Conflict-free minerals supply-chain to electronics

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Abstract

The Conflict Free Smelter (CFS) Program is a novel mechanism of corporate social responsibility (CSR) and sustainability management, which provides assurances on the sources of strategic resources used in electronics. The program achieves this by auditing metal smelters and refiners to confirm that that they have not sourced materials from conflict regions. The structure of the program includes formal protocols, an audit review committee, stakeholder consultation, and an industry oversight group. Although it has faced technical challenges in implementing protocols, the CFS has demonstrated the ability to identify sources of metals. Data show that the quantities of metals from compliant facilities currently represent a fraction of market volume, with the exception of a significant number of compliant tantalum refiners. Through this initiative, the electronics sector has influenced social performance in firms that are many tiers deep in the supply-chain. Possible expansion to other sustainability issues and sectors is possible.

1 Background

The Conflict Free Smelter (CFS) Program provides assurances on the sources of strategic resources, which contain metals that are ultimately used in electronic products. The CFS was established as a response to concerns in the Democratic Republic of Congo (DRC) associated with "conflict minerals," defined as tantalum (Ta), tin (Sn), tungsten (W) and gold (Au), and their compounds. Revenues from the extraction of these minerals in the eastern DRC have been associated with financing warfare and consequently exasperating severe human rights violations in the region [1–3]. After years of failed state efforts (including a United Nations peacekeeping force) NGO's began to appeal directly to consumers, including high-profile campaigns advocating electronics original equipment manufacturer (OEM) corporations to apply policies and their purchasing power to address conditions in Africa [2], [4].

The CFS program functions in parallel to efforts by government, non-governmental groups and other industries, including the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals [5], and section 1502 of the United States 2010 *Dodd-Frank Wall Street Reform and Consumer Protection Act* [6], which uses a novel legal approach to force information and transparency regarding company use of conflict minerals [7]. Other industry efforts include a tin industry operation that provides "bagging-and-tagging" of mineral ores in Rwanda [8], and efforts by the leading bullion gold association on responsible sourcing of gold [9].

The annual global mine production of the four metals defined as conflict minerals is valued at about $170 billion (Figure 1); however, this value does not include recycled production therefore the total market volumes of the four metals entering smelters and refineries, which accept both mine and recycled production are likely significantly greater than those shown in Figure 1. In the case of gold, based on US statistics [10] the aggregate value may be more than double primary production alone. Nonetheless, it is clear that of the conflict minerals, gold is the dominant metal by value.

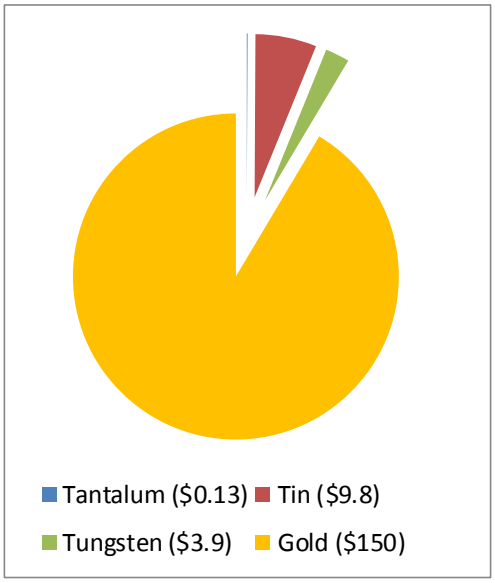

Figure 1: Primary production of "conflict mineral" metals, 2011 (billions US$, estimated based on [10])

1.1 Program Structure

The CFS is managed by a working group of companies, mostly members of the Electronic Industry Citizenship Coalition (EICC) or the Global e-Sustainability Initiative (GeSI). Since its start in early 2011, the program has utilized detailed auditable protocols that define documentation and traceability requirements of mineral shipments received at smelters/refiners. The EICC and GeSI member companies help identify priority suppliers and thus target smelters and refineries they wish to be compliant. To be compliant, processors must not accept materials from known or plausible conflict regions.

Auditors visit smelters and refiners to assess the traceability of metals back to sources at mines to assure compliance. Major metal producers around the world have been evaluated, including in Australia, Canada, China, Germany, Japan, Kazakhstan, Russia, Thailand, and the USA. An audit review committee oversees the work of auditors and approves compliance of facilities.

Facilities voluntarily participate; however, there is both pressure and encouragement from their customers in the value chain, including OEM electronics companies. Names and dates for compliant facilities are published on the CFS website [11].

The supply chain of metals to electronics products varies from as few as 5 tiers to as many as 9 tiers of suppliers (Figure 2) [12]. There is a narrowing in the number of actors in the chain of production at the point where metals are processed into high purity grades. For Ta, Sn and W this point occurs at metal smelters, which accept both mineral ores from mines and concentrates from industrial sources for chemical or thermal conversion into pure metals and alloys. For gold the point of convergence in the supply chain is with refiners, which process gold from primary raw metal and recycled sources into pure metal (e.g., 99.99%) suitable for bullion and jewellery, as well as industrial grade metal. The CFS therefore targets smelters and refiners as "gates" where the supply of metal shipments can be controlled and audited.

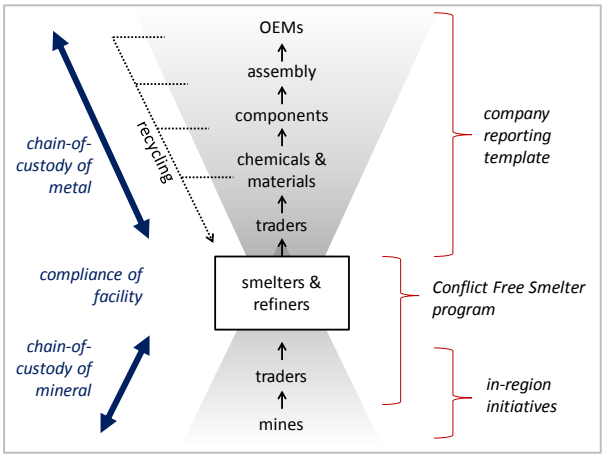

Figure 2: Place of the CFS program in the supply chain of metals from mines to final OEM products.

Protocols have been developed by the program that describe compliance expectations for smelters and refiners, and define rules for auditors to check facility compliance. The protocols include requirements such as:

- Implementation of a conflict free policy which is embedded into internal operating practises;
- Mechanisms for tracing origins of purchased materials back to sources including shipping documents, information on assays and mine identification;
- Tracking of paperwork both internal and external to the smelters/refiners;
- Criteria to exclude low-risk materials from sourcing requirements, for example materials identified as recycled;
- Procedures for dealing with minerals and metals that are inventoried for longer periods of time, and which therefore may not have the same paperwork to meet compliance. [13]

The protocols are structured based on risk to provide for greater rigour and scrutiny (e.g., level of documentation and degree of audit sampling) for higher risk shipments sourced from areas more likely to be associated with the conflict areas: low risk countries are classified as Level 1, with Level 2a and Level 2b each presenting higher risks and greater audit requirements, and with the DRC itself categorised as Level 3 [13].

Figure 2 also illustrates the placement of other mechanisms that have been developed to complement the CFS program. At the bottom of the value-chain, in-region initiatives operate in the DRC, Rwanda and other countries in the Great Lakes Region of Africa and include chain-of-custody programs to track minerals from mines (e.g., [8]). At the other end of the value-chain, electronics OEM companies employ a "reporting template" that is passed up the supply-chain to obtain information on the source of metals from smelters and refiners [11]. The aim is to provide chain-of-custody assurance that metals in final products are from CFS compliant smelters and refineries. The coordination and effectiveness of these programs individually and jointly with the CFS are areas of future research.

2 Successes and Challenges of the Program

The CFS has demonstrated that it is possible to identify sources of metals entering smelters and refiners. Figure 3 shows progress to July 2012 of the CFS program in identifying and auditing smelters and refiners for the four conflict minerals: compliant sites have passed facility audits; active participants refers to facilities that have entered but not completed the audit process; and the total number of facilities to be audited is estimated by CFS. Independent data published by Apple Inc. in their Supplier Responsibility 2012 Progress Report [14] are also shown. For Au, Sn and W, a small fraction of identified smelters/refiners have been audited. Data suggest that Ta producers are successfully qualifying as conflict free: the program has identified 18 countries that supply conflict-free Ta minerals, including some mines in the DRC.

Smelters and refiners typically fail their first audits, often due to poor understanding of the CFS program and inadequate information management systems. A 90 day period is provided for processors to perform corrective actions such as obtaining specific transport records for identified shipments.

A major challenge has been the presence of metal traders that do not process materials but nonetheless participate in the supply-chain and may complicate and even obscure the chain-of-custody of materials due to commercial confidentiality.

To date, most facilities that have successfully complied with the CFS are sourcing materials from low risk Level 1 countries. Metals facilities vary tremendously in the numbers and types of shipments they receive. For example, one large smelter located in Asia receives all of its input materials from a single nearby mine, with no mixing of mineral ores or input of materials from other locations. In another example, a gold refining facility was found to source from several large regional mines and from buyers of used gold and jewellery. One refinery received shipments from a government-run mining authority from a Level 1 developed country. The audit discovered that each shipment from that country contained materials sourced from as many as 20,000 artisanal and small-scale miners. The information in the audit went so far as to reveal the personal names and production volumes of individual miners in the source country.

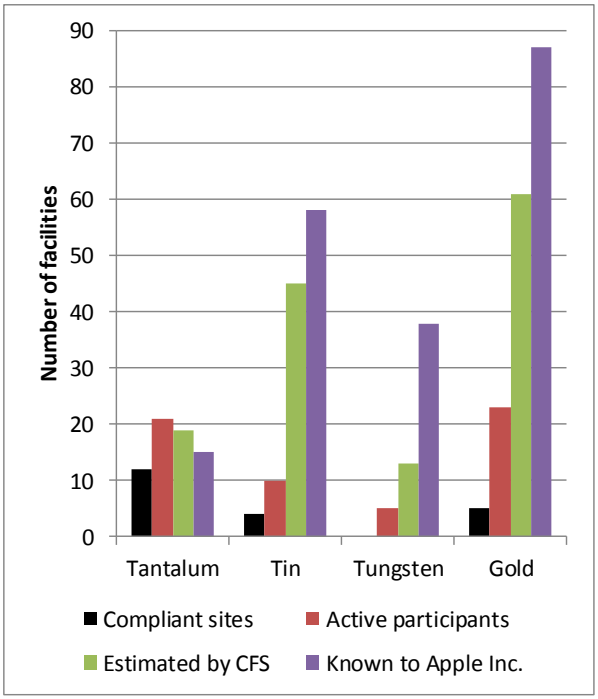

Figure 3: Numbers of facilities compliant, known and projected for CFS program (July 2012) [11], [14].

3 Analysis

3.1 CFS as novel Corporate Social Responsibility

From a business management perspective, the CFS program represents a novel mechanism of corporate social responsibility (CSR) and supply-chain sustainability management, which can be described as a Non-state Market-Driven (NSMD) initiative [15]. NSMD initiatives are typically driven by industry associations and corporate codes of conduct, with stakeholder groups include in the program governance [16]. Further, compliance must be verified and the system is prescriptive, involving mandatory behavioural requirements for participating firms to follow, thus creating obligations and legitimacy for the initiative.

In the case of the CFS, OEMs have voluntarily collaborated to develop a NSMD program. NGO stakeholders are not included in the program management but are formally consulted on a regular basis. The CFS program is distinct as a governance system as it aims to control aspects of social performance in firms that are many tiers deep in the OEM's value chains—the mining and metals sectors is far removed from the sphere of direct influence of the electronics sector.

3.2 Compliance vs. certification

Comparable sustainability management certification initiatives include the Forest Stewardship Council, Marine Stewardship Council, and Fairtrade Labelling Organizations. However, unlike other commodity systems the CFS is facility-based not product-based. It does not certify the metal product; rather it confirms the compliance of a production facility over a period

of time. Moreover, as it is currently structured, the CFS program provides limited transparency on the commodity. The core information conveyed with conflict-free compliance is the absence of a negative attribute at a facility ("conflict" at the smelter), as opposed to the presence of positive attributes (e.g., "sustainable") that are more commonly considered in the sustainability certifications of products. Information from the CFS is made available to buyers in the manufacturing supply chain. As such, the CFS is not a full chain-of-custody, like certified wood or organic food, nor does it consider the end-of-life of electronics.

3.3 Possibilities for expansion

The CFS metal traceability concept can be expanded and the program already includes OEMs in other sectors, like automotive and jewellery [11]. Some NGO and government stakeholders have expressed interest in expanding the program to address more conflict zones around the world, or to other mining sectors. There is also a possibility to expand the framework to cover additional sustainability issues, including broader social and environmental aspects of metals and mining. Of importance will be evaluation of the efficacy and efficiency of the CFS towards addressing including consideration of the benefits and costs involved.

4 Conclusion

The CFS is a novel industry-lead initiative in corporate social responsibility. The program includes protocols and site audits to monitor and trace supply-chain flows of metal sources. In its first two years of operation, despite significant challenges, the program has demonstrated that it is possible to track metals and to confirm their traceability at smelters and refineries. The program will expand to cover more of the world's production of Au, Sn, Ta and W. There are also possibility of using the mechanism to address other sustainability issues related to metals and mining.

5 Disclosure statement

S.B. Young is a member of the Audit Review Committee of the EICC and GeSI Conflict Free Smelter Program.

6 Acknowledgments

The authors recognise the cooperation of the EICC and GeSI Conflict Free Smelter Program in this research.

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