Cost & Capital

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Conflict Mineral Value Chain

Key Takeaways

- **SEC reporting -** Dodd-Frank Section 1502 states that all public companies must identify and report the existence of any conflict minerals in the manufacture of the products they produce or contract to manufacture.
- **Conflict minerals are used in many common components –** Tungsten, Tantalum, Tin and Gold are the currently identified elements that are required to be identified and traced in the value chain. These elements are found in many products including printed circuit boards, heating elements, solder, lighting, lubricants, steel plating and some chemicals.
- **Required Audits –** To comply with Dodd-Frank, companies must audit their supply chain to identify components that use the four elements and then identify if they come from the conflict region of the Congo.

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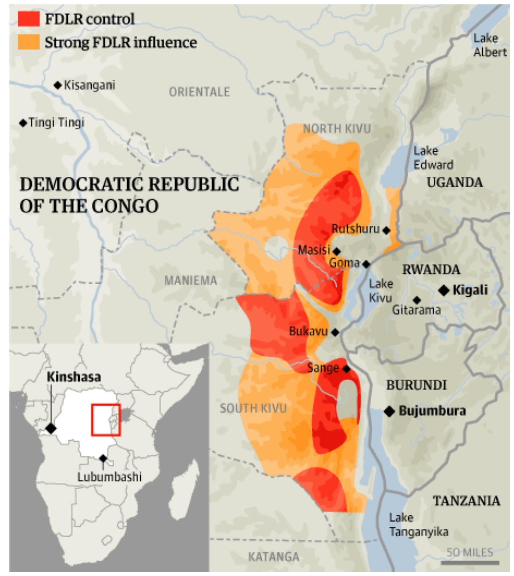
Introduction

Meant to address the deadliest conflict since World War II, Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act states that companies will need to disclose whether they utilize conflict minerals in the products they manufacture or contract to manufacture. Conflict minerals are defined as wolframite (tungsten), comumbite-tantalite ("coltan" or tantalum), cassiterite (tin), and gold. The US Secretary of State has been given the ability to add minerals to this list if it is determined they financially support armed groups. Companies will be required to identify products that require conflict minerals for their production or functionality. If a company's products utilize conflict minerals, or their derivatives, they will need to state whether those minerals originated from the Democratic Republic of Congo or adjoining countries including Angola, Burundi, the Central African Republic, the Republic of Congo, Rwanda, South Sudan, Tanzania, Uganda and Zambia (collectively labeled as "DRC Countries"). The majority of conflict mines are located along the DRC's eastern border indicated in Figure 1. It is worth noting that as of late 2011, the SEC does not plan to require companies to report whether or not production equipment and tooling required to produce products contain conflict minerals. Also, retailers that do not have contracts or other involvement regarding the manufacture of products specifically for them will be excluded.

Figure 1: **Conflict Mineral Map**



Source: The Guardian.

Although reporting procedures are still being defined, companies that report under the Exchange Act will likely need to state their use or lack of use of conflict minerals in their 2012 Annual Report and online. It is important to note that the use of conflict minerals is not prohibited; however pressure from consumers, industry groups, and NGOs will likely lead to reduce usage of such minerals originating from DRC Countries.

As detailed in Figure 2, the applicable conflict minerals exist in a wide variety of products impacting many industries. Companies will be required to audit their supply chain and keep records demonstrating that conflict minerals did not originate in the DRC Countries. This will likely be achieved via a combination of internal reviews, industry groups (e.g. the EICC (Electronic Industry Citizenship Coalition), is beginning an approved smelter list), and private audits. With the correct approach and focus, companies can leverage the required investigations to help identify weaknesses and opportunities throughout their value chain. Required activities such as value engineering value analysis, value chain review and supplier audits may provide visibility into suppliers' ways of working, thus revealing savings opportunities.

Figure 2: **Conflict Minerals, Sources and Usage**

Mineral		DRC Production %	Usage	
Tungsten (Wolframite)	**W**	DRC (3%)	• Heating Elements • Lighting • Lubricants	• Jewelry • Plastic Composites • High Speed Steel
Tantalum (Columbite-tantalite, Coltan)	**Ta**	DRC (17%)	• Capacitors • Mobile Phones • Tablets • Carbide Tools	• PCs • Auto Electronics • Jet Engines • Nuclear Reactors
Tin (Cassiterite)	**Sn**	DRC (5%)	• Steel Plating • Solder • Casting Alloys	• Glass making • Chemical Applications
Gold	**Au**	DRC (2%)	• Connectors • Jet Windshields • Medicine	• Integrated Circuits • Jewelry • Photography

Source: Cost and Capital Analysis

Approach

Existing Approaches

Prior to the enactment of Dodd-Frank, a myriad of industry groups, government groups, and NGOs such as EICC, the Enough Project, OECD (Organization for Economic Cooperation and Development), RESOLVE, Global Witness, Falling Whistles, and Human Rights Watch have focused on ways to limit armed groups from profiting as a result of illicit mining of conflict minerals. Traditionally, the focus has been on major consumer-facing electronic OEMs. However, with the enactment of Dodd-Frank, all companies that manufacture or contract to manufacture products that require conflict minerals for their production or functionality will be required to report where these minerals originate.

As a start, non-electronic companies can largely adopt policies and processes that have been formulated by the electronic industry. Companies such as Nokia have long required their suppliers to confirm that no conflict minerals are utilized throughout the supply chain. This is achieved by contracts, supply chain mapping, due diligence, and risk analysis. Below is an excerpt from Nokia's raw materials policy:

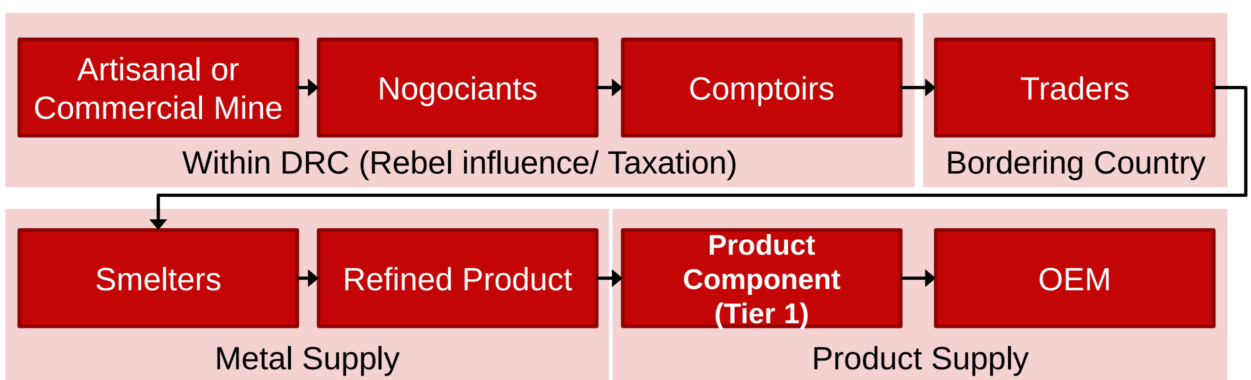
"Even though Nokia does not source or buy metals directly, we are very concerned about the potential link between mining and the conflict in the Democratic Republic of Congo. We are appalled by the reports from the conflict areas and strictly condemn all activities that fuel conflict or benefit militant groups. We require high ethical standards in our own operations and our supply chain and take continuous action to ensure that metals from the conflict areas do not enter our supply chain.

Nokia became aware of the potential link between mining of Coltan and financing of the conflict in the Democratic Republic of Congo (DRC) in 2001 and took action immediately to ban Tantalum derived from illegally mined Coltan. Since then, together with the electronics industry we have been actively participating in the work to ensure full traceability of metals back to their original sources."

Value Chain

Many companies are not directly involved in the sourcing of their raw materials, including conflict minerals. In fact, as illustrated in Figure 3, many OEMs are oftentimes seven or more steps removed from the actual mines.

Figure 3: **Conflict Mineral Value Chain**



Source: RESOLVE

The large disconnect between OEMs, consumers, and the actual conflict area mines requires cooperation throughout the value chain to ensure accurate reporting. The first step to any reporting is a technical audit to determine whether or not tungsten, tantalum, tin, or gold exist in or are required to produce a product. If this audit determines that conflict minerals are needed, then the company must determine if such minerals originated from DRC countries. To do this the SEC currently requires a loosely defined "reasonable country of origin enquiry". The exact method of reporting is still under development and will likely evolve over time, but OEMs and component suppliers will likely be able to pool their resources and work with such groups as the EICC to identify smelters and refiners that do not source any minerals or metals directly from DRC countries. Some consumer facing OEMs, such as Apple, have already started such audits.

Case Study: Apple

Situation:

Apple has made a public commitment to extend its social responsibility efforts to the raw materials that it uses in the manufacture of its products. This commitment has been made as the company works to ensure compliance with the conflict minerals provisions of Dodd-Frank.

In particular, the company requires suppliers to only use 'conflict-free' metals from sources that meet Apple's human rights and environmental standards. The company notes, however, that the lengthy nature of its supply chain – as well as the nature of the refining process – makes it "difficult to track and trace these materials". Apple illustrates this challenge by noting that its supply chain runs through "family-run mines, brokers, smelters, refiners, and commodity exchanges – before reaching a component or subcomponent manufacturer."

Approach:

Apple took two key approaches to this challenge. The first was to map its supply chain down to smelter level in order to:

- Identify which suppliers are using tantalum, tin, tungsten or gold
- Identify from where such suppliers are sourcing these metals

The second is to work with the EICC and the Global e-Sustainability Initiative (GeSI) to:

- Audit relevant smelters
- Validate identified mineral sources as 'conflict-free'

In addition, Apple is, along with others in the electronics industry, engaging with the SEC and the US State Department as they develop the regulations that will ultimately implement the terms of Dodd-Frank.

Results:

In 2010, Apple completed a detailed study on the use of tantalum, tin, tungsten or gold throughout its supply chain, including both component/subcomponent suppliers and metal smelters. The results of this study – which marks a crucial first step for any company attempting to identify potential conflict minerals from its supply chain – are set out in Figure 4 below:

Figure 4: **Apple Conflict Minerals Mapping**

Mineral	Tantalum	Tin	Tungsten	Gold
Suppliers using metal in components of Apple products	23	125	23	116
Smelters used by these Apple suppliers	12	43	13	41

Case Study Source: United Nations Global Compact

As the case study indicates, supply chains of OEMs are extensive and complex. Apple's suppliers currently use at least 109 smelters. The SEC expects that "most affected issuers will contribute to and rely on an industry wide due diligence process as part of their overall compliance" to help reduce costs and time to implement. Companies will likely have to work together and with industry groups to determine chain of custody for smelters' material. Without such reviews, the SEC will likely not allow companies to declare that their products are conflict free.

As is evident, the exact approach will depend on a company's particular maturity related to conflict minerals. However, in general the steps outlined in Figure 5 should be followed to work towards Dodd-Frank compliance. The first two steps must be done internally within the company with some assistance from suppliers. The Violation Process and Audit Supply Chain steps can be performed together with industry groups. Lastly Reporting Results will be conducted by the company along with an independent auditor.

Figure 5: **Conflict Mineral Approach**

Establish Policy

- Develop supply chain policy related to conflict minerals
- Communicate policy to current and new suppliers process
- Establish chain of custody and traceability process
- Include policy language in future contracts

Technical Audit

- Perform value chain risk assessment
- Evaluate materials and designs requiring conflict minerals for their production or functionality

Violation Process

- Develop a process to remediate any components with identified conflict minerals (as required by company policy)
- Define metrics to measure and track improvement related to usage of conflict minerals
- Establish internal and external communication approach and risk strategy

Audit Supply Chain

- Coordinate with sub-suppliers and industry groups to identify key choke points such as smelters
- Perform on-site third party audits to assess chain of custody and rate risk of conflict minerals (i.e. audit smelters' representations and suppliers' declarations)

Report Results

- Compile conflict minerals report
- Organize and independent audit of the conflict minerals report
- Report results of conflict minerals report and audit to the SEC (e.g. 10-K, 20-F and 40-F filings)
- Disclose the report on company website
- Review previous findings for following year

Source: Cost and Capital Analysis, MJB Consulting

Costs and Risks

Estimated Costs

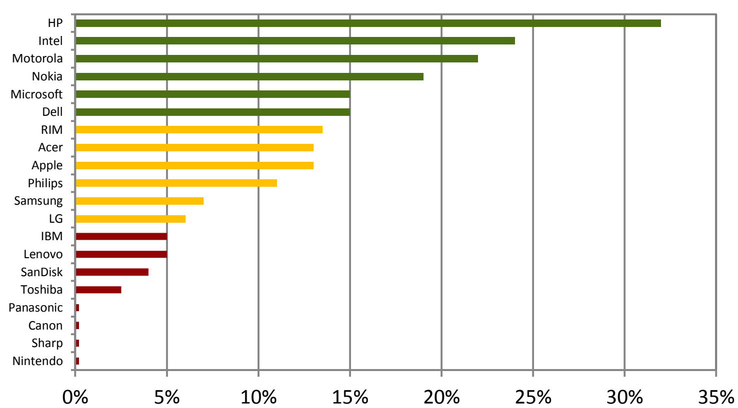
The SEC expects costs to implement the Dodd-Frank conflict mineral rules to be rather minimal. This is largely due to the anticipated cross-industry cooperation to identify clean upstream sources of conflict minerals. The SEC expects the 6,000 impacted companies to spend a total of 153,864 hours (an average of 25.6 hours per company) collecting information, preparing & reviewing disclosures, filing documents, and retaining records. Unless OEMs receive the majority of their information from suppliers, this time estimate is likely very low. A high level of internal coordination between groups such as Internal Audit, Purchasing, Finance, Legal, Communications, Engineering, and Research & Development will likely be required to even establish a policy and identify where conflict minerals are utilized in the supply chain. From a man-hour perspective, the SEC's anticipated time of 25.6 hours could be quickly surpassed from several internal meetings alone. It is worth noting that a Tulane University and National Association of Manufacturers study determined that the cost of implementation could be up to 100 times more expensive than the SEC's current estimation. For this reason, it is critical that companies prepare a detailed implementation plan and review industry best practices as soon as possible to avoid internal duplication and misalignment.

An additional component of the law is that each company that files a Conflict Minerals Report will need to have the report audited by an independent third party. For the 6,000 impacted companies, the SEC expects an external audit cost of $71,243,000. Fortunately, companies whose products do not require conflict minerals for their production or functionality will not require these audits. As of October 2011, the SEC anticipates that 20% or 1,199 companies will require a third party audit of their Conflict Minerals Report. This implies an external audit cost of $59,429 per company.

Risks of Noncompliance

As previously mentioned, as of late 2011, there are no defined penalties for utilizing conflict minerals from the DRC. However, numerous NGOs are tracking the nascent compliance of major electronic OEMs. As the Dodd-Frank rules become active, NGOs will likely expand their focus and even independently audit companies' claims that they are not only Dodd-Frank compliant but conflict mineral free. Although NGOs will not be able to do this until 2013 at the earliest, companies that are well prepared will be able to avoid the harshest judgment from NGOs and ultimately their customers. As seen in Figure 6, the Enough Project has released a ranking of electronics companies' conflict mineral compliance. This ranking is likely to grow and possibly become harsher as reporting requirements are refined over the coming years.

Figure 6: **Conflict Mineral Compliance Ranking**



Ranking Criteria

- **Policy –** Stated policies and outlined criteria score higher in the NGO rankings
- **Mineral Tracing –** Identified at-risk content, chain of custody process and reporting
- **Audits –** Percentage of supply base that is at-risk and regularly audited
- **Supplier Engagement –** Contract language to outline supplier requirements with procedures and penalties
- **Support –** Public support of conflict-free goals and legislation

Source: The Enough Project.

Risks of Compliance

Several risks of compliance with Dodd-Frank should be internally reviewed by impacted companies. These risks include but are not limited to:

- Allowing competitors visibility into the supply chain
- Allowing suppliers and customers too much visibility into supply chain
- Duplication of effort across value chain
- Commodity cost increases

The majority of these risks can be addressed by partnering with industry groups and ensuring proper non-disclosure agreements are developed and distributed. Each company will independently need to weigh the benefits of transparency with the risks of revealing proprietary supply chain information that provides a competitive advantage.

Benefits

The SEC states the benefit and goal of Section 1502 as "furthering Congress's goal of deterring the financing of armed groups in the DRC countries through commercial activity in conflict minerals". The theory is that companies will limit their purchases of conflict minerals from the DRC countries, thus limiting a critical supply of funding for armed groups in the region. While the social benefits may be difficult to measure or even achieve, supply chain organizations can leverage the Dodd-Frank requirements to gain a competitive advantage.

Value Chain & Cost Driver Visibility

If properly planned and executed companies can leverage their conflict mineral research to achieve savings throughout the value chain. Detailed audits of material content will allow companies to identify key minerals, metals and thus cost drivers that suppliers are using in their components. Although Dodd-Frank does not require companies to state the percentage of specific materials in a product, companies could use the Act as a reason to receive a detailed BOM and cost breakdown from their suppliers. In addition to allowing companies to track success of limiting conflict minerals in products, such breakdowns could be reviewed by Engineering and Research & Development to compare usage to original specifications as well as potential alternate materials.

Recycled Content

Suppliers often claim that they utilize virgin metals in their products, however OEMs historically have limited visibility to validate such claims. This disconnect in limited supply chain visibility was highlighted by a 2011 RESOLVE Survey. When OEMs were asked if they receive recycled metals, respondents indicated that 9% of their suppliers provided recycled materials, 32% of suppliers did not provide recycled materials, in the remaining 23% and 36% of situations the OEMs were respectively either unaware whether recycled materials were used or unwilling to divulge the information. Meanwhile when suppliers were asked if they provided recycled materials to their customers (i.e. OEMs), 50% said "yes" which clearly does not align to the OEM perspective. Suppliers can use this limited vsibility as an excuse to tie component pricing to rapidly rising world market pricing for virgin materials (i.e. request a price increase as soon as market pricing increases). Since the SEC is proposing that recycled or scrap metals will be declared "DRC conflict free", companies will need to specifically ask their suppliers whether virgin minerals or metals are involved in the production of their products. As this information is ultimately reported to the SEC via a Conflict Minerals Report, suppliers will need to provide accurate responses. If collected and maintained properly this information will potentially provide purchasing teams with yet another leverage point against price increases.

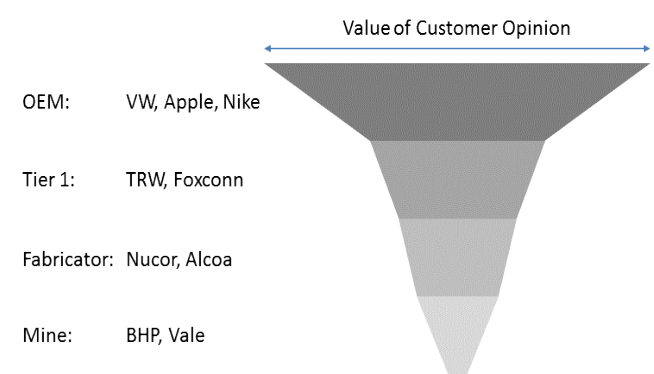
Volume Consolidation

The SEC is likely to allow "flow down" provisions where companies can direct component suppliers to utilize specific smelters that have been deemed "DRC conflict free". As seen in the Apple case study, companies can have over a hundred smelters ultimately providing metals to their components. Visibility into the supply chain will help to reduce risk, consolidate volumes and simplify the supply chain. Having the Dodd-Frank bill as a reason for such a discussion on the aforementioned topics should help to limit supplier resistance.

Branding

Although the new regulations apply to all companies whose products contain or require conflict minerals, they are especially important to consumer-facing entities. Since the law does not prohibit the use of conflict minerals, it largely relies upon consumer pressure. NGOs have historically placed their focus on large, well known consumer-facing companies. This is exemplified by the Enough Project's scorecard which ranks companies such as HP, Intel, LG and IBM while largely ignoring their suppliers. Historically, lack of compliance at consumer-facing companies is more likely to create headlines and social buzz than a scandal at a mining company such as Vale.

Figure 7: **Consumer Value Funnel**



Source: Cost and Capital Analysis.

Companies that take a proactive approach towards auditing and monitoring their supply chains could partner with NGOs to spread information to consumers. Advertising campaigns could eventually be introduced to highlight conflict free products thus creating a competitive advantage.

Conclusion

While still controversial and under revision, Section 1502 has the potential to prove transformational not only for Africa, but for global Supply Chain organizations. Working with industry groups to develop policies and approaches can help save companies valuable time. Companies should utilize their limited resources to extract value from Dodd-Frank related initiatives. Merely gathering information to develop or refresh a Conflict Minerals Report will appease NGOs at best and will likely ultimately lead to a competitive disadvantage. A proactive and cross functional effort led by the Purchasing organization can be leveraged to gain supply chain visibility, identify cost breakdown information, product content details, value engineering, and volume consolidation opportunities.