The European Union Conflict Minerals Regulation

Company and governance strategies in Amsterdam

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Summary

This report is made as a master thesis for the master Metropolitan Analysis, Design and Engineering (MADE). In this thesis the following main question will be answered: How can companies and governance implement the European conflict minerals regulation 2017/821?

The European Union conflict minerals regulation (EU CMR) is introduced because of the link between consumer products and the social, economic and environmental consequences in developing countries. The aim of this thesis is to investigate the awareness of the challenges of EU regulation on conflict minerals and to find an approach to address them. This research uses the quadruple helix as a theoretical framework to understand the connection between governance, industry, academia and civil society. EU CMR for consumer electronics is important in an smarter world with smart cities in order to make the world more sustainable. This is the relevance of this thesis with my master MADE.

A case study has been conducted for three downstream consumer companies to understand how they are dealing with the upcoming EU CMR. Open online data has been collected, interviews were done with multiple companies and the companies were rated via the Responsible Sourcing Network (RSN)grid. Fairphone scores the label leading with a score of 86 out of 100, the statements reflect a good understanding of conflict minerals and the road towards responsible sourcing. Tesla scores barely sufficient with a score of 51 out of 100 which means that there is a lot of improvement possible. Tesla does not focus on conflict minerals while they are working to responsibly source cobalt and check smelters of cobalt, which they do not need to do for 3TG. Philips scores the strong label with a score of 77 out of 100. The interview with the Philips representative reflects a good understanding of conflict minerals and company goals towards sustainability. In conclusion two of the three companies did quite well, while one company was only adequate. In order to be able to understand the larger picture, six experts from governance, civil society and academia, are interviewed to investigate how they can contribute to solving this problem of sustainable sourcing and to understand where the responsibility lies. The outcomes of the case study and expert interviews are gathered in the quadruple helix relation-based structure. Figure 1 illustrates the influence of all sectors with each other. Civil society exerts pressure on and contributes to governance. Civil society provides help and tools for industry and at the same time puts pressure on industry. The relationship between civil society and academia is shallower; civil society can provide input to research and academia can provide clarity to civil society. Academia can provide clarification to industry and advice for governance. Governance creates policy and guidance for industry and industry provides reporting and compliance to government from its enforcement agencies.

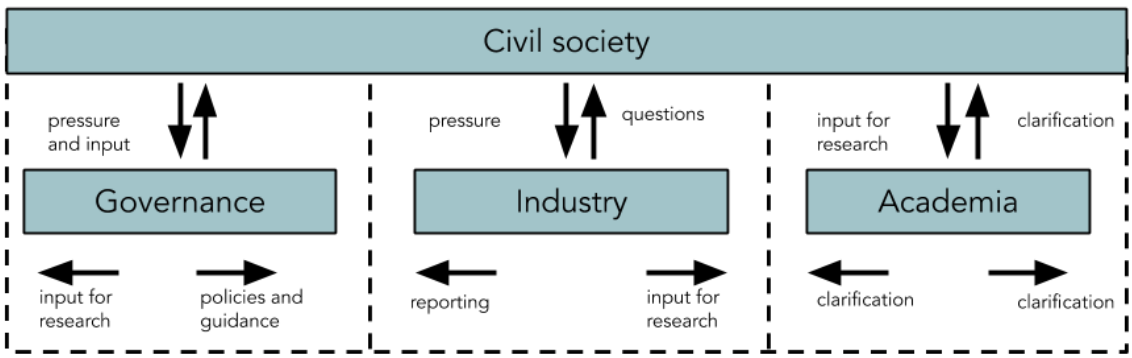

Figure 1: Outcomes of relations between the sectors

The outcomes of this study is stated in five conclusions:

· There is an imbalance between Responsible Sourcing (RS) and EU CMR
· There is a lack of awareness about the EU CMR for companies
· There is a lack of transparency in the supply chain of electronic producing companies
· There is a desire for more cooperation between stakeholders
· There is uncertainty for organisations about the responsibility of EU CMR

Besides the answers to the research question an important observation is the gap between EU CMR, Circular Economy (CE) and Sustainable Development Goals (SDGs). EU CMR only focuses on the social and economic sides of the problem while there is also the environmental side which could be tackled in a similar way using transparency in the supply chain.

To generate a stepping stone for future development, recommendations have been created per sector shown in figure 2. The recommendations can be considered as a start point to connect the EU CMR with the future of a CE and the SDG. Recommendations for the governance sector consist of: more collaboration, research the impact of regulation, include more minerals, production companies need to have more responsibilities, more transparency of customs information, connection with SDGs and connection with CE to be established. Recommendations for the Industry sector consist of: more multi-stakeholder collaboration, more transparency, more sustainability reporting, more responsibility, implement CE instead of new minerals, be a frontrunner. For the academia sector recommendations consist of: collaboration, fill the gap between CE, SDGs and EU CMR, research SDGs and EU CMR, research CE and EU CMR. Recommendation for the civil society sector consist of: more pressure on governance and industry, collaboration, feedback after shaming industry, research impact of regulation.

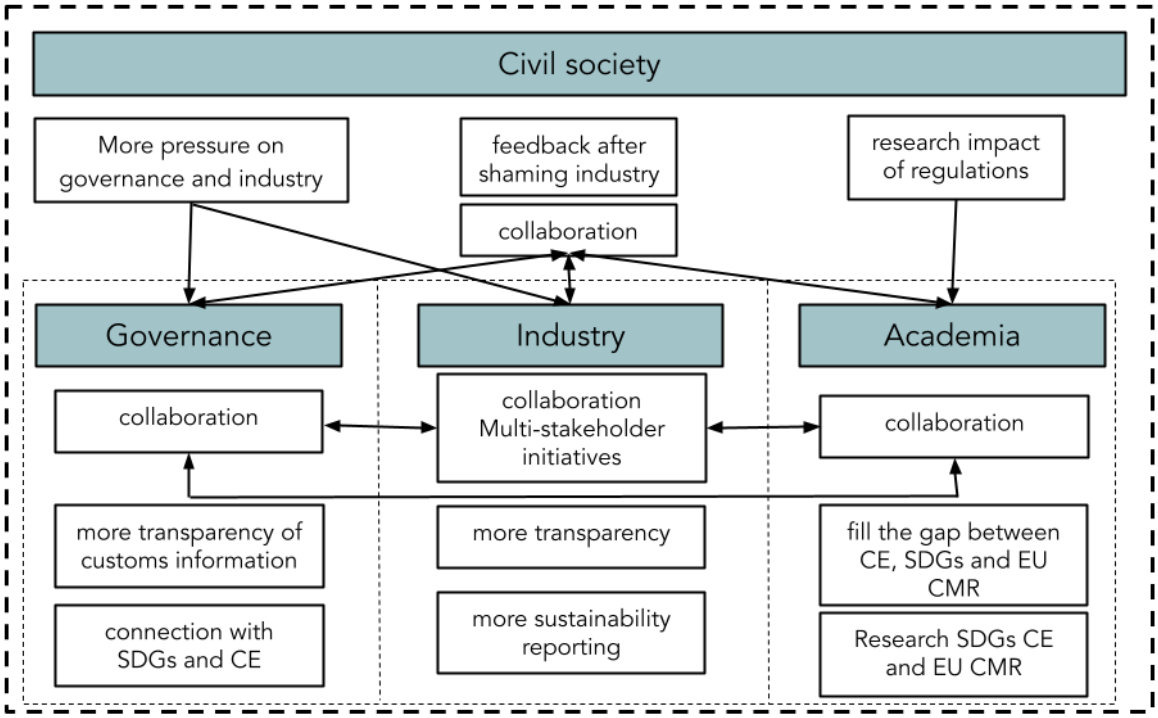

Figure 2: Recommendations

Contents

Abbreviations

EU CMR	European Conflict Minerals Regulation 2017/821
CM	Conflict Minerals
CSR	Corporate Social Responsibility
KPI	Key Performance Indicators
MADE	Metropolitan Analysis, Design and Engineering
OECD	Organisation for Economic Co-operation and Development
RSN	Responsible Sourcing Network
RS	Responsible Sourcing
SEC	Securities and Exchange Commission
SOR's	Smelters or Refiners
3TG	Tin, Tantalum, Tungsten, Gold

1.0 Introduction

In this chapter the introduction of the thesis is given, starting with the introduction about responsible sourcing and conflict minerals in chapter 1.1. The relevance of this thesis is explained in chapter 1.2. The research questions are presented in chapter 1.3. The research structure is described in chapter 1.4 and lastly the outline of this thesis is described in chapter 1.5.

1.1 Responsible sourcing and conflict minerals

Currently, responsible sourcing in the mining industry is attracting attention from consumers, policy-makers and investors who want to know the origin of materials. Responsible sourcing of the supply chain includes the management of social, environmental and/or economic components (Van den Brink et al., 2019). However, supply chains of minerals have many steps from miner to end of product use. This makes it difficult, but not impossible, to accomplish transparency of the supply chain (Young et al., 2019). The transparency is essential to ensure that the mined minerals do not support conflict, illegal trade and or human rights violation, which can thus be called conflict-free minerals (Hofmann et al., 2018). This transparency is also a requirement to take steps in the direction of circular supply chains (Iacovidou et al., 2017).

Conflict minerals are minerals that are mined in politically unstable countries that use profits from the mining of these minerals to finance armed conflicts and/or violate human rights. The minerals which are linked to this kind of practice are the derivatives from tin, tantalum, tungsten and gold, abbreviated as 3TG (European commission, 2019). These minerals are used in many high value products, including electronic products, and are therefore of high economic value.

The United States has a legal act, the Dodd-Frank act 1502, that discourages organisations from using conflict minerals in their production process. Inspired by the Dodd Frank act 1502 The EU developed their own conflict minerals regulation, which has entered into force in January 2021. This regulation only applies to importers with more than 500 employees, since this regulation could make smaller companies incur expenses that are possibly too large to bear. European importers of 3TG have to follow the guidelines made by the Organisation for Economic Co-operation and Development (OECD); these guidelines are recognised by the European Commission.

In these guidelines the definition for conflict affected and high risk areas is given as:
"*Conflict-affected and high-risk areas are identified by the presence of armed conflict, widespread violence or other risks of harm to people. Armed conflict may take a variety of forms, such as a conflict of international or non-international character, which may involve two or more states, or may consist of wars of liberation, or insurgencies, civil wars, etc. High-risk areas may include 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, 2016, p. 66)

1.2 Problem statement

Attention for conflict minerals is growing because of the link between consumer products and impacts in developing countries socially, environmentally and economically. Social impacts include human rights abuses, child labour, forced labour, conflict, harmful working conditions and violation. The environmental impact of the mining industry is enormous, and consist of among others, water and soil pollution, which in turn contribute to the destruction of vital ecosystems. Lastly, in terms of the economic impacts, in mining regions, most inhabitants rely on the work in the mine even when they do not get paid sufficiently for sustenance. Further, if the mine is relocated they do not have income from other work because almost everyone in the community is working in the mine. This thesis is relevant because of the social, environmental and economic problems consumer electronics produce. Nobody wants to know they have bought a phone which is produced by children, and that the minerals in it are mined by even younger children. People tend to close their eyes for this type of problems, but for meeting the sustainable development goals (SDGs) a substantial increase in awareness and taking of responsibility is required for the detrimental effects of producing the electronics of the global north. Not only consumers, but also the companies, have to be responsible and regulation can help companies to act according to this necessity.

Many global north countries actively promote smart cities, while at the same time over consuming, which comes at the expense of countries in the global south. Change is needed and there is a complex array of pathways available to address this challenge. The EU CMR could be a step in the direction towards a more comprehensive shift to responsible sourcing. The sustainable development goals and the circular economy principal can relieve pressure from the mining communities by investment in improvement for the local community with schools and give people change of different work.

1.3 Research questions

1.3.1 Main research question

How can companies and governance implement the European conflict minerals regulation 2017/821?

1.3.2 Sub questions

1. **How does the European conflict minerals regulation 2017/821 relate to responsible sourcing?**
2. **What level of company awareness and transparency is present with regard to the European conflict minerals regulation 2017/821?**
3. **Which stakeholders and guidance can support organisations to comply with the European conflict minerals regulation 2017/821?**

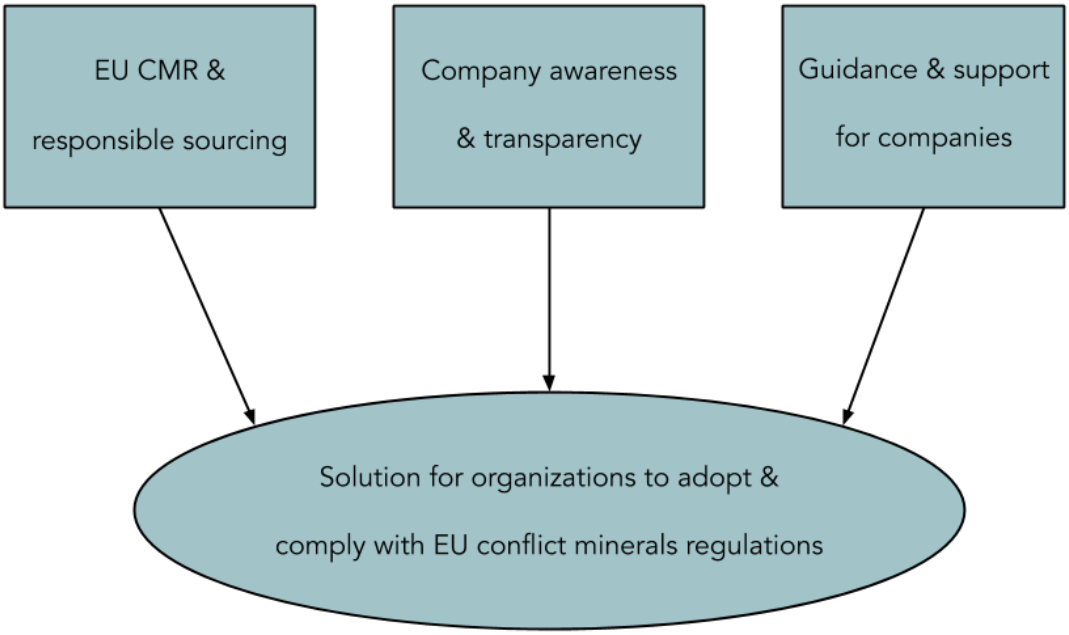

Figure 3: Research questions

1.4 Outline thesis

The outline of this thesis is constructed as follows; it starts with an introduction to the topic of conflict minerals. This is followed by the literature background that is used in this research and which is gathered and structured in a table using the Wolfswinkel method (2013) (Appendix B). The next chapter starts with the theoretical framework of the quadruple helix model; this model is used as a way to connect all different stakeholders from the four sectors: academic, governance, industry and civil society. In the same chapter the mixed method methodology is explained, which consist of a case study using a rating method from the RSN to grade the different Amsterdam based companies. Also, the semi-structured interviews and the coding structure are addressed in this chapter. The results are structured for the case study per company and compared in the last paragraph. The results from the stakeholder interview are combined in the beginning of the paragraph and consider further on in greater detail. In the discussion, the theory, methods and limitations of the research are reviewed, and linked to the expectations, limitations and possible implications of the research. The results and scientific contribution are discussed. Lastly, the conclusion gives answers to the research question and dives into the deeper meaning and observations of the gap between sustainability and conflict minerals.

2.0 Literature background

This chapter gives an explanation of a literature review about corporate social responsibility, responsible sourcing and sustainable supply chain management. Further, the literature background will give a background on support and control of conflict minerals. The purpose of this section is to clarify concepts that concern conflict minerals, using literature about corporate social responsibility (CSR) and responsible sourcing (RS), sustainable supply chain management (SSCM), policy documents and reports about the governance and support of conflict minerals, and thereby lay the basis for the subsequent analysis.

2.1 General background

The importance and liability of a 'fair supply chain' is embedded in the fields of corporate social responsibility (CSR), responsible sourcing (RS) and sustainable supply chain management (SSCM). This section explains these three concepts in more detail and how they relate to the EU CMR. Lastly, the application of SDGs and CE in connection with EU CMR are discussed.

2.1.1 Corporate Social Responsibility

Corporate Social Responsibility (CSR) describes an accountability principle of the behaviour of companies towards society (Schnepp and Bowen,1954). The CSR terminology started with the book: Social Responsibilities of the Businessman written by Howard R. Bowen's and published in 1953. CRS is considered as a tool for management decision-making and strategic planning. Managers with social competences who can see the effects of a business on society are key to sufficient social responsibility (Davis, 1967). CSR was re-invigorated during the financial crisis because of the focus on the behaviour of companies (Schnepp and Bowen,1954). CSR is embedded in the EU strategy for responsible entrepreneurship and includes social, environmental, ethical, customer and human rights. This is a voluntary regulation (European Commission, 2011). The importance of CSR is the impact on society caused by actions of companies, not only by their services and products, but also through employment creation, working conditions, health, human rights and the environment (European Commission, 2019). The EU strategy for CSR is a broader strategy to support the execution of the Sustainable Development United Nations 2030 Agenda, which is linked to the Sustainable Development Goals (SDGs) (European Commission, 2019). CSR is a broad concept and is therefore difficult to map, measure and govern, but nonetheless quite important for society. Disregarding its complexity, it is therefore included in the EU strategy, which stimulates to act on CSR (Hofmann et al., 2018). Intrinsic motivation is a principal driver for CSR, small and medium sized companies make the best effort to be socially and environmentally responsible if they themselves are fully behind it and do it voluntarily (Baden, 2016).

2.1.2 Responsible sourcing

Responsible sourcing is increasingly expected from companies involved in raw material supply chains, using due diligence guidance and standards. (Young et al., 2019). Responsible sourcing (RS) is an umbrella term used for social, environmental and economic aspects of sourcing, and thereby connects these aspects of the 'Triple bottom line' (Glas et al., 2012) RS is a widely used term but does not always imply the same meaning, since there has been no single definition for some time. Van den Brink et al.(2019 p. 391) defines RS as 'the management of social, environmental and/or economic sustainability in the supply chain through production data'. Van den Brink et al.(2019) targets the management of the three aspects through production data of the supply chain as visualised in figure 4. Thereby RS can be measured by comparing the production data, which facilitate the introduction of measures to source more responsibly.

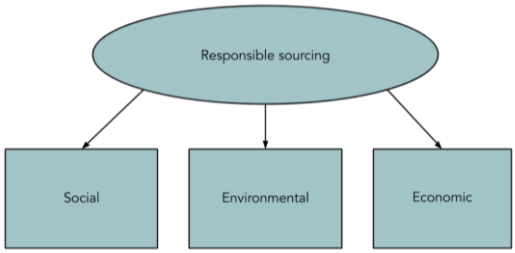

Figure 4: Responsible Sourcing (RS)

2.1.3 Sustainable supply chain management

In this paragraph a short introduction in sustainable supply chain management (SSCM) is given. In SSCM all three pilers of the triple bottom line are included, environmental, social and economic (Carter and Roger, 2008). Further, SSCM focuses on all the steps of the supply chain. SSCM originates from management research in the social science (Seuring and Muller 2008). In SSCM the social aspect is underexposed, since the focus lies predominantly on labour concerns rather than on serious human right issues as for example in conflict minerals in the DRC (Young, 2018).

Ansari and Kant (2017) made a list of enablers and barriers for the implementation of SSCM in the supply chain with a review of literature of the last 15 years. The most accepted possibilities to implement SSCM in supply chains are: cooperation, engagement of management and government regulation. (Ansari & Kant, 2017). The most common obstacles to the implementation of SSCM in the supply chain are: lack of expertise and training, cost complexity, lack of supplier involvement and shortcoming of responsibility from top management (Ansari & Kant, 2017).

2.1.4 UN Sustainable development goals

Figure 5: SDGs for conflict minerals (UN, 2019)

The larger goal of the United Nation is to address at the overall sustainability with the Sustainable Development Goals, which can be linked to the EU regulation. Responsible mineral sourcing contributes to the SDG (GRI, 2019). There are three related SDGs related to the EU CMR, which are: Decent work and economic growth (SDG 8), responsible consumption and production (SDG 12) and peace, justice and strong institutions (SDG16).The Global Reporting Initiative (GRI, 2019) conforms the three applicable SDGs to the EU CMR and visible in figure 5. The SDG 'sustainable cities and communities' is not mentioned as important concerning this regulation. However, the EU CMR and the OECD mention the need for strong community building for sustainable communities (European Parliament, 2020). There are no strict direct regulation for the achievement of the SDGs, it is a broad overall goal. However, indicators are in place to monitor the progress towards these goals. The UN publishes a yearly update concerning these indicators. All the goal targets and indicators of the three SDGs are listed in Appendix A. The most connecting goal (12.6) and indicator (12.6.1) is described below.

"12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.6.1 Number of companies publishing sustainability reports" (UN, 2020)

2.1.5 Circular Economy

The idea of circular economy (CE) is gaining attention from academic, governance and industry. (Gregson et al., 2015). CE consist of a system in which waste is a resource for new products. The required systems are not ready yet and also the government is not a supporter of this new model. Currently, most material is trapped in products and can only be released into the CE system at the end of the product phase (Saleem et al.,2017). Even though CE of 3TG minerals falls outside the scale of the EU CMR today, including a CE approach could be an opportunity for supplying security, while no human rights harm or environmental damage is sustained.

2.2 Supply chain due diligence guidance and regulation

The start of the movement about supply chain due diligence corresponds to the SCR philosophy, which states that companies are responsible for the impact they have on society, along the whole supply chain and environment (Global witness, 2017). There are three types of support mechanisms concerning due diligence of conflict minerals: Dodd-Frank Act 1502, OECD due diligence guidance and conflict minerals regulation 2017/821. This chapter explains the different types of guidance and regulation concerning conflict minerals in chronological order of origin. Staring with the origin of the regulation or guidance following with the impact of the regulation. The EU CMR is covered in more detail with the review clause of the regulation, the definition of responsible sourcing and supply chain due diligence.

2.2.1 Dodd-Frank Act section1502

The United States was the first country to enact law concerning conflict minerals, in 2010 the Dodd-Frank act section 1502 was passed by the U.S. Congress. The Dodd-Frank act requires U.S. publicly-listed companies to check their supply chain for conflict minerals which may originate from the

Democratic Republic of Congo (DRC) and surrounding countries. The legislation is enacted because of the trade and exploitation concerns of conflict minerals that could help to finance armed groups, human rights abuse and increase of conflict in the DRC region. The publicly-listed companies have to address any risks they find and report yearly to the U.S. Securities and Exchange Commission (SEC) (SEC, 2012). The revised rules include that descriptions of products, which are not proven to be DRC conflict-free, need to be included in the report with the country of origin of the conflict minerals and the smelter and manufacturer of the product. The SEC report needs to be publicly available on the website of the producer company (SEC, 2012).

2.2.2 OECD Due Diligence Guidance

The organisation for economic co-operation and development (OECD) translated the UN guiding principles of Business and Human Rights into the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. This guidance was developed through a multi-stakeholder process in which government, industry and civil society were consulted. The goal of the guidance is to respect and honour human rights and prevent companies from contributing to conflicts through their mineral resources. In addition, the guidance promotes transparent mineral supply chains, sustainable business involvement and SCR in the minerals sector. This way, countries can benefit from their mineral resources and prevent mineral extraction and trade from becoming a source of conflict, human rights violations and insecurity. The Due Diligence Guidance is a functional and constructive approach to tackle complex challenges. This guidance addresses organisations potentially sourcing minerals or metals from conflict-affected and high-risk areas and applies to all minerals supply chains. The Due Diligence Guidance is adopted by the Dodd Frank act 1502 and the new EU CMR (OECD,2016). Due Diligence Guidance is a strategy to reduce risks in the supply chain by presenting accurate guidance for companies to reduce risks (Responsible Business, 2019). The five-step framework Due Diligence Guidance is visualised in the figure 6. Due diligence for responsible supply chains of minerals from conflict-affected and high -risk areas can be defined as ‘’an on-going, proactive and reactive process through which companies can identify, prevent, mitigate and account for how they address their actual and potential adverse impacts as an integral part of business decision-making and risk management systems.” (OECD, 2016, p. 66).

Figure 6: five-step approach OECD (OECD,2016)

2.2.3 Conflict Mineral Regulation 2017/821

Before establishing the EU CMR, the EU had placed its trust in transparency as a force for change, for example for ending the trade in "blood diamonds"(Vlaskamp, 2019). External events have created an increasing sense of urgency for the EU to develop a specific policy on conflict minerals. The Kimberley Process, is a commitment which has as goal to remove conflict diamonds form the global supply chain (Kimberly Process, n.d.), produced the idea that supply chain due diligence measures for conflict

resources would be an effective idea. The OECD Due Diligence Guidance set a global standard for responsible sourcing in conflict zones, and the US Dodd-Frank Act created both political and economic pressure on the EU to adopt a legally binding policy. Although the belief in transparency measures as an appropriate instrument were widely shared, the concrete content of the EU CMR was the subject of intense discussions between the different stakeholders. The Commission, the Council and industry wanted to retain the obligation to be as transparent as possible, because of the high cost of this policy; in the meantime, Parliament and the activist NGOs have campaigned for binding measures. The final policy draft is a compromise between these positions. The EU considered that promoting transparency in global supply chains had the most potential to achieve its economic and political purpose to combat potential conflicts and human rights abuse. This insight has resulted in the EU CMR. Besides the human rights issue, one of the political reasons behind EU CMR includes motivation to increase the insurance of the natural resources of the DRC. By strengthening the stability in DRC there will be less conflict, which will broaden the access to raw materials. Existing sanctioning regimes are often ineffective because of the problems of a limited state in the target regions (Vlaskamp,2019).

Review clause

A review clause is built in into the regulation to ensure that the EU Commission will evaluate the operation and effectiveness of this Regulation. This will happen by the first of January 2023 and every 3 years thereafter. This evaluation consists of the impact of this Regulation, including the promotion and costs of responsible extraction of the minerals falling within its scope from conflict and high risk areas, and the impact of this Regulation on Union operators. The Commission shall discuss the evaluation report with the European Parliament and the Council. The evaluation shall include an independent assessment of the share of the total Union downstream operators with tin, tantalum, tungsten or gold in their supply chain which have a due diligence system. The evaluation shall assess the adequacy and implementation of those due diligence systems and the impact of the Union system on the ground, as well as the need for additional mandatory measures to ensure sufficient leverage of the total Union market on the responsible global mineral supply chain (EU, 2017). The review clause could mean that the scope is going to be extended over time.

Responsible Sourcing

The EU commission describes the responsible sourcing as: *"The integrated EU approach on responsible sourcing is embedded in a wider comprehensive approach on conflict-affected and high-risk areas. These promote inter alia conflict resolution, peace and security, respect for human rights including the need to address trafficking in human beings, good governance and the rule of law and sustainable development." (EU,2014, p.2).*

Supply chain due diligence

Supply chain due diligence aims at identifying and addressing actual and potential risks when businesses source from regions affected by conflict and instability to prevent or mitigate adverse impacts, inter alia as regards the financing of conflicts, associated with their sourcing activities. The EU has been actively engaged in an Organisation for Economic Co-operation and Development (OECD) initiative to advance the responsible sourcing of minerals from conflict regions, which has resulted in a government-backed multi-stakeholder process leading to the adoption of the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD

Due Diligence Guidance, 2016) including specific supplements on tin, tantalum and tungsten, and on gold (EU, 2014).

The EU market consists of one of the largest world markets, which makes regulation necessary to stimulate and regulate responsible use of minerals. This is applied especially to the 3TG minerals, which sometimes are extracted by forced labour, causing human rights abuses or financing armed conflict. The CMR EU importers of 3TG need to meet the OECD Due Diligence Guidelines to give transparency of their action. The law will promote the responsible operation of smelters and refiners of 3TG sources worldwide and in the EU, disconnect conflict from illegal trade of minerals and end the abuse of local communities. EU importers have an obligation to identify and address actual and potential risks associated with conflict-affected and high-risk areas when conducting due diligence of their supply chain. It is the task of the EU member states to monitor whether EU importers comply with the requirements of the regulation. Indirectly, the regulation affects smelters and refiners of tin, tantalum, tungsten and gold, both inside and outside the EU. The reason for this is that EU importers of minerals and metals must ensure that they obtain supplies from responsible smelters and refiners (European Commission, 2017). The EU CMR contains different rules for upstream and downstream companies: Upstream companies have to comply with mandatory due diligence rules when importing as explained above. There are two types of downstream companies: Companies that import products from the metal phase have to comply with mandatory due diligence rules. The second type operates outside the metal stage and have no obligations under the regulation, however, they have an obligation to the public to source responsibility and practise SCR.

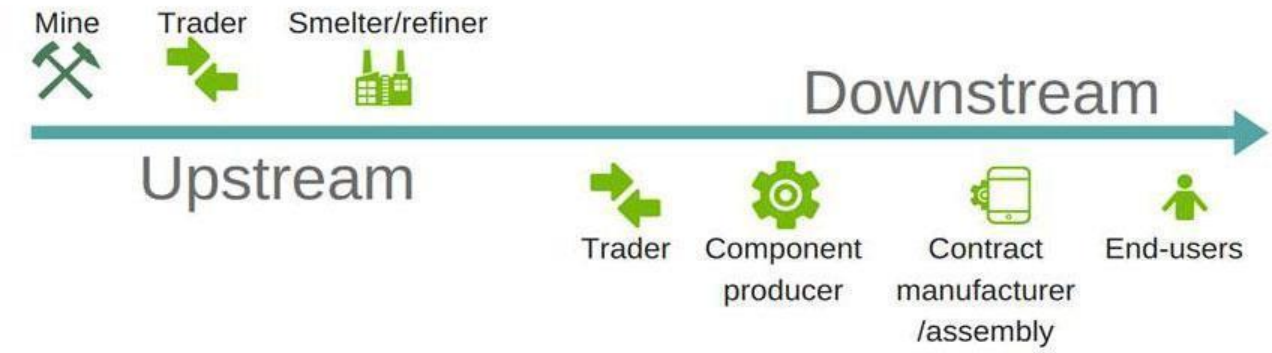

Figure 7: Supply chain upstream and downstream (EU commission, 2017)

The connection between the upstream and the downstream companies is the smelters and refiners as shown in figure 7. This step in the supply chain is small and there are not many smelters and refines compared to all the other steps in the supply chain. This is why the OECD and EU CMR choose this point to be checked (Young, Fernandes & Wood, 2019). Another important sidenote is that the origin of the mineral is not traceable after the smelting or refining process.

2.2.4 Difference between conflict minerals regulations and guidance

The United States was the first to adopt regulation concerning conflict minerals, with the Dodd Frank act section 1502 implemented in 2010 (Global witness, 2017). This act inspired Europe to develop regulation 2017/821. In this regulation European importers of 3TG minerals have to comply with responsible sourcing standards, developed by the OECD. The regulation aims at increasing focus on the issues concerning illegal exploitation of minerals, conflict and human rights abuse in the mineral

supply chain (European Commission, 2019). This disclosure only applies to larger companies with more than 500 employees, to not outweigh the benefits for the medium and small organisations (EU regulation, 2017). The difference between the Dodd Frank act, the OECD guidance and the EU regulation is shown in table 1:

Table 1: comparison conflict mineral regulations Dodd-Frank act, the OECD guidance and EU conflict minerals

Regulations/ guidance	Dodd Frank act 1502	OECD Guidance	EU regulation 2017/821
Implementation date	2010	2011	2021
Type	Mandatory	Voluntary	Mandatory
Scope of materials	3TG	All materials	3TG
Geographic scope	Democratic Republic of the Congo and adjacent countries	Conflict-affected and high-risk areas	Conflict-affected and high-risk areas
Developed for/ target audience	All companies who need to file a SEC	All companies and government organisations	Importers - checkpoint smelters & refiners

2.3 How does the European conflict minerals regulation 2017/821 relate to responsible sourcing?

To answer the first sub-question ''How does the European conflict minerals regulation 2017/821 relate to responsible sourcing?'' literature, policy documents and support reports have been analysed. Responsible sourcing includes social, environmental and economic dimensions, while both the EU conflict minerals regulation 2017/821 and the OECD guidance primarily focus on social harm, human rights abuse and conflict. This chapter connects the view of governance, civil society, industry and academia. Governance in the form of the European commission made the regulation, civil society support companies to comply, industry have to obey the law and the academia do research on how the law is implemented and how the law is functioning long-term. The connection of the four groups, their relevance and their interconnectedness are discussed and illustrated in chapter 3.

3. Framework & methodology

This thesis carries out an exploratory research into how companies and governance deal with the new conflict minerals legislation 2017/821 using mixed methods. To understand the interconnectedness between the stakeholder groups the theoretical framework of the quadruple helix is explained how it is used. The research design uses a literature background on certain concepts, a case study and stakeholder interviews. Which the case study is qualitative what is made quantitative and the interviews qualitative. This exploratory research starts with a thorough background analysis. It is followed by a case study, which includes: company selection, open data assessment and company interviews. Lastly expert interviews with stakeholders are conducted and analysed using the thematic analysis method.

3.1 Theoretical framework

For research into conflict minerals, there is no single theory or model that is used to explain or compare companies and stakeholders. Previous studies (Siva and Schaltegger, 2019) have made an overview of all literature on management approaches and social assessment of social issues in supply chains and conflict minerals. They showcase that 17 out of 51 articles about management of conflict minerals are using the stakeholder theory. Stakeholder perspectives and institutional regulation for managing and assessing social issues in supply chains have been seen as the key to understanding conflict minerals (Siva and Schaltegger, 2019). For gaining a complete understanding of the problems regarding conflict minerals the responsibility, guidance and cooperation of all stakeholders need to be included in this thesis. The quadruple helix framework is useful for this purpose because it includes all the stakeholders: governance, industry, academia and civil society (see figure 8). The quadruple helix is an interdisciplinary and transdisciplinary framework that is used to analyse complex challenges in need of innovative solutions (Etzkowitz & Leydesdorff, 2000). Carayannis and Campbell (2009) describe the quadruple helix as a representation of the mode 3 ecosystem that consists of people, culture and technology.

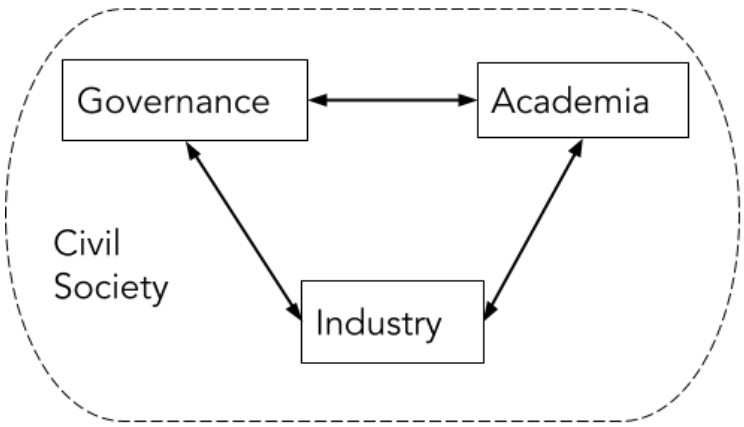

Figure 8: Quadruple helix.

3.1.1 Motivation for the Quadruple helix framework

The quadruple helix is a representation of the ecosystem mode 3 of people, culture and technology. With a focus on the public, private, technological and scientific and lastly top down and bottom up interactions (Carayannis and Campbell, 2009). Among other goals of the quadruple helix as framed in Caryannis and Campbell is to "reveal opportunities for optimising public sector policies and private sector practices" (2009, p3). This goal fits perfectly in this research about private sector practices and public sector polices. The quadruple helix framework was created to serve as a "creative whiteboard space" (Caryannis and Campbell, 2009, p 26) to tackle challenges and create insights.

The model describes the connection between governance, industry, academia and public, which is important for this research because they influence and change each other through interactions. Siva and Schaltegger found that most research about conflict minerals management and social issues assessment uses stakeholder theories (2019). The quadruple helix is used in literature to describe the interactions between stakeholders, which will be different in every case to which it is applied (Todeva, 2013). Because of the focus on stakeholders and their relations with each other the quadruple helix is a way to describe and analyse these different sectors of stakeholders and can thus be categorised as a stakeholder theory.

Quadruple helix is used in sustainable development studies as a way to connect sectors to work together to create knowledge to come to suitable solutions (Saviano et al., 2019). Quadruple helix can be described as a network of relationships (Hasche, Höglund & Linton, 2019). Sustainable development is connected to conflict minerals by being not durable in the long term both social and environmental. In this research the quadruple helix is used as a basic but inclusive policy-industry system.

The quadruple helix is a suitable theory to aid in answering the research questions of this thesis. This is evident by the aspects elaborated in the previous paragraphs. In summary, the quadruple helix was created to capture interactions in a top down process, like e.g. a policy introduction by government. The quadruple helix captures the different sectors involved in the CMR and allows them to be represented as a stakeholder theory. And finally, the quadruple helix has been proven to be effective when applied to sustainable development studies.

3.1.2 Quadruple helix implementation

The quadruple helix is used as a basis for structuring the thesis, as can be seen in figure 8. The green oval describes the topics that will be handled in-depth with a literature review. A case study of the industry and interviews with representatives of all four sectors will be employed to illustrate all the connections between the four different sectors. Finally, the framework is used to give recommendations to the sectors in chapter 7.5. In Appendix B all relevant papers contributing to the concepts in the green oval in figure 9 are structured.

The four stakeholder groups of the quadruple helix are further explained in application of this research. Governance specifically refers to the government. Industry refers to the electronic producing companies. Academia are those stakeholders who are researching conflict minerals. Lastly,

the civil society are NGO's and initiatives that support governance and industry to achieve a responsible use of conflict minerals.

Governance

The governance sector as described in this thesis includes all the government parties involved in the legislation and enforcement of the CMR. This includes the EU parliament that made the regulation and are responsible for the revision, as well as governing bodies from every EU country which have to enforce the regulation. Lastly, it includes the parties whom are making support tools for companies from within the EU government.

Industry

The Industry sector refers particularly to the electronic producing companies. Those companies use 3TG in their products and therefore potentially use conflict minerals. The electronic producing companies have to deal with in a certain level with the EU CMR they use minerals but are not necessarily the importers. If the company imports raw materials it will be directly affected by the regulation. If the company import semi-finished products they will not fall directly under the regulation, but they are still responsible for the minerals they use in their products.

Academia

Academia are all the researchers conducting research concerning the conflict minerals. The topic of conflict minerals is still quite new, which means that so far relatively little research has been conducted. Siva and Schaltegger (2019) reviewed 51 articles about the management and social assessment of conflict minerals; one of the main findings was the current lack of a theoretical structure for management and social assessment of conflict minerals.

Civil society

The civil society includes the civil society and the media. This therefore includes NGO's and initiatives supporting industry and governance for responsible use of 3TG. Civil society further consists of charities, community groups, professional associations, trade unions and social movements. The civil society has tools to name and shame companies if they score low in ratings but also lobby activities to steer the governance. The consumers of the electronic products of the industry are included in the civil society.

The thesis structure filled in the quadruple helix framework as visualised in figure 9. The figure shows the structure of the sectors in relation to conflict minerals. The green oval is handled during the literature background and the thesis will provide recommendations for improvement for the four different sectors.

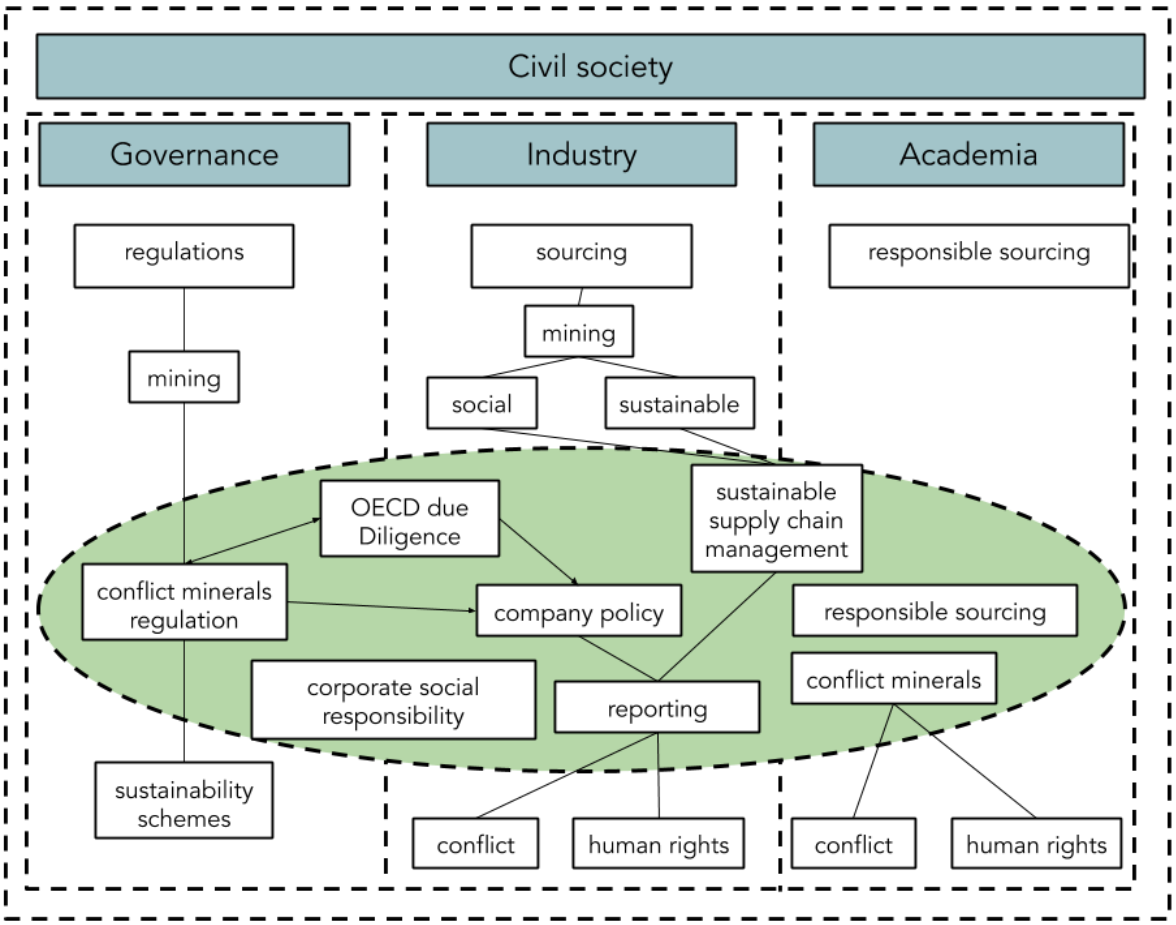

Figure 9: Structure of the quadruple helix: governance, industry, academia and civil society

3.2 Methodology

The research design of this thesis is using mixed methods: Literature background study, regulation review, case study and stakeholder interviews. This research starts with literature search to generate a background knowledge of the concepts related to conflict minerals and to help answer the first research question: ''How does the European conflict minerals regulation 2017/821 relate to responsible sourcing?''. The Case study together with the stakeholder interviews will provide the data for the second and third research question.

3.2.1 Research design

In this research design both quantitative and qualitative research is used. Starting with the literature research, the Wolfswinkel method is used to structure relevant articles and concepts. The concepts are researched in the online search tool Scopus. The second part of the literature research focusses on the regulation and guidance of conflict minerals and compares them with each other.

The case study method is used (Yin, 2009) to understand and compare companies with each other. The case study consists of a comparison of the conflict mineral due diligence of Amsterdam based companies. To allow an objective assessment the due diligence rating framework made by RSN is used. The case study begins with the company selection using selection criteria relevant to the case study.

Secondly, the RSN framework method is presented, and it is explained how to use the open data to give each company a due diligence rating. Thirdly, company interviews are used to validate the results of the due diligence rating and to gain more knowledge of how companies are positioned towards the EU CMR. For the analysis of qualitative data the method thematic analysis is used. The method consists of three phases for the data namely: identifying, analysing and interpreting patters of meaning (Clarke and Braun, 2017). The analysis of the interview data consists of codes and themes. A flexible combination of two coding methods, grounded theory 'emergent' coding and framework analysis 'structured' coding, is used (Braun and Clarke, 2006).

Lastly stakeholder interviews are conducted in order to gain more overall knowledge of the EU CMR. This stakeholder interview data is again analysed with the thematic analysis, only using different codes and themes.

3.2.2 Methodology literature background

For the understanding of the literature applicable for this thesis articles are used by searching the following keywords:

- Conflict minerals
- Governance law or regulations
- Human rights
- Responsible sourcing
- Supply chain
- (Sustainable) mining

At the start of the search, a broader range of concepts were used, however, these resulted in less relevant articles. The search with all the selected six keywords did not give a hit in Scopus. Scopus is a compiled citation and abstract database for scientific papers, books and other documents. Therefore, the three concepts with the most potential for relevant articles were used, which are responsible sourcing, conflict minerals and supply chain. These three keywords provided a focus on eight articles found online in Scopus. Together with one article on the terminology of responsible sourcing in the mining industry (Van den Brink et al., 2019) these are considered to be the nine key articles for this thesis. They are underlined in Appendix B. The literature is structured with the Wolfswinkel method (2013). Appendix B demonstrates that the most relevant articles have the most check marks (✓) for the concepts used in the article. Other earlier literature research and the snowball effect from the key articles gave the other seven articles listed in the table in the appendix B.

3.2.3 Review of guidance and regulations with background

Handling the different regulations and governance guidance structures is done in chapter 2.2. In the review the regulations and guidance are plotted against implementation date, mandatory or voluntary, scope of materials, geographic scope and target audience. Chapter 2 answers sub-question one using literature about responsible sourcing, policy documents and reports about the governance and support of conflict minerals.

3.3 Case study

In order to preserve the extensive and meaningful aspects of real events, the case study method is used (Yin, 2009). The case study consists of a comparison of the conflict mineral due diligence of

Amsterdam based companies to global assessment, using the RSN framework. The case study starts with the company selection based on selection criteria relevant for the case study. Secondly, the RSN framework methodology is presented and it is explained how the open data can be used to give each company a due diligence rating. Thirdly, company interviews are used to validate the results of the due diligence rating and to gain further knowledge on how companies are positioned towards the new conflict minerals regulation.

3.3.1 Company selection

The decision of the scope of the company selection is based on location, the focus of the company, open data and willingness to give an interview. These criteria are selected because of the focus of the research and the feasibility of carrying out the research. The location is important to be able to narrow down the number of companies to choose from. Amsterdam has been chosen as a boundary for the research into companies. This choice is driven by the MADE Master programme focus area, as well as personal time and resource constraints. 3TG is necessary for electronic products such as mobile phones, computers, laptops, tablets, but also cars and almost all other electronics. For this reason, the focus on companies is on electronics producing companies. Open data is essential for rating the company on their due diligence. Lastly, an interview with the correct department is suggested to get the most insight into the company view and their willingness to solve the conflict minerals issue.

Appendix C shows the long list of 18 companies first starting with exporters and semi-finished electronics but because of one of the selection criteria was not met and due to time constrictions, they are not included in the case study. The companies that meet most of the criteria and are therefore included in this study are displayed with the selection criteria in table 2. Philips is included because it meet all the criteria. Both Fairphone and Tesla did not have an interview which is unfortunate but open data is used to fill up the space of the interview to be able to answer most of the interview questions. TomTom is included because of the clarifying statement over the mail answering half of the interview questions. Automotive company is included because although the interview was not with the right person, clarifying information came up.

Table 2: Company selection criteria

Company	Amsterdam headquarters	Electronics producing	Open data on conflict minerals	Interview possibilities right person
Automotive company	✓	✓	✓	~
Fairphone	✓	✓	✓	x
TomTom	✓	~	~	~
Tesla	✓	✓	✓	X
Philips	✓	✓	✓	✓

Legend ✓ = yes x = no ~ = slightly

3.3.2 Due diligence rating

The due diligence rating structure is developed by the RSN. The RSN is a non-profit organisation that is committed to ending forced labour and human rights abuse related to raw materials found in daily used products. RSN has published a yearly report which shows that, despite the Dodd frank act article 1502, companies fail in their due diligence concerning responsible sourcing of conflict minerals. The RSN uses a due diligence scoring method that in 2019 besides Securities and Exchange Commission reports (SEC), included open data from eight different organisations. Using the RSN grid is interesting to compare the due diligence of companies with each other. This thesis makes a comparison between consumer producing electronic companies in Amsterdam using the empirical RSN methodology on open data.

Table 3 : Due diligence rating structure RSN (2019)

Theme	Category	Criteria
RISK MITIGATION (60%)	Strategy (20%)	Conflict-Free Minerals Policy (10%)
		Policy Accessibility (2%)
		Internal Management System (8%)
	Risk Assessment (20%)	In-Scope Determination (3%)
		Response Verification (3%)
		Describe the facilities where minerals are processed (6%)
		Assessment ratios (3%)
		Country of Origin (5%)
	Risk Mitigation (20%)	Response to Risk at SOR level (10%)
		Supplier Risk Management (10%)
HUMAN RIGHTS IMPACT (20%)	Outcomes (12%)	Conflict-Free Sourcing (5%)
		Company prevents embargo of conflict-free sources. (4%)
		Identification and measurement of social outcome(s) (3%)
	Engagement (8%)	Support of in Region Sourcing (3%)
		Support of in region Project (3%)
		Participation in multi-stakeholder initiative (2%)
REPORTING (20%)	Alignment (15%)	Continuous Improvement (5%)
		Implementation of OECD Step (6%)
		IPSA (Independent Private-Sector Audit) (4%)

	Transparency (5%)	Publicly Available Information (3%)
		Risk Assessment outside the disclosure (2%)

The due diligence rating structure is based on how companies cope with their risk mitigation of conflict minerals, human rights impact and reporting. This theme structure is translated in key performance indicators (KPI) these indicators form criteria which form categories and form themes displayed in table 3. The KPI's are not able to show because that companies could specifically add statement to their reports to create a higher score. The KPI's are divided into criteria included with the percentage of contribution to the due diligence score table 3. Each criterion consists of KPI's from 1 till 8 where the company can comply with. If the company complies, they get a part of the score of the criteria. If the company meet all the KPI's of the criteria, the company will get all the points of these criteria. Appendix 0 include the complete RSN grid were all KPI's per criteria are displayed. The due diligence rating structure of RSN consists of three themes: Risk mitigation, human rights impact and reporting. This structure is used to analyse the open data from the selected case study companies. The RSN has provided insights into the structure for the benefit of this thesis, on the condition that the detailed structure is not shared. From the document mining the disclosures 2019 (RSN, 2019) it became clear how detailed the structure is indicated and published, the same type of detail is used for this thesis. The fulfilled in due diligence rating can be found in external Appendix 0. The RSN report 2019 reviews 207 companies on their SEC reports. The RSN also assessed eight companies without an SEC report because they did not have to file this type of report. These companies are examined based on their open data about policies to source responsibly and avoid conflict minerals. To test the structure the assessment of Philips was repeated and compared with the RSN score. The first step is to collect open-source data about conflict minerals policies from the selected businesses. Therefore, three search terms are used: conflict minerals, policies, due diligence and sustainability schemes. All the identified open data are included in Appendix C, here all the document names are listed. The rating structure of RSN is tested, Philips has been scored and analysed by RSN, they were granted a score of 77.4. In this research, the score is almost the same 77.1, which means that the rating structure appears to be almost correctly implemented.

3.3.3 Company interviews

Representatives of two companies have been interviewed, namely Philips and the automotive company. TomTom gave a statement based on the interview questions and Fairphone did not have time for an interview. For Fairphone information published in two of its own blogs about the company in relation to conflict minerals have been used. Those blogs contained almost as much information as the interviews. Table 4 provides insight into the source of information, job title of the person who provided the information and the company. Questions about the following aspects were asked: Awareness of companies about the EU CMR and RS. A validation of the RSN due diligence score and their reaction on the score. Understanding on how companies see the EU CMR. The willingness of companies to comply with the regulation and the challenges for companies. And lastly If companies experience a connection with CE and EU CMR and RS. Appendix E gives more insight in the questions asked.

Table 4: Source of information per company case study

Source of information	Job title	Company
Interview	Supply Operations Manager	Automotive company
Blog	Chief Sustainability Officer	Fairphone
Statement	Quality engineer	TomTom
Impact report	-	Tesla
Interview	Supplier Sustainability Officer	Philips

3.3.4 Thematic analysis of case study data

Thematic analysis is a method of analysing qualitative data, important components of this method are identifying, analysing and interpreting patters of meaning (Clarke and Braun, 2017). The goal of the thematic analysis is to connect statements from different data and to extract underlying significance according to the codes and themes shown in table 5. The intention is to understand the way in which companies act on the various themes. The themes are concepts that originated from the codes. The codes were pre-set but changed during the analysis; the starting codes were: awareness, due diligence, transparency, responsible sourcing and implementation. These codes involved to more specific codes as shown in table 5. For the analysis Atlas TI is used because of the clarity of the program and the overview of all data. The transcript documents, the statement and the blogs were loaded into the program Atlas TI to be coded with the codes shown in table 5. The five themes arise from the codes. These codes are: awareness of EU CMR and responsible sourcing, positive aspects and limitations of EU CMR, transparency of the supply chain, next steps forward and CE & CM. The codes that are being used to make the themes are displayed in table 5. In the case study result chapter the data is structured using the themes made in the thematic analysis. The blue highlighted box is used for powerful quotes from the data used, the type of data used is different for every case, which will be discussed per case in chapter 4. The themes used for the thematic analysis are different as the themes described by the RSN in chapter 3.3.2.

Table 5 Code and themes case study

Codes	Themes
Awareness of EU CMR	Awareness of EU CMR and RS
Awareness of responsible sourcing	
Positive aspects of EU CMR	Implementation of EU CMR

Limitations of EU CMR	
Transparency	Transparency
Supply chain	
Due diligence	
Steps to take	Next steps forward
Ways to improve	
Circular Economy	Circular Economy

3.3.5 Case study structure

The case study of this thesis consist of 5 cases that are studied, for three companies this consist of the case introduction, RSN explanation and the thematic analysis. For two cases only a short introduction and the thematic analysis is used because the RSN analysis was not possible. The five cases are combined in the last chapter of the result chapter 5.

Case introduction

The introduction starts with the founding date of the company, followed by a time line with the type of product produced. Secondly, the goal of the company and its ideals is presented. Lastly, a glimpse is provided into environmental awareness of the company.

Due diligence rating explanation

The outcomes of the RSN are shown in a table, which gives points per criteria and combined per team to give an overview of the total earned score. Next, the table is elaborated in further detail and closed with possible improvement to increase the score.

Thematic analysis

After analysing the data from interviews, reports and blogs with many codes five combined codes are chosen and used to demonstrate the results. These combined codes are as follows: awareness of EU CMR and responsible sourcing, positive aspects and limitations of EU CMR, transparency, next steps forward and CE & CM.

Combining all case study results

Combining all findings creates an overview of the awareness and transparency of the companies. Due diligence structure of the RSN grid is compared per company, which enables seeing the different outcomes of the companies. For the thematic analysis the combined codes are used in a table with the statements from the companies, which also creates an overview of all companies.

3.4 Stakeholder interviews

Semi-structured interviews are used as qualitative and in-depth interviews. There is a general interview schedule with predetermined, more generally formulated questions where deviations were possible, which gives more and detailed information. These general interview questions are all listed in Appendix E.

3.4.1 Selecting interviewees and conducting interviews

The questions guiding the interview were:

- Knowledge of interviewees about conflict minerals and responsible sourcing
- Positive and negative aspects of the EU CMR
- Development of the EU CMR for the future
- Role of civil society in the topic of conflict minerals
- Role of future research in the topic of conflict minerals

In total, twelve stakeholders were contacted by email for an interview. Yet, only six stakeholders were willing to give an interview, from every sector from the quadruple helix except the industry as shown in table 6. The industry is already interviewed in the case study (see chapter 5). Interviewees are selected based on their broad view about conflict minerals in their work from the three different sector's governance, academic and civil society. The interviews are captured using recording and written notes. The interviewees received a list of the prepared questions so that they could give an extensive answer. All interviewees filled in the consent form about research ethics who can be found in appendix D.

Table 6: Stakeholder interview details

Sector	**Job title**	**Department / organisation**	**Interviewees**
Academic	Industrial ecologist	University of Waterloo	Seven Young
	PhD researcher	UN University and PhD Leiden	Susan van den Brink
Civil society	Minerals Program Associate	Responsible Sourcing Network (RSN)	Raphael Deberdt
Governance	Social envoy to natural resources	Ministry of Foreign Affairs	Dirk-Jan Koch
	Advisor inspector	Government	Advisor inspector
	Policy Analyst	OECD	Luca Maiotti

3.4.2 Thematic analysis of interview data codes

For the analysis of qualitative data the method thematic analysis is used. The method consists of three phases for the data namely: identifying, analysing and interpreting patters of meaning (Clarke and

Braun, 2017). The analysis of the interview data consists of codes listed in table 7 which are used in a thematic analysis of the interview data. A code is a label indicating which part of the data is relevant (Clarke and Braun, 2017). All the data that is used in this analysis originates from the stakeholder interviews. Quotes are reported during the coding process and assembled in table 14 chapter 5.1. A flexible combination of two coding methods, grounded theory 'emergent' coding and framework analysis 'structured' coding, is used (Braun and Clarke, 2006).

The descriptive coding analysis is employed to analyse the data from the coding. These include the literal interpretation of the words in the text. The codes devolved during the coding in more specific codes listed in table 8. The codes are used for a thematic analysis of all the data and to be able to compare and reflect.

Table 7: start codes to analyse the interview data

Awareness
Due Diligence
Transparency
Responsible sourcing
Implementation

Table 8: developed codes used for coding the results

Awareness
Responsible sourcing
Due diligence challenges
Implementation
Positive aspects of EU CMR
Negative aspects of EU CMR
Limitations of EU CMR
Transparency
Largest obstacle of the EU CMR
First and next steps
CE and conflict minerals

4.0 Case studies

This chapter describes the results from the case study. This includes an introduction of the company, a table with the RSN grid results, a description of the RSN grid and the results from the interviews with the case companies. Chapter 4.1 describes the case study of Fairphone including an introduction, the open data analysis and statements about the view of Fairphone on CMR. Chapter 4.2 describes the case study of Tesla in the same structure as 4.1, where statements are also used. In chapter 4.3 Philips is analysed, use has been made of and interview. Chapter 4.4 describes two stand-alone interviews without RSN analysis, as the necessary data was not available. TomTom and an automotive company are discussed using the same codes as the interviews and reports of paragraph 4.1.3, 4.2.3 and 4.3.3. Lastly, chapter 4.5 compares the three different case studies by using the RSN Grid in table 12. The statements of the covered codes by the different companies are summarised in table 13. All these studies lead to an answer of the second research question: ''*What level of company awareness and transparency is present concerning conflict minerals regulation?''.* Below an introduction of how the case study is conducted explained in three points: The company selection and findings, the used open data for the analysis of the RSN grid and lastly the analysis of the company interview.

In the company selection one of the criteria consist of published data about due diligence of companies. During this research a list of 18 electronic companies was made, listing their sector of industry, location of headquarter and if data was available about their due diligence of the supply chain. The long list of companies in preparation of the research is listed in appendix C. A due diligence or conflict minerals report is required to be usable in this research. Seven of these 18 companies have a due diligence report or a SEC filing published online. This means that 37% of the examined companies had a due diligence report or SEC filing on their website. This indicates that less than the half of the companies have published data about their due diligence.

4.1 Fairphone

This section starts with an introduction of the company Fairphone. This is followed by an analysis of open data by elaborating the themes of the completed RSN Grid. Lastly, a thematic analysis is documented of the statements by Fairphone, in line with the themes presented in chapter 3. Open data on conflict minerals published by Fairphone has been used for this thematic analysis.

4.1.1 Fairphone introduction

Fairphone started in March 2010 as a project to campaign for awareness for the link between minerals mined in conflict areas and consumer electronics. The project started together with Waag Society, Action Aid and Schrijf-Schrijf. (Fairphone, 2016) The project and research about the supply chain of phones in public discussion was not sufficient for Fairphone. Fairphone decided that they only could get the system moving if they become part of it themselves (Keuchenius, 2016). With this decision, Fairphone became a social enterprise in 2013. Fairphone creates transparency in production chains to gain insight and to understand the way things are made. Transparency in the production systems is created by Fairphone, and they encourage discussions on fairness of electronics. Fairphone chose the mobile phones as a product to showcase the issues about conflict minerals and sustainability because everyone owns and uses them and can relate. It is tangibly increasing the visibility of the problem of

conflict minerals and circularity of the phone itself. The phone has a story to tell, how it is made and where it has been (Fairphone, 2016). Fairphones' goal is to create social impact, this is done using five pillars namely: social impact in the mining, the design, the manufacturing, the lifecycle and lastly the social entrepreneurship.(Fairphone, 2016) The five pillars can be splitting two important subjects, fair production and a longer service life of the product.

Fairphone has now produced 4 phones; Fairphone 1, Fairphone 2, Fairphone 3 and Fairphone 3+. The first phone of Fairphone was launched in May 2013 and the end of software maintenance and spare parts announced July 2017. The Fairphone 1 design was licensed from a manufacturing partner. This made that Fairphone had limited access to suppliers from long-term spare parts orders. Product Longevity of Fairphone 1 consist of: replaceable battery, created free repair manuals with iFixit to encourage do-it-yourself repair and spare parts are sold in the online shop. Fair materials, supported conflict-free tin and tantalum from the DRC. Fairphone 2 was launched in July 2015 with a custom and modular design. This design made it possible to have an ongoing sale of spare parts and the phone is easy to repair. The custom design gives Fairphone better access to suppliers. Product longevity included that with the modular design enables easy repair to help the phone last longer. Spare parts are unlimited for sale and the phone can be updated to the newest android version. Fair materials, the phone supported conflict-free tin and tantalum from the DRC, integrated conflict-free tungsten from Rwanda and Fair trade gold from Peru. The Fairphone 3 was launched in Augustus 2019. The Fairphone 3 is made with the conflict free tin, tantalum, tungsten and gold, but also with the use of 9% post consumer recycled plastics instead of new plastics. The Fairphone 3+ has a big improvement of using recycled plastics, the phone is made with 40% recycled plastics and is the most sustainable phone Fairphone ever made.

4.1.2 Due diligence rating of Fairphone

Fairphone is rated using the RSN grid. To fill out the RSN grid ten documents of Fairphone were used, the documents used can be found in Appendix 0. The open data documents vary from code of conduct, the Fairphone factsheet to a smartphone materials profile. Table 9 is explained in the next section and divided per theme. The themes are risk mitigation, human rights impact and reporting. Themes are all subdivided into categories: strategy, risk assessment, risk mitigation, outcomes, engagement, alignment and transparency. In turn, the categories are subdivided into criteria.

Table 9 detailed RSN Grid Fairphone

Theme	category	criteria	score	Total per category
RISK MITIGATION (60%)	Strategy (20%)	Conflict-Free Minerals Policy (10%)	10	20.0
		Policy Accessibility (2%)	2	
		Internal Management System (8%)	8.0	
	Risk Assessment (20%)	In-Scope Determination (3%)	3	19.5
		Response Verification (3%)	2.5	
		Describe the facilities where minerals are processed (6%)	6	

		Assessment ratios (3%)	3	
		Country of Origin (5%)	5	
	Risk Mitigation (20%)	Response to Risk at SOR level (10%)	6	14.3
		Supplier Risk Management (10%)	8.3	
HUMAN RIGHTS IMPACT (20%)	Outcomes (12%)	Conflict-Free Sourcing (5%)	5	10.2
		Company prevents embargo of conflict-free	4	
		Identification and measurement of social outcome(s) (3%)	1.2	
	Engagement (8%)	Support of in region sourcing (3%)	1.7	6.0
		Support of in region project (3%)	3	
		Participation in multi-stakeholder initiative (2%)	1.3	
REPORTING (20%)	Alignment (15%)	Continuous Improvement (5%)	3.3	11.3
		Implementation of OECD steps (6%)	6	
		IPSA (Independent Private-Sector Audit) (4%)	2	
	Transparency (5%)	Publicly Available Information (3%)	3	5
		Risk Assessment outside the disclosure (2%)	2	
				86.4

Risk mitigation

For the risk mitigation theme Fairphone earned the maximum score of the measurable conflict minerals policy and policy accessibility but in the internal management system there is some improvement possible. In the risk assessment Fairphone missed some points on the response verification. While the other statements of the risk assessment category earned the maximum score. This includes the in-scope determination, facilities in which minerals are processed, assessment ratios and country of origin. Defining in scope a scoping process for product categories that can determine whether they contain conflict minerals, this is one of the statements that contribute to the criteria in-scope determination. Improvement is possible in the risk mitigation theme in the criteria response to

risk at SOR level and on the supplier risk management, but scores are already sufficient. In summary Fairphone scores good on the theme risk mitigation.

Human rights impact

In the outcome's category of human rights impact theme the maximum score is almost earned. For the conflict-free sourcing and preventing an embargo of conflict free sources Fairphone earned the maximum score. Only the Identification and measurement of social outcomes is missing a small component to achieve the maximum score. The engagement of human rights impact and the support of in region project is scored maximum. While improvement is possible for Fairphone on the support of in region sourcing and participation in a multi-stakeholder initiatives giving them a sufficient score for these statements.

Reporting

For the continuous improvement goal, which is part of the alignment category, Fairphone has missing some steps in the framework on effective reporting. For the implementation of OECD Step Fairphone earned a maximum score for this statement. There is an Independent Private-Sector Audits conducted for the suppliers of Fairphone, but it is not included in any report what result in half of the maximum score for this statement. For the transparency category Fairphone scores the maximum score on both the public available information and on the risk assessment outside the disclosure.

Overall Fairphone scores the label leading with a score of 86 out of 100, but there is still room for improvement. According to the RSN measurement grid the most impactful improvement possibilities for Fairphone are in the alignment category. Fairphone scored the half of the maximum score on the Independent Private-Sector Audit, by not including the audit on their website. Fairphone also scores low on the continues improvements, this requires clear steps towards the goal.

4.1.3 Statements Fairphone

This paragraph classifies statements about awareness of CMR and RS, CMR, transparency and the next steps to take. This will explain how Fairphone is dealing with these issues and their positions. Open data on conflict minerals published by Fairphone has been used, the titles of the blogs and the report were: “Selecting a Production Partner” (Ansett,2013), “New EU conflict minerals legislation: another step towards industry-wide change”(Gerritsen, 2017) and “We’re here and we’re here to stay” (Fairphone,2018).

Awareness of EU conflict minerals regulation and responsible sourcing

Fairphone is aware of the EU CMR and considers the EU CMR as a valuable stepping stone towards responsible sourcing. (Gerritsen,2017)

Implementation of EU CMR

Fairphone hopes that the law will initiate importers to take the next step and will do more than is compulsory. Fairphone states that a regulation is not enough for a change in the system. (Gerritsen,2017)

"The risk of mandatory reporting is that companies, in this case importers, completely stop doing business in these regions, negatively affecting the exact same areas the law is trying to help. Recognizing this, the final legislation will be accompanied by other measures to ensure the law is effective and has a positive effect on the ground"(Gerritsen,2017)

Transparency

Creating transparent in supply chains and supporting the development of local economies takes resources and investment, and will in many cases mean accepting instead of mitigating risks on the short to mid-term. Mining sites in high risk areas often provide a significant income for the surrounding communities. However, it requires significant effort, time and engagement to facilitate a long term development from high to low risk mine sites. In order to avoid that whole regions depending on mining income will be drawn further into a poverty cycle, market access and investments in local communities are crucial. Market access itself requires that systems are in place to enable the tracing of a certain material to its origin and monitor the production circumstances (Gerritsen,2017).

"Additionally, developing transparent, trust-based, and long-term relationships with suppliers can alleviate problems and lead to more sustained change." (Ansett,2013).

Next steps forward

Fairphone agrees that collaboration between stakeholders is needed in order to leverage expertise, resources, and understanding of the local context. Fairphone highlight that the rest of the industry such as the brands have a role to play here as well, as they can incentivise and reward importers that source responsibly from conflict and high-risk areas by linking their supply chain to these sources. The market also plays an important role. Fairphone strongly believes that companies will change their practices once they see the market value. As consumers become more aware of the issues, they can demand for an increased transparency and buy fairer products. Similarly, other incentives such as government procurement play a role here. In the end, companies with fair, sustainable, transparent supply chains should be rewarded with a competitive advantage. (Gerritsen,2017)

"Civil society, including non-profit organizations, industry watchdogs and the media need to keep making noise. They have the task of continuing to inform readers as well as draw attention and challenge the entire industry and government about issues, challenges and successes throughout the electronics industry "(Gerritsen, 2017).

Circular economy & conflict minerals

The goal of Fairphone is to move towards a circular economy. The first step is to extend the lifetime of the materials in Fairphones to the maximum. Both the ease of repair and the repetition of this process is important to keep the Fairphone as long as possible in use. Fairphone wanted to understand the end of life phase of a phone but also to create and share knowledge about recycling in the whole industry. Recycling of electronics is not per definition only positive; it costs a lot of energy to recover materials out of electronics which can cause environmental damage. It is a trade-off between metal

depletion, plastics and energy use. Plastics can give a positive input in the recycling process because they can create energy in the process and create environmental benefit (Fairphone, 2018).

4.2. Tesla

The chapter starts with an introduction of Tesla. This is followed by an analysis of open data by elaborating the themes of the RSN Grid. Lastly, the statements are clarified about awareness of CMR and RS, positive and limitations of CMR, transparency and the next steps to take. Open data on conflict minerals published by Tesla has been used.

4.2.1 Introduction of Tesla

This paragraph will give more information about the company Tesla, when is it established, what does it sell and what is the goal and motivation of the company to do so. Lastly but not unimportant, the sustainability goals of the organisation and how they are dealing with this is described.

Tesla is an automotive company focused on electric driving and electric cars. Founded in 2003 in America. The European headquarters is situated in Amsterdam. The first intention of Tesla was to create an electric sport car with no concessions (Tesla, z.d.). So far Tesla has produced four types of cars; Model S, Model x, Model 3 and model Y. Model S has become the electric sporty car with no concessions it is faster, safer and more efficient than a normal fossil fuel powered car. Model X is the real sport car. “The goal of Tesla is to accelerate the world’s transition to sustainable energy” (TCMR, 2018).

Tesla invests in the battery and solar panel technology. Tesla envisioned a future with electricity from the sun, solar panel electricity storage in battery and sustainable transportation with electric cars (Tesla,2019).Tesla is driven by sustainability, and claim that their products are sustainable. They are now also working on sustainably too. This includes the manufacturing process. Tesla published its first impact report in 2019, this impact report consist of product impact, operational impact, supply chain and employees and culture. This report gives more insights about the environmental impact of solar energy and electric driving. The report addresses the ambition of Tesla to have their own battery recycling plant in their mega factory. In addition, Tesla describes how they visit many cobalt mines and processing plants who are part of the supply chain of Tesla in order to discuss possible risks and doing due diligence checks. (Tesla,2019)

4.2.2 Due diligence rating of Tesla

For Tesla five documents are used to fill out the RSN grid, the conflict minerals report, the impact report and the suppliers' code of conduct document. Table 10 is explained in this subchapter and each paragraph covers one of the themes of the RSN grid. The themes are risk mitigation, human rights impact and reporting. Themes are all subdivided into categories: strategy, risk assessment, risk mitigation, outcomes, engagement, alignment and transparency. In turn, the categories are subdivided into criteria.

Table 10 RSN Grid Tesla

Theme	category	criteria		Total per category
RISK MITIGATION (60%)	Strategy (20%)	Conflict-Free Minerals Policy (10%)	7.5	17.5
		Policy Accessibility (2%)	2.0	
		Internal Management System (8%)	8.0	
	Risk Assessment (20%)	In-Scope Determination (3%)	1.0	7.2
		Response Verification (3%)	1.5	
		Describe the facilities where minerals are processed (6%)	2.4	
		Assessment ratios (3%)	1.0	
		Country of Origin (5%)	1.3	
	Risk Mitigation (20%)	Response to Risk at SOR level (10%)	0.0	6.7
		Supplier Risk Management(10%)	6.7	
HUMAN RIGHTS IMPACT (20%)	Outcomes (12%)	Conflict-Free Sourcing(5%)	3.3	3.9
		Company prevents embargo of conflict-free sources. (4%)	0.0	
		Identification and measurement of social outcome(s) (3%)	0.6	
	Engagement (8%)	Support of in Region Sourcing(3%)	0.0	0.7
		Support of in region Project(3%)	0.0	
		Participation in multi-stakeholder initiative (2%)	0.7	
REPORTING (20%)	Alignment (15%)	Continuous Improvement (5%)	5.0	13.0
		Implementation of OECD Step (6%)	6.0	
		IPSA (Independent Private-Sector Audit) (4%)	2.0	
	Transparency (5%)	Publicly Available Information (3%)	2.0	2.0
		Risk Assessment outside the disclosure (2%)	0.0	
				51

Risk mitigation

In the strategy category of the risk mitigation theme Tesla earned the maximum score on the policy accessibility and the internal management system. For the risk assessment category Tesla has a severely insufficient score for all the criteria because the missing reporting on risk assessments on the supply chain ranging from country of origin of the 3TG minerals to the response verification of information gathered from the supply chain. In the risk mitigation category there is a big difference between the two criteria. The response to risk at SOR level is zero while the supplier risk management statement is sufficient. This is due to the fact that the risks on SOR level are not well removed through interventions in the region.

Human rights impact

At the human rights impact theme Tesla does not score well. In the outcomes category only the conflict-free sourcing criteria scores sufficient. The other criteria are severely insufficient, with the preventing embargo of conflict free sourcing as the lowest with zero points. The engagement category scores even worse than the outcomes category. For the participation in multi-stakeholder initiatives Tesla scores one point. Tesla does not provide support of in region sourcing or support of in region projects, resulting in a zero score in both criteria.

Reporting

Tesla has an overall more than sufficient score for the alignment category in the reporting theme, with a maximum score for the continuous improvement criteria and the implementation of OECD steps criteria. The independent private-sector audit can be improved by adding the audit to the SEC filing. In the transparency category, risk assessment outside the disclosure is missing and therefore earned a score of zero. For the publicly available information Tesla has a lack of information but still scores sufficient.

Overall Tesla scores barely sufficient with a score of 51 out of 100 which means that there is a lot of improvement possible. Tesla does not focus on conflict minerals while they are working to responsibly source cobalt and check smelters of cobalt, which they do not do for 3TG. This could easily improve their rating a lot at the response to risk at SOR level for 3G smelters or refiners. In the human rights impact theme almost everything needs to be improved only the statement conflict free sourcing is sufficient. This improvement consist of stimulating suppliers to keep sourcing from the DRC from certified conflict free mines. But also supporting in region projects and in region sourcing.

4.2.3 Statements Tesla

Statements made by Tesla in the impact report are structured using the five themes. One of the five themes is not covered in the report and is left out.

Awareness of EU conflict minerals regulation and responsible sourcing

Tesla is committed to source responsible into their supply chain. Tesla makes sure that in their supply chains the working conditions are humane and safe. Lastly the manufacturing processes of products from Tesla are environmentally responsible (Tesla, 2019, p32). Tesla is not explicitly aware of the EU CMR, but they have a link to the Dodd-Frank SEC filing they made and discuss conflict minerals, 3TG.

Tesla has implemented a policy about conflict minerals and human rights to ensure they do not finance armed groups (Tesla, 2019, p34).

Transparency

The supply chain of Tesla consist of suppliers from all over the world. Raw materials are not directly obtained from the direct suppliers but from many tiers away. The suppliers are required to practice due diligence which helps in the transparency of the supply chain and determining the origin of raw materials (Tesla, 2019, p32).

Next steps forward

Third party audit and visits to the suppliers makes it possible to have insight in the operation of suppliers. Recycling is an important practice to reuse valuable materials over and over (Tesla, 2019, p26).

Circular economy & conflict minerals

Tesla has a recycling centre on the site of the Gigafactory in Nevada for recyclable materials (Tesla, 2019, p24). Metal scraps from the process of making parts of the cars cannot be recycled on site and are sold to recyclers local and international. Tesla is streamlining this process to make it even easier for recyclers to buy scrap and stimulate the reuse and recycling of materials (Tesla, 2019, p24). Tesla made a marketplace for parts which were no longer needed and other tesla teams could use (Tesla, 2019, p25). Tesla is working on a recycling process for the lithium batteries at the Gigafactory 1, to recover metals and other valuable materials. But currently, Tesla outsources the recycling till they have finalised their own process (Tesla, 2019, p26).

> "The closed-loop battery recycling process at Gigafactory 1 presents a compelling solution to move energy supply to a more circular model of recycling end-of-life batteries for reuse over and over again "(Tesla, 2019, p26).

4.3 Philips

This paragraph starts with an introduction of Philips. Followed by the detailed RSN analysis. Lastly interview statements are analysed about awareness of CMR and RS, positive aspects and limitations of CMR, transparency and the next steps to take.

4.3.1 intro of Philips

Philips was founded in 1891 by Fredrick Philips and this son Gerard Philips. They were both interested in science and engineering and developed electric light bulbs. (Philips, n.d.-a) Later the other son also became part of the company Anton Philips, he was responsible for the marketing of the products and together the brothers brought the light bulb, their first major product to mass market. They were able to combine technical insight with strong marketing. (NPO Radio 1, 2019). The "Nat lab A", physics laboratory for new technologies and innovation, made Philips a pioneering company. The second

famous product of Philips is the radio, this was the first electronic consumer product. In today's market Philips is leading in health technology through innovation (Philips, n.d.-a). They now have different products which can be divided into two sectors Healthcare and consumer electronics. Philips's goals is to improve the health and well-being of people through innovation. (Philips, n.d.-b)

The Healthcare sector of Philips generates 42% of the total turnover. Philips (n.d.-d). The total turnover of Philips in 2019 was 19,5 billion euros, with a profit of 1,2 billion euros. The number of employees is 77.400 with 11.500 employees in the Netherlands.

Philips produces sustainably, according to high ESG (Environmental, Social and Governance) standards. Philips has incorporated sustainability into their business processes. This is elaborated in the commitment to three sustainable development goals, namely SDG 3, 12 and 13. Philips (n.d.-c). Especially SDG 12 Responsible consumption and production is interesting because this SDG is also dealt with in this thesis.

Circular economy goals of Philips are progressive: for 2025 Philips want to have 25% of sales consist of circular products and services. Making sure that the loops are closed by exchanging all professional medical equipment and ensuring a responsible reuse and repurpose. At all Philips locations, not only the manufacturing plants, Philips aims for no waste to landfill and no non-circular practises (Philips, n.d.-c).

4.3.2 Due diligence rating Philips

Philips is analysed using the RSN grid. Five open data documents are used to complete the table, these documents can be found in Appendix 0. The documents consist of SEC filings for the Dodd-Frank act 1502 but also conflict minerals reports. Table 11 is elaborated in this subchapter and the text is divided per theme. The themes are risk mitigation, human rights impact and reporting. Themes are all subdivided into categories: strategy, risk assessment, risk mitigation, outcomes, engagement, alignment and transparency. In turn, the categories are subdivided into criteria.

Table 11 Detailed RSN Grid Philips

Theme	category	measurable statements		Total per category
RISK MITIGATION (60%)	Strategy (20%)	Conflict-Free Minerals Policy (10%)	10.0	20.0
		Policy Accessibility (2%)	2.0	
		Internal Management System (8%)	8.0	
	Risk Assessment (20%)	In-Scope Determination (3%)	1.0	15.1
		Response Verification (3%)	2.5	
		Describe the facilities where minerals are processed (6%)	3.6	

		Assessment ratios (3%)	3.0	
		Country of Origin (5%)	5.0	
	Risk Mitigation (20%)	Response to Risk at SOR level (10%)	6.0	12.7
		Supplier Risk Management (10%)	6.7	
HUMAN RIGHTS IMPACT (20%)	Outcomes (12%)	Conflict-Free Sourcing (5%)	5.0	6.4
		Company prevents embargo of conflict-free sources. (4%)	0.8	
		Identification and measurement of social outcome(s) (3%)	0.6	
	Engagement (8%)	Support of in Region Sourcing (3%)	1.3	5.0
		Support of in region Project (3%)	3.0	
		Participation in multi-stakeholder initiative (2%)	0.7	
REPORTING (20%)	Alignment (15%)	Continuous Improvement (5%)	5.0	13.0
		Implementation of OECD Step (6%)	6.0	
		IPSA (Independent Private-Sector Audit) (4%)	2.0	
	Transparency (5%)	Publicly Available Information (3%)	3.0	5.0
		Risk Assessment outside the disclosure (2%)	2.0	
				77.1

Risk mitigation

In the risk mitigation theme Philips earned the maximum score for the category strategy this means that Philips scores maximum for all the criteria: conflict-free minerals policy, policy accessibility and internal management systems. For the risk assessment category Philips earned the maximum score for the criteria' assessment ratios and country of origin. In the criteria of in-scope determination and the process facilities of minerals substantial improvement is possible. In the response verification only a small improvement is possible. The risk mitigation strategy category earned a sufficient score this means that in both the criteria: the response to risk at SOR level and the supplier risk management, improvements are possible.

Human rights impact

Philips earned the maximum score for the criteria conflict-free sourcing of the category outcomes. The other two criteria of the category outcomes score severely insufficient, so there is a lot of room for improvement here. This consist of practising the prevention of embargo of conflict-free sources and partaking in the identification and measurement of social outcomes. In the engagement theme Philips has a sufficient score. The support of in region projects earned the maximum score while the support of in region sourcing and participation in multi-stakeholder initiatives can be improved.

Reporting

In the reporting theme Philips earned a score of 18 out of 20. For the category alignment Philips scored maximum for the criteria continuous improvements and implementation of the OECD steps. Only for the independent private-sector audit criteria progress can be made. Philips earned the maximum score for the transparency category, both for the publicly available information and risk assessment outside the disclosure.

Overall Philips scores the strong label with a score of 77 out of 100, but there is still room for improvement. The most progress can be made in the risk mitigation category by giving support to SOR third party audits, support capacity building for SORs and to visit a SOR or supplier. Secondly other criteria which will greatly improve the score are in the outcomes' category of the theme human rights impact. The criteria prevent embargo of conflict free sourcing and identification and measurement of social outcomes can be improved by the stimulating of suppliers to stay sourcing from the DRC from certified conflict free mines and the control of employment and wages in the mining region.

4.3.3 Interview Philips

the interview was conducted with the supplier sustainability officer of Philips. The interview was held via skype. Questions were sent to the interviewee before the interview.

Awareness of EU conflict minerals regulation and responsible sourcing

The Philips sustainability officer acquired the knowledge about the EU CMR from public information, industry association such as the RMI as her daily work and contact with stakeholders. This information has not been obtained through the channels made available by the EU, which can lead to incorrect information. According to Philips responsible sourcing (RS) is an umbrella term, which includes both socially responsible and environmentally sustainable sourcing.

Implementation of EU CMR

Philips accepts that the EU CMR is broader with more areas included than the Dodd-Frank act. Due diligence schemes are approved as a guaranteed method by the EU. Limitations of the EU CMR appointed by Philips consist of limited mineral inclusion of only four minerals, soft enforcement actions have limited to no consequences and importers are solely responsible.

Transparency

Transparency in the supply chain would be the most important step towards RS (Philips). Company mindset on the business level and relationships with suppliers is important to create transparency in

the supply chain (Philips). Identifying risks is important, frequently risks in the supply chain are not visible. To gain visibility of the risks, we need to map the supply chain and acquire enough data from suppliers or other sources. We can then mitigate risk only after identifying the risk and assessing its priority (Philips).

Next steps forward

Philips argues that they have limited leverage and insight over upstream actors and therefore have to collaborate with industry members, government and civil society to increase the leverage to be able to source responsibly and support the development of the local communities and economy. Philips indicates that suppliers need to be engaged in the cooperation, trained on how to fill in the CMRt's and have good contact with the upstream companies. Research in the field of conflict minerals could provide a holistic view of existing work, provide data and theories. With an insight into these sources of information one can reflect on gaps and find ways to improve (Philips). The RMI is a good example of providing support to comply with due diligence. There are many standards of responsible sourcing and conflict minerals. It would be valuable to firstly conduct research about available standards and comparison, and to secondly provide a more harmonized version for the standards. This could be a preliminary step to compare and research existing standards (Philips). More transparency and traceability of the supply chain of possible conflict minerals can be provided by research. This could make it possible to improve the livelihood and conditions of the employees at mine sites (Philips).

Circular economy & conflict minerals

> "Responsible sourcing should be ensured even for the transition to a circular economy, which means in a circular economy responsible sourcing includes the ethical and sustainable sourcing of secondary (recycled) materials "(Philips employee, personal communication, May 27, 2020).

4.4 Stand-alone interviews without RSN analysis

This chapter contains two interviews from companies who could not be included because of the lack of public information or of the request to be used anonymously. While no RSN analysis is conducted the interview data can still be of value. Also, the absence of information is able to provide insight for this research. Starting with a short introduction of TomTom followed by the interview results. The next chapter describes the electric automotive company in short and closes with the interview results.

4.4.1 TomTom

TomTom was founded in 1991 by a group of four entrepreneurs. The goal of the company was to make a portable navigation system. When creating the first navigation system it became a consumer product with a high selling rate. TomTom shifted from the hardware to software and is now the leading location technology specialists Experimenting with solving challenges as autonomous driving cars but also reducing emissions, traffic congestion and road accidents (TomTom, n.d.).

The interview is conducted via mail where the questions were sent and the reaction is processed in the 5 topics as can be seen in the underlined headings. The questions are answered by the quality engineer of TomTom, hereafter referred as (TomTom, 2020)

Awareness of EU conflict minerals regulation and responsible sourcing
TomTom describes RS as a risk for the company and the selection of vendors as a form of RS.

Implementation of EU CMR
No comment was given in the statement by TomTom. This absence is also considered in the further analysis.

Transparency
The new law will be important for bringing more fairness to the electronics industry. The EU CMR offers an incentive for transparent sourcing and shows the world that this topic is high on the EU's agenda (TomTom,2020).

Next steps forward
No comment was given in the statement by TomTom. This absence is also considered in the further analysis.

Circular economy & conflict minerals
TomTom (2020) states that if downstream companies can provide insight as deep as possible in the supply chain, understanding every step, it could be possible to circle back. That would align with responsible sourcing and given this level of transparency positive effects can circle back into the companies activities.

> "Reaching the goal of responsible sourcing will inevitably be a joint effort of all actors in the field, including all companies across the supply chain, legislators, NGOs and researchers. While TomTom still plays a role in the supply chain relevant for the responsible sourcing of minerals, we will continue to ensure that our conflict minerals management meets the expectations of legislators and our customers" (TomTom, personal communication, June 19, 2020).

4.4.2 Automotive company

This automotive company produces electric cars and has sustainability and environment as a high priority according to published documents of the company. The interviewee is responsible for buying materials for the company directly.

Awareness of EU conflict minerals regulation and responsible sourcing
The Automotive company did not know what conflict minerals were and had not heard of the EU conflict minerals regulation, while the term RS was known by the company representative. The mindset of the company is important; should a product be cheap or should it be produced responsibly.

Implementation of EU CMR

No comment was given in the interview. This absence is also considered in the further analysis.

Transparency

Visibility of the supply chain would be the most important step. Understanding would come from a transparent supply chain and sourcing process. Relationships between suppliers is important, since suppliers are more willingly to talk to someone they trust.

Next steps

According to the automotive company research plays an important role in identifying any new high-risk areas. The mindset of the company and the relationship with suppliers is important for positive change.

Circular economy & conflict minerals

If a company understand every step of the production process it would be possible to circle back and as a result reuses and recycle materials.

4.5 Results: Comparison awareness and transparency

Table 12: Results from the RSN grid.

Theme	Category	Fairphone	Tesla	Philips
RISK MITIGATION (60%)	Strategy (20%)	20.0	17.5	20.0
	Risk Assessment (20%)	19.5	7.2	15.1
	Risk Mitigation (20%)	14.3	6.7	12.7
HUMAN RIGHTS IMPACT (20%)	Outcomes (12%)	10.2	3.9	6.4
	Engagement (8%)	6.0	0.7	5.0
REPORTING (20%)	Alignment (15%)	11.3	13.0	13.0
	Transparency (5%)	5.0	2.0	5.0
Total score		86.4	51	77.1

Table 12 combines all the results from the RSN Grid to be able to compare the companies with each other and the RSN results of 215 companies. According to the rating from table 12 Fairphone scores best on the theme risk mitigation but also on the theme human rights impact. For the Reporting theme the alignment category is scored the same by Tesla and Philips while Fairphone and Philips have the same maximum score for the transparency. Comparing between the performance categories from the

RSN and the three case study companies see figure 10. Fairphone has the best rating with a score of 80+, Philips score a performance category of strong with a score of 70+. While Tesla must do it with a lower score of adequate.

Awareness is difficult to extract form the RSN grid. But when selecting the companies not all companies had a due diligence report or SEC filing. This could show that the awareness of these 18 companies about due diligence is low with only 37% have a due diligence report or SEC filing. Transparency For the companies who have a RSN rating is high. Both Fairphone and Philips score the maximum score. The combination of the data structured per theme is shown in table 13 and gives an overview of the data used.

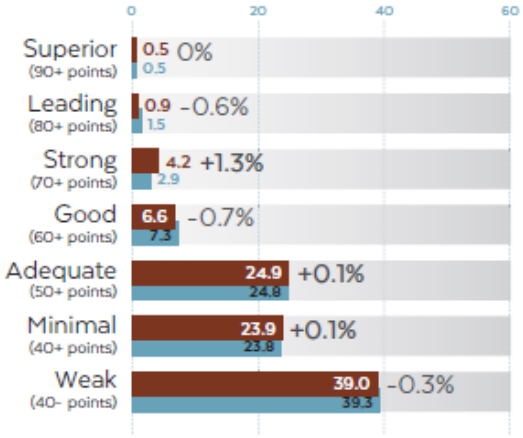

Figure 10: Percentage of sample companies by performance category for 3TG Due Diligence RSN(2019)

Table 13 combines all the statements per theme made by the companies in the interviews or the public statements used.

Themes	Company	Statement about theme
Awareness of EU CMR and RS	All	3/4 have heard of EU CMR, but who is mandatory is not clear
	All	RS is not clear, because all companies have different definitions
	Philips	Transparency in the SC is the most important step towards RS
Implementation	Fairphone	EU CMR is a stepping stone but more is needed for RS
	Philips	EU CMR is broader than the Dodd-Frank act with the CAHRA's.
	TomTom	The EU CMR will bring more fairness to the electronics industry.
	Philips	Only 4 minerals, enforcement actions and importers are responsible.
	Philips	Due diligence schemes are approved as a guaranteed method by the EU
Transparency	Philips	The RMI is a good example of providing support to comply with due diligence and creating transparency

	TomTom	The EU CMR brings an incentive for transparent sourcing
Next steps	Fairphone & Philips	Collaboration between stakeholders
	Philips	Analysis of available standards and comparison, provide a more harmonized version for the standards
Circular Economy and conflict minerals	Philips	The Circular economy should include responsible sourcing the ethical and sustainable sourcing of secondary (recycled) materials
	TomTom	If Downstream companies understand every step in their supply chain they could circle it back

5.0 Stakeholder interviews

The results are divided per stakeholder sector: governance, academic and civil society. The themes from the analyses listed in table 7 are used to structure the sub subchapters. All the results from the interviews are summarized and are displayed in table 14.

5.1 Table of results

The summary of the results of the stakeholder interviews are gathered in table 14 and is shown below. With the letters G, A and C the stakeholder sectors are represented. G stands for the governance, the A stands for the academic and the C stands for the civil society stakeholder sector.

Table 14: Stakeholder interviews combination of all stakeholder sector.

Awareness	G	RS becomes more mainstream in government (Advisor, 2020)
	A	Already 3 years ago announced (Young, 2020)
	G	Improve the provision of information or to identify the risks (Maiotti, 2020)
Responsible sourcing	G	More mainstream within the governance
	A	RS is probably a company level action (Young, 2020 and Brink, 2020)
Due diligence challenges	G	New for the inspection who is responsible for the enforcement (Advisor, 2020)
	G	Due diligence exercise for the very first time (Maiotti, 2020)
Implementation	G	Everyone is responsible also the end users, whom it is voluntary and for whom it is compulsory (Koch, 2020)
	C	EU should look better at the Dodd-Frank act 1502 (Deberdt, 2021)
Positive aspects of EU CMR	G	no scare effect, the global scope and that a risk-based approach (Koch, 2020)
	A	Broader than the Dodd-Frank
Negative aspects of EU CMR	G	Only 4 materials, low sanctions, easy to interpret by member states and possible to circumvent (Koch, 2020)
	A	Only the importer is responsible, and only 3TG is included
Limitations of	G	Customs not possible to reveal the importers (Koch, 2020) & Breaks into habits companies (Advisor, 2020)
	A	Sunshine regulation, Low phasing-in time (Youn, 2020)

EU CMR	G	Review clause (Koch, 2020) & Inspection new to due diligence (advisor, 2020)
	A	Confusing what is covered in the regulation (Youn, 2020)
	C	Different authorities across the EU are enforcing the regulation creates inefficiency (Deberdt, 2021)
Transparency	G	More transparency needed of governments (Koch, 2020)
	G	Traceability and transparency cannot be an objective per se (Maiotti,2020)
	A	Create more transparency (Young, 2020)
Largest obstacle of the EU CMR	G	Capitalist system (Koch, 2020) and extra time for companies (Advisor, 2020)
	A	Achieving transparency (Young, 2020)
Next step	G	Join multi stakeholder initiatives (Koch, 2020) & orientate on everything already offered (Advisor, 2020)
	G	Research on implementation (Koch, 2020) & The inspection is changing into more innovation and new technology (Advisor, 2020)
	A	Certification of the supply chain can bring more insight in the supply chain (Brink, 2020)
Circular Economy and conflict minerals	G	Gold promotes with circularity (Koch, 2020), not mined again (Advisor, 2020)
	A	It is interesting to see how the European regulation intersects with other requirements (Young, 2020)
	A	Circular economy and conflict minerals have the same building blocks (Young, 2020)

5.2 Governance results

For the governance sector, three important stakeholders were interviewed from different positions within the government and an advisory position for the government. All the important stakeholders will have a short introduction after which the results are described. Dirk Jan Koch, hereafter referred as (Koch, 2020), was working for the ministry of foreign affairs in the position of special envoy to natural resources for the Dutch government. The second interviewee is an advisor, hereafter referred as (advisor, 2020), for the government working on the implementation and application of the CMR. Luca Mailotti, hereafter referred as (Mailotti, 2020), is the third interviewee for the governance sector. He is working for the OECD as a policy analyst of responsible mineral supply chains.

Awareness of EU conflict minerals regulation

For the EU CMR all parties involved in the supply chain are responsible. The idea of the regulation is that everyone shares responsibility, also the end-users. The distinction between stakeholders is whether it is voluntary, or it is compulsory. It is mandatory for importers who are audited, since they operate at a kind of choking point that can contribute to solving the problem (Koch, 2020).

Responsible sourcing

RS is getting more ordinary and connected with responsible procurement for public procurement procedures for the government (Advisor, 2020)

> "Responsible procurement has now become more normal and mainstream. Government is identifying the potential of responsible procurement. "(advisor, personal communication, July 14, 2020).

Due diligence challenges

A challenge for the inspection who has to enforce the EU CMR is that due diligence is something they have not worked with before. Therefore, the inspection is working on new methods to assess due diligence for conflict minerals. New inspection methods to examine due diligence systems, management level and remote supervision are being developed. (Advisor, 2020)

There are large companies who state that they practise due diligence while in reality the quality of this due diligence is unknown. It is important to check the due diligence of companies. The OECD incite companies to ask for advice from stakeholders who can support the due diligence (Maiotti, 2020). For specific risks companies need to work with their suppliers and improve the issue within a feasible timeline and demonstrable developments (Maiotti, 2020). Extra attention for artisanal and small-scale miners; they are vulnerable to external economic impacts. Companies need to embrace the quality and robust execution of the guidance. Engagement is the first step and secondly working together by making easy and small improvements within a reasonable time frame which will lead to gradual improvements in the supply chain (Maiotti, 2020). The OECD Minerals Guidance is a tool for prioritizing the most serious adverse impacts, providing practical recommendations (Maiotti, 2020).

> "The challenge is to improve the provision of information to identify the risks, and to report on how the risks have actually been mitigated " (L. Maiotti, personal communication, June 03, 2020).

Implementation

While the EU CMR is not implemented lessons can be learned from earlier implemented regulation concerning conflict minerals. As a result of the Dodd Frank act, more traceability systems were implemented for tin and tantalum. There was a clear reduction of the presence of armed groups in the mines of tin and tantalum what is a great success of the Dodd Frank (Young, 2020). According to governance interviewee advisor It is too early to say whether the new regulation have positive or negative aspects. It has yet to be implemented.

"There is research needed on the implementation of the EU Conflict Minerals Regulation" (advisor, personal communication, July 14, 2020).

Positive aspects of EU CMR

There are numerous positive aspects of the EU CMR namely: the avoidance of backlash, the global scope, the review clause and the consent to regulation. These positive aspects are explained by some examples. The long phase in time is included in the EU CMR to avoid a backlash. A backlash has arisen in America with the Dodd-Frank act in a kind of revolt and pushback. Because of the long phase in time there will be no scare effect because the EU CMR is already well known (Koch, 2020). The scope of the regulation is wider than the Dodd-Frank act who only focuses on the scope of the Demographic Republic of Congo (DRC) (Koch, 2020). The review clause in the EU CMR was an important bargaining point, because now the regulation can be adjusted in time, expecting to become more (Koch, 2020).

Negative aspects of EU CMR

There also a few negative aspects of the EU CMR including; low sanctions for non-compliance with rules, every member state being able to interpret the regulation as they see fit. Lastly the regulation make it possible to work with non-EU importers through which the EU regulation can be circumvented. These agreements were needed to compromise to be able to make a legislation for the whole EU (Koch, 2020).

Limitations of EU CMR

Two of the limitations of the EU CMR are that the ministry cannot make public which companies are covered by these regulation and the restriction to only 4 minerals 3TG. These two limitations are explained by two examples. The Ministry cannot disclose which companies are covered by these regulation. This data is collected by customs and the data from customs is secret, which is why there cannot report on it. The Ministry knows that there are up to 100 companies covered by the law (Koch, 2020). The choice for the 3TG is made because of the risks that these have the most risks of being involved in conflict and because of the of specification of the Dodd-Frank act to those four minerals (Koch, 2020).

Transparency

Transparency is described in two different examples, the first explains the missing transparency of the government toward the public. Secondly the transparency and traceability about gold is explained. The government has to be more transparent about the information which organisations are subject to the EU CMR. The government themselves will have to be more transparent in order to make the civil society research more detailed and extensive. The researchers and civil society have an important role to play but do not always succeed because they do not have enough data about the organisations who are subject to the EU CMR (Koch, 2020). Within the gold sector in the Netherlands there is little enthusiasm to get more traceability in the supply chain (Koch, 2020). Gold has high value for a low quantity, this makes it easy to smuggle (Koch, 2020). Transparency and traceability in the supply chain is preferred, but it is not an objective. Information collected through traceability must be used. The focus from transparency and traceability need to be shifted towards due diligence to analyse the information that is collected through that system. The system as a whole is very important and the system is a management process to do due diligence (Maiotti, 2020).

> "transparency system can not only be about traceability, most of the companies want to have complex electronic blockchain transparency systems, but all system is as good as the information you put in" (L. Maiotti, personal communication, June 03, 2020).

Largest obstacle of the EU CMR

According to the governance interviewees there are two main obstacles of the EU CMR, the capitalist system and the change companies have to make. The largest problem is the capitalist system, what can be seen is that the system forces consumers to buy products at the cheapest possible cost. This makes that companies want to produce for the lowest costs (Koch, 2020). Companies are not willing to change their way of doing. It breaks into habits, a company has working methods, certain processes and these are only tailored to due diligence to a limited extent (Advisor, 2020). Many downstream companies experience challenges doing due diligence for the first time because of the complex supply chains. (Maiotti, 2020). Industry initiatives do have audit standards that translate the guidelines into a set of checklist questions to know whether the smelters and refineries have the management systems in place to carry out due diligence (Maiotti, 2020).

> "There is also the inclusion of artisanal and small-scale mining. One challenge for companies is a quality and robust understanding of the Guidance to embrace the complexity of artisanal small scale mining. This means be willing to engage by starting small and easy, provide measurable and realistic timelines for improvements and work progressively to formalise production in the supply chain" (L. Maiotti, personal communication, June 03, 2020).

First and next steps

The first step to complying with the EU CMR is to look into everything already created for this regulation by initiatives and multi-stakeholder collaborations. Companies have to educate themselves well on everything that has already been created. There are so many initiatives and support available. The OECD has all kinds of useful material, on national and international platforms that offer information. Companies have to orient themselves well and go for the kind of information flows that are already widely available (advisor, 2020). It's important that companies join multi stakeholder initiatives. These bigger companies have plenty of resources, so this should not be a barrier (Koch, 2020). Cooperation is key, downstream companies are many tiers away in the mineral supply chain and have 40-80 different smelters for one mineral. Industry associations have experience in facilitating dialogue and mapping the supply chain. The RMI has templates for suppliers' letters that they have provided with templates that the supplier must declare and have to correspond to the OECD guidelines (Maiotti, 2020).

Next to there are assurance companies for example the international tin association, supply chain initiative and responsible jewellery council, the London bullion market association, being on the good delivery list, on the list of the good refiners and responsible minerals initiative. Audit and are part of this will ensure a company to be able to sell on the London metal exchange, and do business with the downstream market (Maiotti, 2020). These initiatives check the conformity of OECD guidelines. In

advisor019, they carried out an assessment of the alignment of industry initiatives checking individual companies, their standards, if they are in line with the performance of the OECD guidelines. Interesting exercises they all compare with these and the OECD guidelines, as an indicator. Rather surprising was that all these companies claimed to be in line with the OECD guidelines, what in reality was low. There was a pilot to use the alignment assessment methodology to audit the industry organisations that are going to audit the companies (Maiotti, 2020).

In the OECD companies who have already undergone an audit of some standards do not have to demonstrate to the EU regulation if the standards are vetted by the EU. To be able to do the vetted the EU commission use the alignment assessment tool (Maiotti, 2020).

Circular economy and conflict minerals

It has been observed that companies are looking currently more at the supply chains, especially at security of supply, this could be because of the corona crisis. There is a push to increase security of supply through circularity (Koch, 2020). The gold sector prefers to recycle, consumers hand in a gold ring and the jewellery shop turns it into something new. For a new phone, phone companies can use the materials from an old phone. This is also more sustainable so there is a justified tension. Companies put a lot more effort in to become circular, than the effort to become more responsible towards social or environmental issues. This is also a marketing strategy (Koch, 2020). One doesn't rule out the other, new material is always needed for the energy transition for example (Koch, 2020). For a responsible circular economy, it is very important that the history of the materials is known. It is also very much about the sparse minerals and other products used in industry, especially in electronics (Advisor, 2020).

> They prefer to present themselves as 100% circular, hand in your old cell phone with nice images of clean factories that sell better than dirty mines in eastern Congo. People don't really want to know that's where the stuff comes from. I think companies are more difficult to mobilize for due diligence in the chain than the circular economy (D.J. Koch, personal communication, June 10, 2020).

5.3 Researchers results

Research on conflict minerals is growing but not a lot of researchers are researching these problems. Two interesting researchers are interviewed and are introduced. Steven B. Young, hereafter referred as (advisor, 2020), is an associate professor in the school of environment, enterprise & development at the University of Waterloo, Canada and educated as an industrial ecologist. Susan van den Brink, hereafter referred as (Van den Brink, 2020), is an PhD student in the department of industrial ecology, institute of environmental sciences at Leiden University, the Netherlands. Her research includes the certification of raw materials project where certification schemes ensure social, environmental and economic sustainability in the whole supply chain.

Awareness of EU conflict minerals regulation

The researchers argue that the EU CMR have been announced 3 years ago, which gave companies enough time to be aware and prepare for the regulation (Young, 2020).

> "Awareness can be increased through media and research. Reports from NGOs and the media play an important role in putting the topic on the map "(S. Van den Brink, personal communication, June 16, 2020).

Responsible sourcing

There is tension between the action of responsible sourcing. RS is a company level action, but it is not clear if authorities are going to regulate on RS. In the end the voluntary action will nudge the companies to do more responsible practise (Young, 2020). It reinforces an international expectation on responsible sourcing, at least for tin, tantalum, tungsten and gold.

Due diligence challenges

The due diligence requirements for companies are voluntary what makes it difficult to act on in for inspection (Van den Brink, 2020).

Implementation

Companies use the same tools, standards, auditor policies and reporting. There is a value in comparing different minerals across different companies and across different sectors. There is a motivation, the popularity of sharing is increasing. The NGO ratings, it is a jumble, most of the companies are doing the same thing, but they just report differently. They all use the same databases of suppliers they're using the same auditors, and they're using the same standards. The companies are already sharing information (Young, 2020). Large companies are much more accessible than small companies. It is easier for large companies to put pressure on suppliers because they make large purchases. Large companies are able to choose their own suppliers more than small companies are dependent on certain suppliers, which really makes it more difficult (Young, 2020).

Positive aspects of EU CMR

Positive aspects of the legislation are: according to researcher 1 the EU legislation is broader on the term conflict minerals where the Dodd frank only describes it as violations while the EU regulation describe it broader as human rights violation and child labour (Van den Brink, 2020).

Negative aspects of EU CMR

Negative aspects of the EU CMR the legislation only focuses on 3TG and not on all materials. (Van den Brink, 2020). Besides the regulation is only about importing raw materials and not about semi-finished goods. This has led to a lot of products first going to China and other countries for manufacturing the semi-finished goods (Young, 2020). Industry complaints have been received by researchers that it is too complicated because of the manner in which it is only the importer who is regulated while a designer or a manufacturer does not have the same requirements (Young, 2020).

Limitations

Banning and boycotting strategies from a consumer side is not a way to go (Young, 2020).

A more nuanced social understanding is important in describing conflict minerals. The goal is to solve the human rights violation but to keep in mind not to impoverish the local mining community with all the regulation made in the first world. Does the regulation help solve the problem or do the downstream companies show that they do not use conflict minerals, but the use is shifted to less sophisticated companies in other continents (Young, 2020).

> "The sophisticated corporations and the more sophisticated initiative are saying let's look where everything is coming from but also let's do some actions in those regions" (S. Young, personal communication, June 03, 2020).

Transparency

For a responsible supply chain, it is essential to know where the minerals are mined and refined. Companies use templates provided by the responsible mineral initiative, RMI. Companies send questionnaires to suppliers in order to map out where the minerals come from and to analyse potential risks. (Van den Brink, 2020). Not all downstream companies have this type of transparency in their supply chain (Young, 2020). Small companies can hardly put pressure on suppliers to give information because it is confidential information. Large companies are already trying to become more transparent (Van den Brink, 2020). More transparency over the supply chain can be achieved by the traceability via certification schemes. Besides the traceability of minerals also the sustainability of a supply chain can be measured via certification.

Largest obstacle of the EU CMR

Both researchers describe transparency as the largest obstacle for a responsible supply chain (Young, 2020; Brink,2020). First companies have to understand the supply chain of the upstream midstream and downstream. The downstream companies do not have visibility where most of their materials come from. Original equipment manufacturers have struggled to engage one tier into their mineral supply chain (Young, 2020).

First and next steps

The first step towards a sustainable supply chain is the transparency and traceability of the supply chain. To ensure this, a chain of custody certification is used where every step is certified and thus guaranteed that the material comes from that mine. Also, blockchain technology and analytical fingerprint methods are interesting methods to use for certification (Van den Brink, 2020). A sufficient way for certification is the Craft go allegiance of responsible mining (ARM), that is bringing small scale mining into contact with the companies downstream. They created an open-source standard that can be used by any certification organisation. It is based on the due diligence they comply with the OECD due diligence guidance. It is made in such a way that companies know that it meets the requirements, and it aims to connect the upstream artisanal miners with downstream companies (Van den Brink, 2020).

"Research is particularly important to look at what is happening locally in mining. What is the impact of legislation on local problems. The aim is to reduce or at least not aggravate the problems with this law" (S. Van den Brink, personal communication, June 16, 2020).

Circular economy and conflict minerals

Circular economy and conflict minerals have the same building blocks the following can be observed namely; the understanding of where products are made, the understanding of where they are and the understanding of where they are going. If isolated the issue and look at the flow of information in the databases the decisions that companies are making about sourcing or procurement or design or engineering. These actions are very similar for the circular economy improvement as they are for due diligence or conflict minerals improvements. The conflict minerals tend to be more management-oriented and require more sophisticated assessments of social, legal and labour issues, in comparison, the circular economy assessment is more technical. There is a lot of overlap between Circular economy and conflict minerals (Young, 2020). Circular economy can be focused mainly on recycled materials, which is currently an important topic. There are projects to see how minerals can be recycled in a better and cheaper way. Minerals from recycling are outside the scope of the European conflict minerals legislation. However, society is still far from being able to recycle everything thus it is still necessary to source minerals from mining, which further reinforces the importance of mining becoming more sustainable (Van den Brink, 2020).

"I think it is interesting to try and connect the dots between environmental foot printing, climate change, circular economy, waste management and conflict minerals" (S. Young, personal communication, June 03, 2020).

5.4 Civil society results

For the civil society only one interesting stakeholder is interviewed twice, Raphael Deberdt, hereafter referred as (Deberdt, 2019) or (Deberdt,2021), Deberdt is working for the responsible sourcing network as minerals program associate. He is lead researcher and author of the 'mining the disclosure' publication.

Awareness of EU conflict minerals regulation

Deberdt knows that the EU conflict minerals exist and that is a regulation made to tackle conflict minerals, but not the details (2019).

Responsible sourcing

Responsible sourcing consist of both social and environmental components (Deberdt, 2021).

Due diligence challenges

Some companies check and audit till the smelters and refiners. They transfer the responsibility to the smaller smelters and refiners to audit the supply chain till the mine (Deberdt, 2021).

Implementation

The EU regulation should look at how the Dodd-Frank 1502 acts is doing and not to make the same mistake as 1502. For companies, it is not clear how they have to report on conflict minerals (Deberdt, 2021).

Positive aspects of EU CMR
A positive aspect is that the EU finally implements a regulation concerning conflict minerals.

Negative aspects of EU CMR
The EU CMR lay the responsibility at the importers, as a result most companies will not be directly impacted by this law (Deberdt, 2019). It is disappointing to see that the regulation are deployed at a low level with only 3TG if the EU wants to include more minerals this can create more uncertainty specially if the regulation is not completely implemented yet. This can create reasons for mainly small companies not to comply with the regulation (Deberdt, 2021).

Limitations
Different authorities in each country of the European Union are responsible for enforcing the regulation, which leads to inefficiency. One authority across the EU should enforce the regulation for clarity (Deberdt, 2021).

Transparency
Only eight companies with no SEC filling are rated for a reason because not a lot of companies file a due diligence or conflict minerals report if they are not forced to do so (Deberdt, 2021).

Largest obstacle of the EU CMR
Most employees of companies want to comply with the Dodd-Frank act 1502, but the finance department holds this up (Deberdt, 2019).

First and next steps
The EU should make a clear template, this would make it as easy as possible for companies especially small and medium size companies to comply and report on the regulation (Deberdt, 2021).

Circular economy and conflict minerals
interviewee did not have knowledge on this topic.

5.5 Summary of results experts

In summary as displayed in Table 14, Awareness is high among the stakeholders, of course, because they are directly involved in the various sides of conflict minerals in their work. Views on certain topics are divided where RS has been considered as a company level action, the governance sector advocates a responsibility that runs through the entire supply chain. The sectors correspond to the positive aspects of the EU CMR that the EU CMR is broader and more inclusive than the Dodd frank act. Also, on the negative aspects of the EU CMR a similarity is visible multiple interviewees indicated that the four minerals are very minimal. In addition, several respondents agree that more transparency is needed in the supply chain an important note is that traceability and transparency cannot be an objective per se the reason for traceability and transparency must not be forgotten. Lastly academic

mention that CE and the EU CMR have the same building blocks, and they are interested to see how the EU regulation intersects with other requirements. Figure 11 illustrates the influence of all the sectors with each other. The civil society puts pressure and input on the governance. The civil society provides help and tools for industry and at the same time put pressure on the industry. The relation between civil society and academia is shallower in connection with civil society, Civil society can provide input for research and the academia can give clarification towards the civil society. Academia can provide clarification for industry and advise for governance. Governance creates policies and guidance for the industry and the industry provides reporting and compliance with the government of its enforcement bodies.

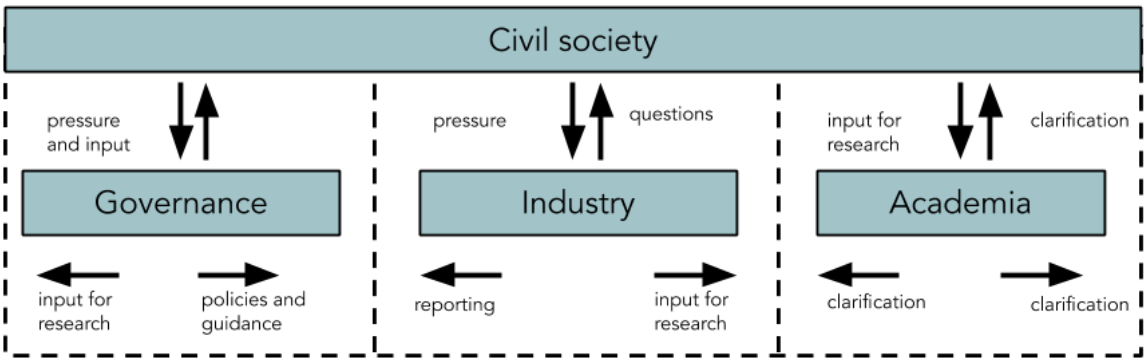

Figure 11: Relations between the sectors

6.0 Discussion

In this chapter the research is discussed in the following sub-chapters: Theory, method, limitations, relevance and the scientific contribution.

6.1 Discussion about the theories used

The theories used in this thesis are discussed in this chapter. This consist of the quadruple helix theoretical framework. The quadruple helix is discussed in three phases. Which part of the theory was applied correctly, which part was not applied correctly (areas of improvement) and which part could not be applied correctly.

The quadruple helix is an appropriate approach for this thesis as there is a need to incorporate all the stakeholders in the system. The quadruple helix allows one to connect four sectors, governance, industry, academic and civil society, with each other. This is considered as an innovative approach. It is applicable because of the stakeholder perspectives and institutional regulation are combined in one theory. The framework is very applicable to this thesis and made it possible to structure the four different sectors. In the interviews all the different viewpoints of the stakeholders were processed and analysed to capture the interactions between the sectors.

During the interviews the sector civil society and media was only considered for the former of the two. This meant that interactions between media and the other sectors were not captured in the interview data and was mostly derived from statements made by NGO's. Correct application of the quadruple helix theory also considers the media and its role in the ecosystem. The derived relations between media and industry, governance and academia have not been verified by the data, however,

publication made in the media by the other sector's stakeholders are considered in the case studies. The objectivity of these publications is enforced by European regulation limiting the impact of having no interviews with media stakeholders.

The quality of the outcomes of this research is based on the data that is put into it. The following challenges were faced due to limited time and resources: The interview data has an unbalanced representation between the four sectors. For both the industry sector and the academic sector two interviews with stakeholders were conducted. From the governance sector three stakeholders are interviewed, while from the civil society sector only one stakeholder is interviewed. This is mainly due to differing response to invitations to interviews.
Another challenge was the lack of overall knowledge in companies, which is presumed by Carayannis and Campbell (2009) at a local company level. Most likely as a result of newness of the CMR, some interviewed company representatives were not sufficiently educated on CM and RS. This lack of knowledge could very well lead to misrepresentation of the industry sectors in the data gathered from their answers. Given more time and resources proper follow-up of these interviews could greatly benefit the representation of industry in this research. Simultaneously, the lack of homogeneous knowledge was considered an important outcome of the interviews.

6.2 Discussion about the methods used

Considering that this research is exploratory in its nature, identifying the boundaries for a feasible analysis was challenging. This has been achieved by extensive research in literature and other background information.

Literature background method

The Wolfswinkel method makes it possible to simply select literature using keywords. This literature creates a background for the research using keywords as conflict minerals, governance law or regulation, corporate social responsibility, responsible sourcing, sustainable supply chain management, sustainable development goals and circular economy. Change of keywords was difficult to incorporate in the Wolfswinkel method and therefore the method was performed twice. The unused literature had to be removed from the table made with the Wolfswinkel method in the second pass.

Case study method

The case study made use of the rating system designed by RSN. This structure was chosen as it is a recently developed structure which uses open data to do an assessment of the due diligence of a company. The downside of this method is that it was implemented for the Dodd-Frank act and focused only on DRC and the adjoining countries. It is difficult to score 100 points because in the engagement section, 10 different associations and initiatives are named, and it would be rare for a company to have joined them all; this is also a quite unnecessary requirement because almost all associations have the same methods and goals.

Stakeholder interviews

Stakeholder interviews are conducted to be able to validate and generate extra data concerning the EU CMR. Because of the not yet implemented regulation most stakeholder could say little about the implementation process. They spoke about expectations and necessary changes but also about the difficulties of an EU regulation with the agreement of all the member states.

Thematic analysis

A thematic analysis is used to analyse the interview data. Code and themes are made and developed during the research. Themes are used for the overall meaning and the codes are used to divide the text in statements which say something about the code. They are all listed in the results. For the thematic analysis the program Atlas TI is used while it also could have been Excel. However, the program Atlas TI made it more convenient to code, change codes and make themes.

6.3 Limitations of the thesis

For this research different limitations have been encountered they are highlighted in this chapter. Including personal limitations, validation and limitations based on time and scope.

Personal limitations

Considering the qualitative research the interpretation by the researcher is important, in this respect, bias is unavoidable. Bias is created by assumptions and personal feelings for the subject. To try to minimise bias theories as well as objective methods were used.

Personal knowledge and experience of doing research, more specifically in the research field of stakeholder theory, was limited. The research method applied in this thesis was unfamiliar to me beforehand.

Validation

One limitation was the number of companies who have been rated by the RSN grid. Only two interviews with the industry companies resulted in specific information but not enough to generalise the information. With more companies a more complete picture could have been created and the information gathered could have been generalised and more conclusions could have come up. Now only company specific statements can be made.

Limitations based on time and scope

During this research it was difficult to get in contact with companies. This could be because of the focus on the corona situation and as a result a focus on activities with short term financial return, due to financial pressures arising from the C19 pandemic. The limitations are thus created by time restrictions, scope and current situations. The focus on Amsterdam gave a limitation since companies were excluded from the research as they were not based in Amsterdam. Few case companies are used which is very unfortunate, as a result of which wider cross case comparisons were restricted and the results and answers to the research questions are limited in scope and scale.

6.4 Relevance of thesis

The case study of this thesis is valuable, because it collects in depth data about a system, analyses the connections, and in this way can either confirm existing theory, or contribute to the development of new theory.

The existing regulation regarding CMR are rather complex and each include different aspects of CM and handle varying definitions of responsible sourcing. This research creates an overview of these differences, which is essential for assessing and increasing the impact of the regulation. For the government this could help to improve or tighten the regulation.

The concepts of awareness and transparency have been shown to be particularly relevant for issues related to CMR. This thesis has shown that there is room for improvement in terms of increasing the awareness and transparency around CMR.

The results from interviews are all a different piece of the puzzle because they all look at this conflict minerals problem from their own perspective. This thesis gives an overview on how different groups are involved. The people in Industry observe from their own companies and how they could improve. The government has two perspectives; on the one hand the policymaking side of the EU commission and how this could be improved over the next years. But on the other hand the enforcement through the local government of each country of the EU. Where agreements exist but not a script on how to implement, leaving lots of room for bad interpretation. The civil society is looking, asking questions, rating companies on their due diligence and helping organisations to comply. The academia take a step back from the problem and find certification methods and connection with a broader field. All together all those views are needed to come to a solution that fits all. The insights gained from the in-depth study of Amsterdam businesses and their relation to EU CMR can be used to further measure and assess the impact of EU CMR.

The EU CMR is mandatory requirements for importers, and has voluntary requirements for downstream organisations. For compliance with these voluntary requirements it is essential for downstream companies to take up responsibility. There is pressure from civil society on companies to take up this responsibility, however, it is not yet clear if companies will do this based on this pressure. Further, it is questionable if they are even able to simply adapt their current practices given the complexity of supply chain due diligence concerning conflict minerals. A better overview of the problem and impactful measures may be required for companies to improve their management of conflict minerals.

6.5 Scientific contribution

The scientific contribution of this thesis consist of the use of the quadruple helix in another domain. Secondly the use of the RSN grid for the EU CMR. Thirdly the inconsistent term RS in the EU CMR. Lastly the connection between the EU CMR and SDGs demonstrate similarities in order to strengthen each other.

<u>Quadruple used in another domain</u>

The thesis is not aimed at doing an evaluation of the quadruple helix in the domain of conflict minerals and responsible sourcing but rather aimed at applying the quadruple helix to better understand RS and CM in light of the new CMR. The novelty of this application will lead to a greater understanding of the theoretical framework as an indirect effect.

RSN can be used for assessment of the EU CMR

This thesis is a first test round of assessing if the RSN grid can be used in the EU. Generally, due diligence is an abstract concept which cannot be assessed easily. However, applying the RSN grid to companies in Amsterdam illustrates due diligence of companies and enables their comparison.

Inconsistent term RS in the EU CMR

In the EU CMR the term Responsible Sourcing is described by the OECD as the combining of the social and environmental aspects of sourcing. In practice however the OECD and the EU in the CMR, RS is focused more on the social aspect. This thesis seeks to highlight that the EU CMR is not precise about which terms they use and it does not explain in sufficient detail the meanings of terms. This is important in terms of clear communication and understanding of the EU CMR.

Bringing EU CMR and SDGs together

While the EU CMR focus on the social problems of conflict minerals, the SDGs combines the social factors with the environmental factors. The combination of the two helps to understand the underlying problems and are then easier to solve together. Where there is more transparency more can be done to create a supply chain without human rights violations and environmental damages. This thesis has established that, mandatory sustainability reporting for consumption and production companies, will align the company reporting structure in the CMR with SDG 12

CE partly solution for the CMR problem

Implementing CE could not entirely eliminate the need for the mining industry because there are always more minerals to be mined, because of the time materials are stored in products. This thesis has however, made it clear that the scope of the EU CMR not including recycled 3TG will stimulate the CE of possible CM. The recycled 3TG minerals can be more directly controlled by companies as the supply is. shorter and thus clear.

7.0 Conclusion

This study answers the research question ‘’**How can companies and governance implement of the European conflict minerals regulation 2017/821?’’** by means of three sub-questions, each answered in their own paragraph. In chapter 6.4 the main research question is answered. The last paragraph of this chapter recommendations are proposals for future research and next steps stakeholders can take towards a more fair and sustainable future.

7.1 Sub question 1 – EU CMR and responsible sourcing

In this section the first sub question is answered: **How does the European conflict minerals regulation 2017/821 relate to responsible sourcing?**

This question has been addressed by analysing existing regulation and literature concerning RS. According to literature RS includes social, environmental and economic aspects, while the EU conflict minerals regulation 2017/821 focuses on the economic and social side of RS including social harm, human rights abuse and conflict. The environmental aspects of RS are not specifically mentioned. The EU CMR refers to the OECD guidance for the definition of RS, yet the OECD does not give a clear definition. The OECD primarily targets social problems, but the OECD Minerals Guidance does not explicitly exclude environmental risk, it is a tool for prioritization for some of the most serious adverse impacts.

Concluding, RS in literature is defined differently than in the EU CMR or the OECD guidance. In literature RS is economic, social and environmental phenomenon, while in the OECD guidance and EU CMR, RS is defined as a social and economic phenomenon. The effect of these differences is that environmental is excluded from the EU CMR.

7.2 Sub question 2 – Awareness and transparency of EU CMR

What level of company awareness and transparency is present with regard to the European conflict minerals regulation 2017/821? This question is split in two questions with two answers, the company awareness of the EU CMR and the transparency of companies about their due diligence of the supply chain.

<u>Awareness</u>

Awareness of the regulation is the first step for compliance with the conflict minerals regulation. It is crucial for companies to know what they have to comply with. The present case study reveals that companies tend to be aware of the regulation in a general sense. However, even though most the companies knew of the regulation, the awareness was not widespread through the organisations.

<u>Transparency</u>

In companies, creating transparency in the supply chain is motivated on the one hand through the need for providing it to customers and investors, but on the other hand not wanting to contribute to conflict or to prevent human right abuse. This can be divided in two main aspects; the transparency of the companies towards their consumer and transparency into the supply chain. Certification is a tool for more transparency in the supply chain, which can be employed by blockchain, chain of custody and trace elements. The transparency is all about the data which is made available by the technology and not about the technology itself.

If a supply chain is transparent applying of due diligence is straightforward. The risks are clear and the due diligence is how to manage these risks. Due diligence of a supply chain is a complex concept, but it is very important, because of the reputational damage of the company but also because of the raw material security. With the RSN structure due diligence is becoming measurable and comparable between companies.

Companies declare that transparency is one of the best solutions to the conflict minerals problem, but they also indicate that the supply chain for one mineral can be up to 10 tiers of suppliers and consumers. Considering that products consist of 150 minerals means that there are 1500 suppliers involved for one product. This illustrates that it is difficult to observe all these steps and thus create the required transparency. Furthermore, creating transparency can be inhibited by information in the supply chain being confidential, making it impossible to openly declare. Only the smelters and refiners have to be declared in current regulation.

In conclusion, the level of awareness is acceptable and the transparency level is too low. Increasing transparency can be achieved by sharing of information about the supply chain and the due diligence, introducing certificates, and by a widespread application of the RSN grid.

7.3 Sub question 3 – Stakeholders and guidance

This section answers sub question 3 which states: **Which stakeholders and guidance can support organisations to comply with the European conflict minerals regulation 2017/821?**

Cooperation and shared initiatives are key to compliance with EU CMR according to the interview data with companies and stakeholders. In existing regulation these have proven to be particularly successful factors and are also stimulated in EU CMR. Currently, there are a variety of different initiatives. The EU CMR may play a role in structuring and combining these initiatives in order to increase their effectiveness.

There are many initiatives to support downstream companies to comply with the EU CMR. For a company it is important to know who can advise them in terms of achieving due diligence. Downstream companies would be helped with clear responsibilities and an overview of all the initiatives. Cooperation between sectors and stakeholders is important to comply with new regulation Multi stakeholder initiatives can generate value for companies for compliance with the EU CMR.

SSCM is an important way of using literature and research into a supply chain management strategy. This thesis states enablers and barriers to the proper implementation of SSCM. In summary, cooperation, good management and government regulation are enablers., while the barriers are lack of expertise and training, cost complexity, lack of supplier involvement and shortcoming of responsibility from top management.

Consultant organisations are willing to help companies to comply with the regulation this only requires a financial investment to be able to comply. Additionally, companies themselves have to put in the effort to understand their own supply chain and to be able to report on it.

7.4 Main research question

The aim of this thesis is to understand the awareness about and the challenges of EU regulation on conflict minerals and to find an approach to address them.

The aim of this thesis is achieved by answering the main question: ***How can companies and governance implement the European conflict minerals regulation 2017/821?***

Five points are important from the results:

1. Imbalance between RS and EU CMR
2. Lack of awareness about the EU CMR
3. Lack of transparency in the supply chain
4. Desire for cooperation between stakeholders
5. Unclear responsibility for organisations

The first quite important finding serves as a background for the main research question and concerns the imbalance between the theory of responsible sourcing and the implementation of the law. While theory articulates responsible sourcing as: social, economic and environmental, both EU CMR and OECD focuses only on the social and economic aspects of responsible sourcing.

Awareness about the EU CMR is required by all stakeholders, to be able to ask questions in parliament, research the issues and support the development of the regulation. From the research done during this thesis it became clear that the current levels of awareness about the EU CMR is sufficient to effectively combat conflict minerals.

Transparency in the supply chains gives insight in who is part of the supply chain. For supply chain due diligence transparency is important. Tools to create more transparency and traceability are blockchain, chain of custody and trace elements. It is important to keep the goal of the tracing in mind.

Connection between all different stakeholders is not strongly present, even though all stakeholders state that the situation about conflict minerals would improve with more cooperation between stakeholders. Many initiatives to support companies exist, but it seems that the companies cannot find these initiatives.

The main challenge of the EU CMR is that most companies claim no responsibility, because the regulation applies only to importers. However, voluntarily taking up responsibility is encouraged by the regulation. The OECD incentives all companies in the mineral supply chain that supply or use minerals sourced from conflict - affected or high-risk areas, to invest in conflict free minerals and remove conflict minerals from their supply chain. The challenge of responsibility may be addressed by increasing the scope of EU CMR to match the broad scope OECD.

So, five points above the following deeper observations can be made. There is a gap between EU CMR and CE and SDGs. Alignment is missing between the social and the environmental aspects in research and in regulation. The EU CMR focuses on the social impact of conflict minerals but does not focus on the environment because it is not urgent enough. While the CE is about new technology and new business models, SDG's focus on both the people and the planet. Currently, policymakers have little knowledge on the subject. It is essential to bring together these differing points of view in order to be able to combine them so that they can strengthen each other. Figure 12 demonstrates that all sectors from the quadruple helix have to work together to fulfil the SDGs; it is possible to adequately address the problems concerning conflict minerals with regulation, research, industry cooperation and civil society.

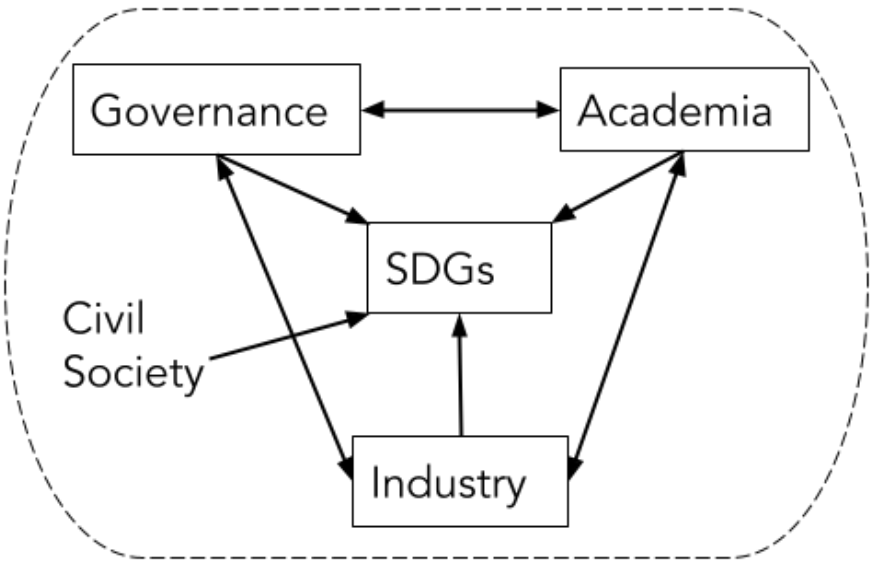

Figure 12: Quadruple helix with SDGs

7.5 Recommendations for further work - per sector

The recommendations for further work are divided per sector because of the separation and interconnectedness of the four sectors, academic, governance, industry and civil society. Because the sectors are being handled separately, different recommendations have been determined for each sector shown in figure 13.

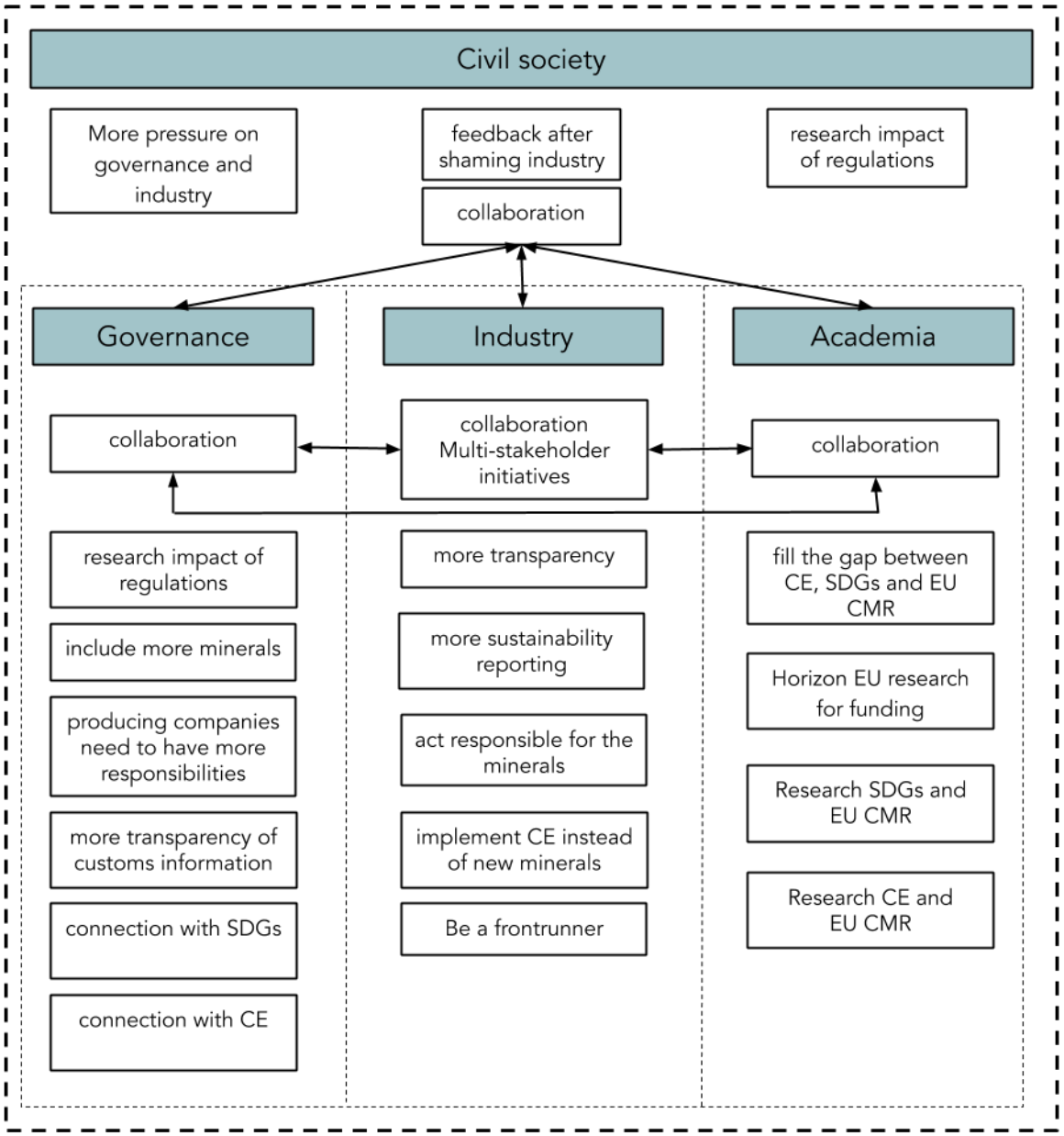

Figure 13: Recommendations per sector

7.5.1 Academic recommendations

The collaboration between stakeholders and research to help other sectors is recommended. In this chapter future research in line of the thesis is discussed. The Horizon EU research action could help funding for research in the field of EU CMR and CE and SDGs

Research that intends to directly follow up on this thesis should cover the following topics: As was mentioned in the conclusion chapter 7.2 the awareness of EU CMR was not wide spread through the organisations. The implications of this lack was not part of this thesis but should be researched more. As is stated in the conclusion chapter 7.2 most companies declare that transparency in the supply chain is one of the best solutions to the conflict minerals problem. For in future research this intention towards transparency should be tested in a highly critical manner.

The EU limitation of the regulation both included minerals and focus on importers should not limit the scope of future research into RS. Smart technology is commonly presented as a viable solution for increasing sustainability and therefore reaching goals set in the Paris Agreement and SDG's by the UN. However, this presents a trade-off between the sourcing of conflict minerals and the beneficial effects of these technologies, which can in itself cause problems that these goals are attempting to abate. In future technological developments the aforementioned trade-off should be strongly considered. This thesis found that mandatory sustainability reporting for consumption and production companies will bring the corporate reporting structure in the CMR in line with SDG 12. Academia should research how this can be implemented.

During future research the connection between CE and EU CMR can be further investigated. If minerals are recycled they fall outside the scope of the EU CMR and do not have to be mined again this makes a large positive impact on the human rights in the mine and the environment. However, there is an increasing need for new minerals, especially in the energy transition, which will not be covered by recycling alone. The true cost of minerals is an interesting research field. By increasing the focus of EU CMR on the environmental aspects of mining, the value of the minerals may be increased and would therefore be more likely to be recycled, since the costs of mining would be more aligned with those of recycling. To create a world where no harm is done to the human or environment is a long way to go.

7.5.2 Governance recommendations

EU regulation are limited to only four minerals and apply only to importers of raw materials and not to semi-manufactured products. For effectively abating the problems concerning conflict minerals more minerals need to be included in this regulation. The regulation should further be applicable for semi-manufactured products as well. Currently, especially the semi-manufactured products are difficult to monitor and control by the government, however, this does not mean that they should not be included in the regulation.

Collaboration between all sectors is already present, but it is important to keep in contact and work together to come to better solutions. Visibility is important here, as is the possibility of joining cooperative links.

Given the stage of implementation of EU CMR it may be too early to assess the impact of EU CMR, however, it is essential to monitor the effectiveness of EU CMR on increasing awareness and transparency. Additionally it is important to measure the impact of the regulation in conflict area's this is the responsibility of the governance because they introduce legislation, and it is essential to know how people are helped with the regulation and how it possibly could improve more.

For the review clause it is recommended to include more minerals in regulation for example materials essential for the energy transition as cobalt but especially critical materials because of the high economic value and their scarcity.

For the EU CMR awareness about the responsibilities is essential now only the importers are obligated but the whole supply chain is responsible. It is important to make the companies who buy the minerals no matter in what form, responsible and contactable about their dealings. This thesis aims to emphasise that EU CMR does not specify the terms they use and that the meaning of the terms is not explained in sufficient detail. This is important in terms of clear communication and understanding of the EU CMR.

For more information transparency about importers who fall within the scope of the EU CMR is required. Now customs has this information and will not give it to other organisations than the enforcers of the legislation which makes it a black box and impossible to question or research.

7.5.3 Industry recommendations

Collaboration with all four sectors is important and this can be achieved via multi-stakeholder initiatives but also other initiatives and sectors are good to keep close by.

More transparency about the supply chain, smelters and refiners is recommended. With more transparency it will become more viable for the consumer to understand what they buy, and they will have a choice in that. For enforcers of the regulation this is also preferable this will make their job easier and more clear.

Companies have to feel responsible for what they are doing. They need to act more responsibly with respect to the minerals. Supply chains are long, and it is difficult to see where materials come from but with good management the responsibility can be taken.

Companies need to be more sustainable with sustainability measures next to the social measures performed on SSCM and RS this can be achieved.

If companies invest in a circular economy approach, where materials are recycled but also made to be able to easily disassembled. In this way companies fall outside the scale of the regulation and are less dependent on newly mined minerals.

If companies have intrinsic motivation to want to be sustainable and socially responsible, then much is possible. It has to come from the inside of the companies not only from legislation and shaming.

7.5.4 Civil society recommendations

Collaboration with the other sectors but also with other countries is required to make sure the EU CMR is not bypassed in other countries where there is a less strong civil society.

Feedback for companies after ratings is recommended. Civil society can support industry to do better. They do not have to give away their way of testing, but they could say something on how companies could improve and how they should do that. Research on how well industry is performing and shaming companies with a bad name to push towards more responsible and transparent business.

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Appendix A: Sustainable Development Goal 8, 12 and 16

only important goals, targets and indicators

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

"8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms
8.7.1 Proportion and number of children aged 5–17 years engaged in child labour, by sex and age" (UN, 2020)

"8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment
8.8.1 Fatal and non-fatal occupational injuries per 100,000 workers, by sex and migrant status
8.8.2 Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status" (UN, 2020)

"8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries
8.a.1 Aid for Trade commitments and disbursements
8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization
8.b.1 Existence of a developed and operationalized national strategy for youth employment, as a distinct strategy or as part of a national employment strategy" (UN, 2020)

Goal 12. Ensure sustainable consumption and production patterns

"12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries
12.1.1 Number of countries developing, adopting or implementing policy instruments aimed at supporting the shift to sustainable consumption and production" (UN, 2020)

"12.2 By 2030, achieve the sustainable management and efficient use of natural resources
12.2.1 Material footprint, material footprint per capita, and material footprint per GDP
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP" (UN, 2020)

"12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly

reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement
12.4.2 (a) Hazardous waste generated per capita; and (b) proportion of hazardous waste treated, by type of treatment"(UN,2020)

"12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.6.1 Number of companies publishing sustainability reports" (UN, 2020)

"12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment" (UN,2020)

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

"16.1 Significantly reduce all forms of violence and related death rates everywhere
16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age
16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause
16.1.3 Proportion of population subjected to (a) physical violence, (b) psychological violence and (c) sexual violence in the previous 12 months
16.1.4 Proportion of population that feel safe walking alone around the area they live"(UN,2020)

"16.6 Develop effective, accountable and transparent institutions at all levels
16.6.1 Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)
16.6.2 Proportion of population satisfied with their last experience of public services"(UN,2020)

Appendix B: Literature framework

Article	Concept					
	Conflict minerals	Governance (law and regulations)	Human rights	Responsible sourcing	(sustainable) mining	supply chain
Airike, Roer & Mark-Herbert, 2016	✓			✓		✓
Asr et al., 2019			✓	✓	✓	
Buss, 2018		✓	✓		✓	
Diemel & Hilhorst, 2019	✓	✓	✓	✓	✓	✓
Hofmann, Schleper & Blome, 2018	✓					✓
Iacovidou et al., 2017		✓				✓
Sarfaty, 2015	✓		✓	✓		✓
Silva & Schaltegger, 2019	✓		✓	✓		✓
Swift, Guide, & Muthulingam, 2019	✓					✓
Van den Brink, Kleijn, Tukker, & Huisman, 2019				✓		✓
Voland & Daly, 2018	✓		✓	✓		✓
Young, 2018	✓	✓		✓	✓	✓
Young, Fernandes, & Wood, 2019	✓		✓	✓		✓

Appendix C: Long list company selection

Companies	Sector	Location of the headquarters	data due diligence
AkzoNobel	paints and coatings	Amsterdam, NL	Report
Alcom	Electrical & Electronic Manufacturing	Capelle aan den Ijssel, NL	Statement
Amphenol	Electronics	Wallingford, (HQ) Houten, NL (EU HQ)	SEC filing
Avnet	Electronic components	Phoenix (HQ) Breda (NL office)	SEC filing
Asml	semiconductor	Veldhoven, NL	Report
Bgrid	Information Technology	Amsterdam, NL	Non
Eurocircuits	semiconductor	Mechelen, BE	Statement
Fairphone	phones	Amsterdam, NL	Reports
Farnell	distributor of electronics	Leeds, UK	Statement
Fokker service	Aerospace	Hoofddorp, NL	Statement
Heineken	Beer	Amsterdam, NL	Heineken-Congo agreement
ING	Banking	Amsterdam, NL	Non
Philips	Electronics	Amsterdam, NL	SEC filing and report
RS Components	Electronic components	Corby, UK Haarlem, (NL office)	Compliance brochure
Automotive company	Electric cars	Amsterdam (EU HQ)	SEC
TomTom	software	Amsterdam, NL	Statement
Wurt Elektronic	Electronic & Electromechanical Components	Niedernhall, DE	Report

Appendix D: Consent form conflict minerals research

The purpose of the research on how electronic manufacturing companies in Amsterdam are dealing with the conflict mineral regulation. To start companies are selected desk research about the online published information about conflict minerals and the combat to avoid those materials is gathered. To validate the collected data interviews are crucial.

Participating could help to overcome the bottlenecks and learn from other insights of conflict minerals.

The interview transcript will be sent to the participant to check the accuracy after approval the participant can be cited with full name. The participant has the right to rectification or erasure of personal data.

The interview will be recorded if the participant allows.

This report will be published on the WUR and TU Delft repository for thesis reports.

Contact details researcher: Gwenhwyfar Spil, g.spil@student.tudelft.nl

Consent Form for Gwenhwyfar Spil

Please tick the appropriate boxes taking part in the study	**Yes**	**No**
I have read and understood the study information dated 27/05/2020. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand that taking part in the study involves an audio recording what will be transcribed as text and attached to the thesis document	☐	☐
I understand that information I provide will be used for a thesis report	☐	☐
I agree that my real name can be used for quotes	☐	☐

_____	_____	_____
Name of participant	Signature	Date

I have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Gwehwyfar Spil	_____	27/05/20
Researcher name	Signature	Date

Study contact details for further information: supervisor Jaco Quist at j.n.quist@tudelft.nl

Appendix E: Interview questions

Introduction questions
What is your role in the organisation?
What do you know about conflict minerals?
What do you know about responsible sourcing?
How do these topics relate to your work?

Governance
What knowledge do you have of the EU regulation concerning conflict minerals?
Where did you acquire this knowledge?
Are there positive and negative aspects of these new regulation to come to the end goal of responsible sourcing?
What must be achieved around due diligence and what changes are required for this?
What actions/activities are needed for that and who should do it? (companies, government, research, social organisations) and how can these work together for this?
Can you reflect on how your company/ most companies are going to anticipate this regulation?
Do you foresee more regulation coming up or developing around the conflict minerals regulation?

Civil society /NGO's
What is your opinion on NGOs performing international ratings of due diligence done by companies? (RSN, Enough projects, Amnesty International)
I used all publicly available data to rank your company/ most companies via the Responsible Sourcing Network ranking system. Your score is … out of 100 do you agree with this score?
Can you reflect on the given score?
Is there pressure on companies, coming from your consumers, concerning conflict-free products and responsible sourcing? Could you elaborate?

Industry
How does your company/ most companies monitor the usage of conflict minerals in products?
How does your company/ most companies encourage suppliers to source from DRC conflict free and not to avoid it?
How does your company/ most companies acquire transparency and traceability in the supply chains?
Is there a difference in the four minerals in both transparency and communication with the suppliers and the mines thereof?
In what way does the size of your company/ most companies support and counter react to comply with the EU regulation, due diligence OECD 5 steps?
What is at this moment key developments regarding conflict materials?
What are the largest obstacles for your organisation/ most companies to source responsible?
Can you give some lessons learned for other organisations who need to deal with the regulation?

Academic
What is the added value of research in the field of conflict minerals for your company/ most companies?
What is for you the most important step towards responsible sourcing?
What kind of research can researchers do to get conflict minerals and responsible sourcing further on the map?
What is at this moment key developments regarding conflict materials?
How could responsible sourcing and knowing where the materials come from fit in the transition to a circular economy?