85,350,000,000	Germany	YES	CSR report, website	2008-2018		YES
Dixons Carphone plc	Currys PC world, Carphone Warehouse, Elkop, Elgiganten and Kotsovolos (retail brands: Logik, Advent, Goji, Sandstrom)	Household Electronics, Telecommunications, Consumer Electronics	Retailer, Brand Company	Televisions, monitors, media players/recorders, computers, smartphones	2,210,000,000	UK	NO	NO	-		NO
Emerson Electric Co.		Electronics, Consumer Electronics	Brand Company	Televisions, VCRs, DVD players, radios	42,050,000,000	US	YES	CSR report, website, mineral report	2015-2018	2013-2018	YES
Fairphone		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones	N/a	Netherlands	YES	CSR report, website	2013-2018		NO
Foxconn Technology Co. Ltd. (Hon Hai Precision Co. Ltd.)	Sharp Corporation, Aquos, Smart Technologies, FIH Mobile	Household Electronics, Telecommunications, Consumer Electronics	Brand Company, OEM	Mobile phones, audio-visual entertainment equipment, projectors, monitors scanners/printers, televisions	2,910,000,000	Taiwan	YES	CSR report, website	2009-2018		NO
Fujitsu Ltd.		Computer Hardware, Telecommunications, Consumer Electronics	Brand Company, OEM	Mobile phones, notebooks, tablets	15,000,000,000	Japan	YES	CSR report, website	2012-2018		YES
Funai Electric Co. Ltd.		Consumer Electronics		Televisions, video recorders/players, printers	230,000,000	Japan	YES	CSR report, website	2015-2016		NO
Haier Electronics Group Co. Ltd.		Electronics, Consumer Electronics		Smartphones, computers, televisions	8,480,000,000	China	NO	CSR report, website	2016-2018		NO
Harvard International Ltd.	Goodmans Industries	Consumer Electronics	Brand Company	Audio systems, set-top boxes	N/a	UK	NO	NO	-		NO

Hisense Home Appliances Group Co. Ltd.	Hisense Electric, Toshiba Visual Solutions, Ronshen, Kelon, Groenje, Savor, Sharp	Electronics, Household Electronics, Consumer Electronics	Brand Company, OEM	Mobile phones, smartphones, televisions.	2,380,000,000	China	NO	NO	-		NO
Hitachi Ltd.	Hitachi Electronics	Conglomerate	Brand Company	Televisions, projectors, camcorders, media recorders/players	32,000,000,000	Japan	YES	CSR report, website	2005-2018		**YES**
HP Inc.		Computer Hardware, Consumer Electronics	Brand Company	Desktops, Laptops, printers	30,510,000,000	US	YES	CSR report, website, mineral report	2002-2018	2018-2013	**YES**
HTC Corp.	Saffron Digital, Vive	Telecommunications, Consumer Electronics	Brand Company	Smartphones, Tablets, Laptops	980,000,000	Taiwan	YES, via RBA	CSR report	2017		**YES**
Huawei	Honor	Telecommunications, Consumer Electronics	Brand Company	Smartphones, tablets, wearable tech, laptops	N/a	China	YES	CSR report, website	2008-2018		**YES**
Humax Co. Ltd.		Consumer Electronics	Brand Company, OEM	Media players/recorders	150,000,000	South Korea	YES, via RBA	CSR report, website	2016		**NO**
Intex Technologies		Electronics, Consumer Electronics		Mobile phones, smartphones, TVs, audio equipment	N/a	India	NO	NO	-		NO
J Sainsbury plc	Sainsburys, Argos (retail brands: Bush, Alba)	Electronics, Consumer Electronics	Retailer, Brand Company	Televisions, stereos, radios, speakers, DVD players, camcorders, media players, smartphones, tablets	6,810,000,000	UK	NO	CSR report, website	2008-2014, 2017-2018		NO
JVCKenwood Corp.	JVC, Kenwood, Victor	Electronics, Consumer Electronics	Brand Company	Televisions, camcorders, audio systems	390,180,000	Japan	NO	CSR report, website	2009-2018		NO
Koninklijke Philips NV	Philips Electric	Conglomerate	Brand Company	Televisions, projectors, monitors, media players/recorders, home phones, Recorders, Radios, HiFi, audio systems, headphones	37,770,000,000	Netherlands	YES	CSR report, website, mineral report	2018	2018-2013	**YES**
Kyocera Corp.		Consumer Electronics	Brand Company	Printers/copiers, mobile phones, smartphones	21,620,000,000	Japan	NO	NO	-		NO
Kyoto Electronics		Consumer Electronics		Tablets, mobile phones, smartphones, DVD drives, audio players/systems	N/a	Mexico	NO	NO	-		NO
Lanix		Consumer Electronics		Smartphones, Laptops, Tablets, Computers	N/a	Mexico	NO	NO	-		NO
Lenovo Group Ltd.	Medion, Motorola Mobility LLC	Telecommunications, Consumer Electronics	Brand Company	PCs, tablet computers, smartphones, televisions, wearable tech, printers/scanners	10,720,000,000	US	YES	CSR report, website	2009-2018		**YES**
LG Electronics Inc	LG Display, Zenith Electronics LLC.	Conglomerate	Brand Company	Televisions, smartphones, mobile phones, tablets, smartwatches	460,000,000	South Korea	YES	CSR report, website, mineral report	2005-2018	2018-2013	**YES**
Meebox		Consumer Electronics		Computers, tablets, laptops, monitors, speakers, headphones	N/a	Mexico	NO	NO	-		NO
Meizo Technology Co. Ltd.		Consumer Electronics		Smartphones, media players	N/a	China	NO	NO	-		NO

Micromax		Telecommunications, Consumer Electronics		Smartphones, tablet computers, LED TVs, Laptops	N/a	India	NO	NO	-		NO
Microsoft Corp.	Microsoft Surface, Microsoft Windows/Office, Xbox, Zune	Computer Hardware, Telecommunications, Consumer Electronics	Brand Company	PCs, Laptops, Tablets, Mobile phones, smartphones, Games Consoles	901,330,000,000	US	YES	CSR report, website, mineral report	2003-2018	2013-2018	**YES**
Micro-Star International Co. Ltd.		Computer Hardware, Consumer Electronics	Brand Company	PCs, laptops, cameras	2,280,000,000	Taiwan	YES	CSR report, website	2015-2018		**YES**
Mitsubishi Corp.	Mitsubishi Electric, Nikon Corporation	Conglomerate	Brand Company	Cameras, camcorders, TVs, Projectors	4,630,000,000	Japan	YES, via RBA	CSR report, website	2007-2018		**YES**
Motorola Solutions Inc.	Moto	Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	22,810,000,000	US	YES	CSR report, website, mineral report	2016-2018	2014, 2016-2018	**YES**
Nintendo Co. Ltd.		Consumer Electronics	Brand Company	Games consoles	38,560,000,000	Japan	YES	CSR report, website	2012-2018		**YES**
Nokia Corporation	Acatel Mobile	Telecommunications	Brand Company	Smartphones, mobile phones	235,280,000,000	Finland	YES	CSR report, website, mineral report	2003-2018	2013,2014, 2016-2018	**YES**
Nvidia Corporation		Computer Hardware, Consumer Electronics	Brand Company	Games consoles, media players	106,480,000,000	US	YES	CSR report, website, mineral report	2016-2018	2013-2018	**YES**
Onida		Household Electronics, Consumer Electronics	Brand Company	TVs (LED, LCD and Plasma), monitors, DVD players/recorders, mobile phones, smartphones	N/a	India	NO	NO	-		NO
Panasonic Corporation	National, Panasonic, Sanyo Electric Co. Ltd., Technics	Conglomerate	Brand Company	Smartphones, mobile phones, televisions, personal computers, audio systems, headphones, projectors	20,990,000,000	Japan	YES	CSR report, website	2003-2018		**YES**
Pegatron Corporation	Unihan Corporation, ASRock Inc.	Computer Hardware, Consumer Electronics	Brand Company, OEM	PCs, audio systems, laptops, games consoles, TVs, smartphones, set-top boxes	4,420,000,000	Taiwan	YES	CSR report, website	2008-2018		NO
Pioneer Corporation		Vehicle Electronics, Consumer Electronics	Brand Company, OEM	Televisions (LED, CRT and Plasma,), DVD players/recorders, set-top boxes, Monitors	1,130,000,000	Japan	NO	CSR report	2009-2018		NO
Positivo Technologia SA	Positivo Tecnologia SA	Computer Hardware, Consumer Electronics	Brand Company, OEM	PCs, mobile phones, smartphones, set-top boxes	54,000,000	Brazil	YES	CSR report, website	2012-2015, 2018		NO
Qisda Corporation	BenQ, BenQ mobile	Consumer Electronics	Brand Company, OEM	LCD monitors, digital projectors, digital cameras, and smartphones	1,320,000,000	Taiwan	YES, via RBA	CSR report, website	2005-2017		**YES**
Reliance Industries Ltd.	LYF, Reconnect (retailed by Reliance Digital and Jio)	Conglomerate		Smartphones, mobile phones	1,300,000,000	India	NO	NO	-		NO
Samsung Electronics Co. Ltd.	Samsung Electronics Co. Ltd., Samsung Telecommunications	Conglomerate	Brand Company, OEM	Televisions (LED, LCD), smartphones, mobile phones, cameras, media players, laptops	302,270,000,000	South Korea	YES	CSR report, website	2008-2018		**YES**
Sceptre International		Consumer Electronics	Brand Company	TVs (LED, LCD), laptops, monitors, cameras, audio systems	N/a	US	NO	NO	-		NO

SK Telecom Co. Ltd.	AskellandKern, iriver	Telecommunications, Consumer Electronics	Brand Company	Media players, speakers, headphones	1,800,000,000	South Korea	YES	CSR report, website, mineral report	2005, 2007-2018	2018-2013	YES
Skyworth Digital Holdings Ltd.	Shenzhen Skyworth Digital Technology Co Ltd, Shenzhen Skyworth-RGB Electronic Co Ltd, Skyworth Mobile Communication Ltd	Consumer Electronics	Brand Company, OEM	Set-top boxes, TVs, audio systems, mobile phones	1,100,000,000	China	NO	NO	-		NO
SONY	Sony Mobile Communications Inc., Sony Interactive Entertainment, Sony Corporation, RCA Corporation	Conglomerate	Brand Company	Portable media players, mobile phones, smartphones, cameras/camcorders, TVs (LCD), monitors, DVD players/recorders, games consoles	54,990,000,000	Japan	YES	CSR report, website, mineral report	2003-2018	2013-2018	YES
Sound United	Denon, Polk, Marantz, Definitive Technology, Hoes, Boston Acoustics	Consumer Electronics	Brand Company	Radios, speaker systems, HiFi, Headphones	N/a	Japan	NO	NO	-		NO
TCL Corporation	TCL Multimedia, TCL Display, Tonly Electronics, BlackBerry Mobile, Alcatel Mobile, Palm	Household Electronics, Telecommunications, Consumer Electronics	Brand Company, OEM	TVs, DVD players, mobile phones, tablets	7,740,000,000	China	YES	CSR report, website, mineral report	2015-2018	2018-2013	YES
Telefonica	Movistar, O2, Vivo	Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	45,830,000,000	Spain	YES	CSR report, website	2008-2017		YES
Thakral Corporation Ltd.	Orion Electronics Ltd.	Household Electronics, Consumer Electronics	Brand Company, OEM	TVS (LCD, Plasma, CRT), DVD players/recorders, monitors, media players	47,130,000	Singapore	NO	CSR report	2010 -2018		NO
Toshiba Corporation	REGZA	Conglomerate	Brand Company, OEM	TVs (LCD and LED), DVD/Blu-ray players, smartphones, Laptops	18,820,000,000	Japan	YES	CSR report, website	2004-2018		YES
Venturer Electronics Inc.		Computer Hardware, Telecommunications, Consumer Electronics	Brand Company	Mobile phones, smartphones, PCs, Tablets, Media players	N/a	China	NO	NO	-		NO
Verizon Communications		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	237,900,000,000	US	YES	CSR report, website, mineral report	2004-2018	2014-2018	YES
Vizio Inc.		Consumer Electronics	Brand Company	TVs, Tablets, Mobile phones, smartphones, laptops, media players	N/a	US	NO	NO	-		NO
Vodaphone Group plc		Telecommunications, Consumer Electronics	Retailer, Brand Company	Mobile phones, smartphones, media players	52,510,000,000	UK	YES	CSR report, website, mineral report	2000-2018	2013-2018	YES
Xerox Corporation		Consumer Electronics	Brand Company	Scanners/printers	7,350,000,000	US	YES	CSR report, website, mineral report	2010-2018	2018-2013	YES
Xiaomi Corporation		Consumer Electronics	Brand Company	Mobile phones, Smartphones, Tablets, Smart home devices, Laptops, Smart TV	35,480,000,000	China	NO	NO	-		NO

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