

China and Congo's coltan connection

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For almost 10 years, conflict minerals have sustained a devastating war in the Democratic Republic of Congo (DRC) that has led to over 5.4 million deaths.¹ During these years, the world has continued to consume products made with minerals such as coltan from the DRC as the complex global supply chain diffuse corporate social responsibility and accountability. The recent introduction of the bipartisan Congo Conflict Minerals Act of 2009 in the U.S. Senate highlights the human consequences of armed groups profiteering from the sale of illicitly mined coltan. From the DRC, coltan is exported to facilities, such as Ningxia Non-ferrous Metals Smeltery in China, for processing and is manufactured into consumer and industrial goods sold in North America and Europe.²

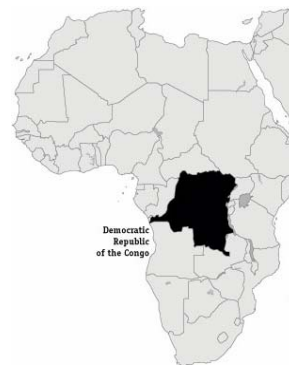
In the past, many armed groups have profited from valuable minerals and prohibited substances. Notable examples include the Taliban who used opium to finance its war in Afghanistan and the “blood diamonds” that funded multiple armed groups in West Africa. However, unlike drugs and diamonds, coltan from the DRC is sold to consumers in innocuous electronic products such as cell phones, laptops, video game consoles and mp3 players. Increasingly these high tech products have become the backbone of Asian manufacturing with many components made and assembled in East Asia. In particular, China has become a significance force in the market and its increasing share in the global electronics production has inevitably linked it to conflicts such as in the DRC.

China's consumption of coltan is part of its “go global” strategy of sourcing overseas raw materials, particularly from Africa. The lack of transparency in China's resource contracts with the DRC government mirrors its purchases of strategic minerals mined outside government regulated sources. The recent \$9 billion resource deal with the DRC government, in exchange for infrastructure development, has been criticized by the IMF for risking further government debt if the mines

fail to reap expected profits. Similarly, China's purchase of minerals from sources linked to armed groups further entrenches the opaque nature of the conflict mineral trade and ultimately finances the rebel groups that create insecurity within the DRC.

What is coltan?

Coltan is short for columbite-tantalite, a naturally occurring metallic ore from which valuable tantalum is extracted for a variety of uses. The primary end use of tantalum is for capacitors in electronic circuits as its high capacitance property allows the storage and instantaneous release of electric charge with minor power loss. Tantalum is also in demand by the defense, aviation and medical technology industries for its resistance to extreme heat and chemical corrosion, hardness and ductility.

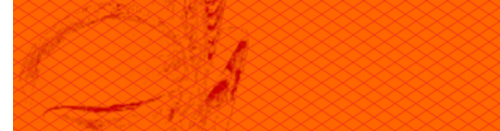


“Without knowing it, tens of millions of people in the United States may be putting money in the pockets of some of the worst human rights violators in the world simply by using a cell phone or laptop computer”

Richard Durbin, Senate Majority Whip

“Blood coltan”

The DRC is a Central African nation slightly less than one quarter of the size of the United States. The ‘resource curse’ has plagued the DRC as its resource wealth was systemically exploited by Belgium from the late 19th century and then by kleptocratic governments and rebel forces since its independence in 1960.



During the 1990s, the DRC was destabilized by the influx of Rwandan refugees following the 1994 genocide, routine encroachment by rebel forces from neighboring countries and a brutal civil war from 1996 to 1997. These events set into motion the dynamics of the Second Congo War, also termed Africa's 'world war' as it involved eight countries and over 20 armed groups. From 1998 to 2003, the DRC government, aided by troops from Angola, Zimbabwe, Chad and Namibia

Coltan from the DRC has also been smuggled to neighboring Rwanda and Uganda. Official statistics from both countries, which have limited indigenous coltan resources, indicate an escalation of exports during periods of fighting in northeastern DRC.⁶ Rwandan President Paul Kagame even called the war "self-financing" due to the mineral profits, estimated to be up to \$20 million per month at one point, which sustained the Rwandan army.⁷



Above: Coltan mining in the DRC.
Source: Fauna and Flora International.

Right: A child soldier in the DRC, 2003.
Source: Reuters.



"Conflict resources are natural resources whose systematic exploitation and trade in a context of conflict contribute to, benefit from or result in the commission of serious violations of human rights, violations of international humanitarian law or violations amounting to crimes under international law."

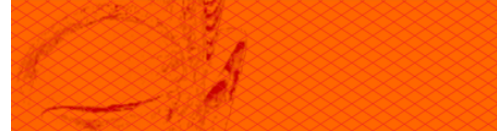
- Global Witness.

fought invading armies from Uganda and Rwanda as well as their respective proxy militias. This conflict was intensified and sustained by the 'coltan rush' from global electronics demand as the foreign fighters and militias sought control of minerals as a means of financing their operations.

Numerous U.N. and NGO investigations have concluded that competition between armed groups over resources such as tantalum has been a significant driver of the conflict.³ Groups including the Democratic Forces for the Liberation of Rwanda (FDLR), National Congress for the Defense of the People (CNDP) and factions of the Congolese army (FARDC) taxed the mines and population as well as extorted minerals or cash at transit points for profit.⁴ The problem of illicit mining was also compounded by the DRC government's inability to secure the proliferation of small-scale mining.⁵

The Second Congo War was the deadliest conflict since World War II with over 5.4 million casualties.⁸ Although it officially ended in 2003, ongoing fighting between the DRC government and various rebel factions still claim an estimated 1,500 lives per day from war related causes.⁹ Former U.N. Under Secretary General Jan Egeland called it the "biggest, most neglected humanitarian emergency in the world today," with a death toll far surpassing that of Darfur.¹⁰

Widespread and ongoing human rights abuses documented in the DRC since 1998 include the extensive use of child soldiers and labor, indentured labor, gender-based violence and mutilation against women and children as well as indiscriminant and unlawful killings. These atrocities have been attributed to almost all the armed groups in the conflict, some of which, like FDLR, are still active in eastern DRC today.



Global tantalum supply

Mining provides almost three quarters of the world’s tantalum supplies and the rest comes from scrap metals, tin slag processing, and existing inventories. Global tantalum supplies in 2008 totaled to an estimated 4.3 million pounds (as measured in the most common form of tantalum pentoxide, Ta₂O₅).¹¹ Currently, Africa and Australia are the top contributors to global supply, accounting for approximately 30% each; this is followed by Brazil at 15% and China at 8%.¹² It is also important to note that a significant proportion of Central Africa’s tantalum exports are likely to have originated from the DRC.

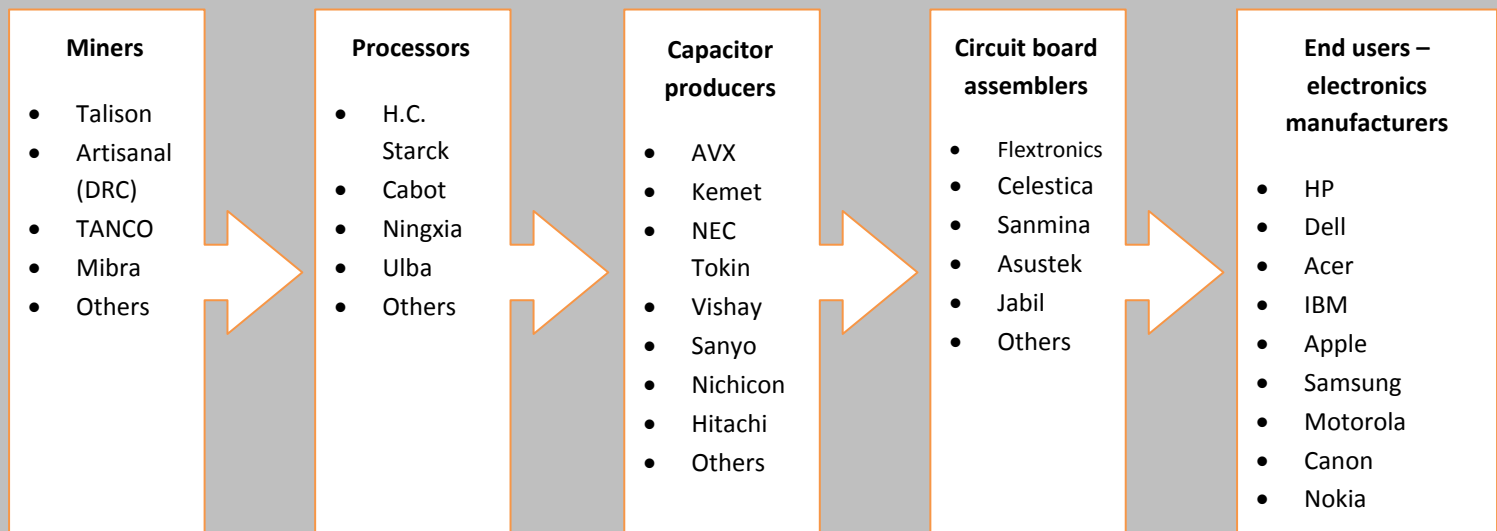
The supply chain: from Congo to consumption

Coltan from the DRC passes through at least ten intermediaries¹³ from supply to consumption and is a significant part of the billion dollar tantalum industry.

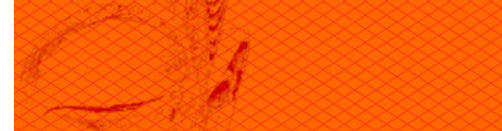
First, the coltan is mined in small, manual operations and transferred through several intermediaries in the country who consolidate the ores and negotiate the sales. *Negociants*, intermediaries near the mine site, sell

the ores to *comptoirs*, buying houses in urban centers that are often connected to rebel forces, which then export the ores. A U.N. investigation found that many *comptoirs* knowingly purchase coltan from areas controlled by armed groups and exploit the distinction between themselves and the *negociants* to claim ignorance of the ores’ origin. International companies then transport most of the ore either directly, or re-exported via Uganda and Rwanda, to overseas processing facilities.¹⁴ The cross border smuggling of coltan has also been driven by economic incentives as the export tax from eastern DRC is greater than that of nearby countries.¹⁵

The processing phase is the bottleneck of the supply chain as 80% of the ore is consumed by three key processors: the U.S. based Cabot Corporation, German based H.C. Starck and the Chinese state-owned Ningxia Non-ferrous Metals Smeltery (NNMS).¹⁶ While Cabot and H.C. Starck have both issued policies against the use of coltan from the DRC, a U.N. investigation in 2002 confirmed that Ningxia sourced up to 50% of its tantalum ores from Central Africa.¹⁷ More recently, the 2007 U.N. Comtrade data supported industry claims that China is now the primary consumer of DRC’s coltan exports.¹⁸ Import data from the same year suggests that the majority of China’s ore imports were destined for the NNMS.¹⁹



The supply chain for tantalum powder production. Source: Talison



This reflects a growing trend of tantalum exports to Asia, particularly to China. The Semiole Group in Colombia recently announced that they are targeting Asian buyers with their new tantalum mine as most of the world's tantalum ores "end up in countries like China."²⁰

Tantalum as a strategic resource

Many countries have deemed tantalum to be a strategic resource. The recent [Report to Congress on National Defense Stockpile Reconfiguration](#) listed tantalum as an important mineral to strategic defense interests. Currently, tantalum supplies are vulnerable to peace time supply disruptions and reserves are below four thousand pounds with one hundred percent dependency on imports. While the U.S. has been the most significant consumer and producer of strategic minerals in the past, increased global competition – particularly from China – for raw materials has challenged the strategic viability of importing vital minerals. In the long term, the U.S. will need to address mineral supplies and resource scarcity as part of its [national security strategy](#).

In China, the tantalum industry is dominated by profitable state owned enterprises and has been linked to defense manufacturing. The primary tantalum processor [Ningxia Non-ferrous Metals Smeltery](#) (NNMS) also includes China's only research center and production base for beryllium, which was allegedly involved in [hydrogen bomb](#) production.

In 1999 NNMS sponsored the creation of the publicly traded [Ningxia Orient Tantalum Industry Co. Ltd](#) (OTIC). OTIC's total assets are now estimated to be over [1.6 billion yuan](#) (US\$234 million) and tantalum products accounts for almost [three quarters](#) of its sales. OTIC also holds a second-class security clearance for their role in China's [weapons manufacturing](#) process. In the same news update on their website, OTIC states that its defense role involves supporting China's Commission of Science, Technology, and Industry for National Defense and the State Administration for Science Technology and Industry for National Defense. OTIC's primary stakeholder, the [CNMC Ningxia Orient Group Co. Ltd](#), was created in 2008 and is under direct administration by the State-owned Assets Supervision and Administration Commission of the State Council.

Over half of tantalum ores are eventually processed into electronics grade powder or wires.²¹ NNMS states that it exports the processed tantalum to capacitor producers in the U.S., Europe, Israel, Japan and South Korea.²² Leading global capacitor producers include the U.S. based Kemet and Vishay, the U.K. based AVX and NEC in Japan, which together accounted for 65% of market share in 2008.²³ Vishay was also allegedly involved in the development of NNMS and its 2008 annual reported stated that it generates almost 20% of its revenue from capacitors.²⁴

Lastly, U.S. and Asia based companies assemble the capacitors into circuit boards for familiar brand names such as Sony, Toshiba, Dell, HP and Samsung. After the extraction phase, the tantalum supply chain is exclusively contained within the U.S., Europe and Asia, allowing manufacturers to plea plausible deniability on use of coltan from the DRC.

Supply disruptions cause heightened demand for DRC coltan

Two recent disruptions in the international supply chain have shifted production towards Central Africa. In early 2007, U.S. Defense Logistics Agency, which has released almost half a million pounds of tantalum to the global market each year from its Cold War stockpile, depleted its inventory.²⁵ In December 2008, Australian mineral giant Talison suspended operations at its Wodgina mine that had previously supplied over 30% of the world's tantalum ore. The company claims that the mine will recommence production once the global economic situation and demand improves.²⁶

The loss of two major suppliers is likely to lead to greater procurement from the DRC, particularly as tantalum prices increase in reaction to the decrease in global supply.²⁷ It is warned that without Talison, the "majority of the world's tantalum will come from irregular and unreliable suppliers from political unstable regions, with much of it coming from the DRC."²⁸ Therefore, until security is restored in the DRC, the willingness of buyers to procure conflict tantalum will

perpetuate this cycle of armed groups profiteering at the expense of the civilian population. In addition to the humanitarian consequences, this practice is also disadvantageous for the supply chain in the long term.

For manufacturers, sourcing from an unstable region will increase vulnerability to price and supply fluctuations. In addition, they will also risk their brand prestige and consumer goodwill which can diminish their competitive edge in the global market. Advocacy groups have urged consumers to exercise greater caution in purchasing electronic goods and proactive measures by manufacturers can help avoid calls for industry boycotts such as the backlash against “blood diamonds.”

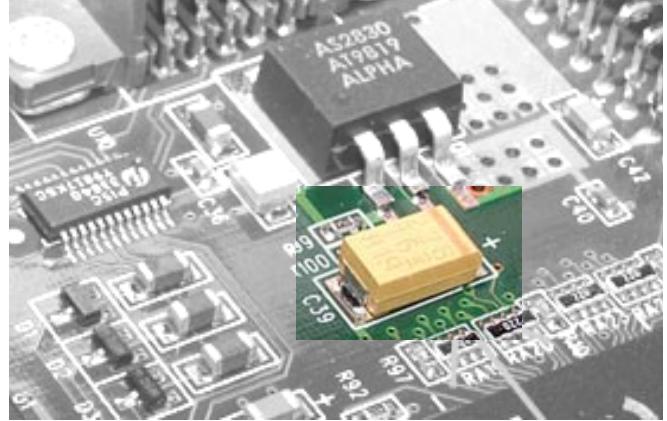
Increasing demand for tantalum

Since 1990, tantalum demand has increased by an average of 6% per year and is expected to recover to similar levels after the current downturn. In the future, demand from the Asia Pacific boasts the highest potential with an estimated growth of 6.75% towards 2010.²⁹

Currently, many manufacturers are relying on existing tantalum inventories, partly in response to dampened consumer demand, rather than purchasing tantalum at a higher price or from questionable sources. However, it is projected that this inventory will only be sustainable to the end of 2009, after which, manufacturers will have to bolster their tantalum supplies. The resultant deficit in the short term is expected to culminate in an escalation of demand to 6.95 million pounds in 2012.³⁰ In the long term, a widened supply base may stabilize this imbalance as promising new mines in Egypt, Saudi Arabia and Canada come into operation.³¹

Future demand for tantalum capacitors are expected to remain level as most alternatives are currently unable to match tantalum for its efficiency, size and relatively low cost. One the strongest competitors to tantalum is the multilayered ceramic chip capacitors that Samsung has invested in to help meet demands and avoid controversies over its products. However, the industry

trend toward alternatives and miniaturization is countered by a shift toward larger tantalum capacitors due to higher frequency requirements in new electronic products.³²



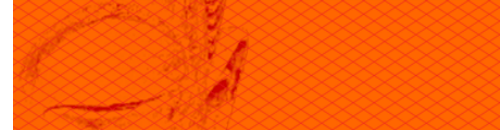
Tantalum capacitor in an electronic circuit. Source: Capacitor Lab

The strongest area of growth for tantalum will be in nickel-based super alloys for the aeronautics industry, notably in the production of turbine engines. Currently, super alloys accounts for 15% of tantalum end-use and is projected to increase as Boeing and EADS fulfill orders on the 787 Dreamliner and Airbus.³³ China also drives the market with orders for 62 Boeing 787-8 planes from its commercial airlines.³⁴

Other significant drivers of demand will be hard metal cutting tools, commonly used in automotive production, which is forecasted to rise with developing industries in China and India. In addition, the medical technology industry will increasingly capitalize on tantalum’s non-toxic and inert properties for applications in implants and joint replacement fixtures.³⁵

Addressing conflict tantalum

Initiatives on managing conflict resources could also play a significant role in the future of DRC’s coltan trade. Advocates have called for a Certified Trading Chain, like the Kimberly Process for “blood diamonds,” to reduce the purchase of conflict tantalum. Recent developments in scientifically “fingerprinting” the origin of tantalum ores will be vital to supporting a more



transparent supply chain. The scheme is anticipated to be finalized later this year and will, if successful, encourage legitimate mining operations to allow the mineral wealth to benefit the population and the government.

Together with governance, security sector and trade reforms, such initiatives can help channel the trade from conflict and towards development.³⁶ Within the DRC, further efforts are required to bolster the government's ability to effectively tackle the monopoly of violence as weaknesses in governance have facilitated the conflict minerals trade.

At the other end of the supply chain, combined U.N. reporting and NGO pressure have been successful in securing pledges from companies such as Motorola, Apple, HP and Nokia against use of DRC tantalum. However, the lack of an independent verification mechanism means that there are no uniform standards for following through with such policies. A certification and "fingerprinting" scheme will create genuine pressure for manufacturers to enforce their policy of non-procurement from the DRC. Through this scheme, manufacturers can demand their suppliers provide certification to demonstrate that their raw materials did not originate from the conflict areas in the DRC.

The focus of public pressure against electronics manufacturers reflects the role of the international private sector in human security. While governments and international institutions should be part of the solution, multinational companies and global consumers, who hold the ultimate purchasing power, may prove to be the most able to enact real changes by demanding conflict free materials from producers throughout the supply chain.

China and conflict minerals from the DRC

As China holds an increasing share of global electronics production and represents a growing consumer market, it has the potential to complement the efforts of Western organizations and the DRC's own efforts at cracking down on the conflict mineral trade. The state

controlled supply chain may facilitate implementation of regulatory measures to monitor raw materials. However, the organizational structure means that an effective strategy would need to target complex policy motivation for procuring resources from abroad in addition to social responsibility.

To this end, action by consumers and manufacturers may be the catalyst in generating the necessary momentum that will resonate down the supply chain. Efforts to reduce demand for conflict minerals through supply chain transparency are crucial steps towards ending the cycle of violence supported by mineral profits.

Looking forward, greater focus on the tantalum supply chain may bring attention to other DRC resources that the U.N. and leading advocates have deemed as conflict minerals. While tantalum represents an alarming link between global consumption and human insecurity in Central Africa, the [Enough Project](#), [Global Witness](#) and the [Pole Institute](#) have also identified other minerals including cobalt, cassiterite (tin), tungsten and gold as drivers of conflict in the DRC.

¹ Estimate by the International Rescue Committee in "IRC Study Shows Congo's Neglected Crisis Leaves 5.4 Million Dead", Jan 22nd 2008, <http://www.theirc.org/news/irc-study-shows-congos0122.html>. This statistic is used by the Congressional sponsors of the *Congo Conflict Minerals Act of 2009*.

² Enough Project, "A Comprehensive Approach to Congo's Conflict Minerals", <http://www.enoughproject.org/publications/comprehensive-approach-conflict-minerals-strategy-paper>.

³ There is a "clear geographical correlation between the activities of illicit armed actors and areas of natural resource exploitation. Control over territory has proven to be the key factor enabling armed groups in the Democratic Republic of the Congo to profit from the exploitation of natural resources". United Nations Security Council, "Interim report of the Group of Experts on the Democratic Republic of the Congo, pursuant to Security Council resolution 1698 (2006)" (S/2007/40), January 31st 2007, <http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/DRC%20S200740.pdf>

⁴ James Karuhanga. "Congo-Kinshasa: FDLR Violence Soars in DRC." *The New Times*, June 3rd 2009, <http://allafrica.com/stories/200906030002.html>; United Nations Security Council, "Final report of the Group of Experts on the Democratic Republic of the Congo" (S/2008/773), December 12th 2008, <http://www.undemocracy.com/S-2008-773.pdf>.

⁵ United Nations Security Council, "Interim report of the Group of Experts on the Democratic Republic of the Congo, pursuant to Security Council resolution 1698," 2006.

⁶ Uganda reported 2.5 tons of coltan exports a year before the conflict and in 1999, this jumped to exploded to nearly 70 tons. Kristi Essick. "Guns, Money and Cell Phones." *The Industry Standard*, June 11, 2001, <http://www.thestandard.com/article/0,1902,26784,00.html>. In 2002, 70 per cent of the coltan exported from DRC was mined by the Rwandan army. Stephen Hutcheon. "Out of Africa: the blood tantalum in your mobile phone." *The Sydney Morning Herald*, May 8, 2009, <http://www.smh.com.au/news/home/technology/blood-tantalum-in-your-mobile/2009/05/08/1241289162634.html>.

⁷ Fabienne Hara. "Hollow peace hopes in shattered Congo." International Crisis Group, available at <http://www.crisisgroup.org/home/index.cfm?id=2216&l=1>; Päivi Pöyhönen and Eeva Simola. "Connecting component dividing communities." FinnWatch, December 2007, <http://makeitfair.org/the-facts/reports/Connecting-Components-Dividing-Communities.pdf>.

⁸ International Rescue Committee. "IRC Study Shows Congo's Neglected Crisis Leaves 5.4 Million Dead."

⁹ Robin Wright Penn and John Prendergast. "Cell phones and Congo's war against women." *The San Francisco Chronicle*, January 7, 2009, <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2009/01/06/ED2T153V10.DTL>. The authors also called the DRC the world's "most dangerous place to be a woman or girl" as the country has the highest rates of sexual violence in the world.

¹⁰ The United Nations. "Eastern DR of Congo surpasses Darfur as biggest, most neglected emergency – UN relief official." March 16, 2005, <http://www.un.org/apps/news/story.asp?NewsID=13675&Cr=democratic&Cr1=congo>.

¹¹ Paul Wallwork. "Challenges Facing the Tantalum Industry," Presentation at the Minor Metals and Rare Earths Conference, September 2008, <http://www.talison.com.au/news.html>.

¹² Noventa. "Introduction to Noventa," Presentation on March 26, 2009, http://noventa.net/pdf/Proactive_Investors_Presentation_26March2009.pdf.

¹³ Kristi Essick. "Guns, Money and Cell Phones."

¹⁴ United Nations Security Council. "Final report of the Group of Experts on the Democratic Republic of the Congo" (S/2008/773) & Enough Project. "A Comprehensive Approach to Congo's Conflict Minerals."

¹⁵ Enough Project. "A Comprehensive Approach to Congo's Conflict Minerals."

¹⁶ Antonio Ruffini. "Africa Remains Key to Future Tantalum Supply." *Engineering and Mining Journal*, (2008): 68-72.

¹⁷ United Nations Security Council. "Final report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of DR Congo." (S/2002/1146), October 16, 2002, <http://www.reliefweb.int/rw/rwb.nsf/AllDocsByUNID/706b89b947e5993dc1256c590052b353>.

¹⁸ Jack Ewing. "Congo Fighting Revives Tainted Phone Fears." *Business Week*, November 17, 2008, http://www.businessweek.com/globalbiz/content/nov2008/gb20081117_671426.htm?chan=top+news_top+news+index+-temp_global+business.

¹⁹ Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013." *Paumanok Publications Inc*, August 2008.

²⁰ "Seminole Group Colombia Starts Selling Tantalite to Chinese Buyers." February 1, 2009, <http://www.prlog.org/10175617-seminole-group-colombia-starts-selling-tantalite-to-chinese-buyers.html>.

²¹ Paul Wallwork. "Challenges Facing the Tantalum Industry."

²² Ningxia Non-ferrous Metals Smeltery, <http://www.nniec.com/aboutus.htm>.

²³ Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013."

²⁴ Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013." & Vishay Intertechnology Inc. "2008 Annual Report.", <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MT1M3xDaGlsZEIEPS0xfFR5cGU9Mw==&t=1>.

²⁵ The Defense Logistics Agency is an agency within the Department of Defense which supports the military in weapons and material procurement. For more information, please see <http://www.dla.mil/default.aspx>. Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013."

²⁶ Talison. "Talison to suspend Wodgina tantalum operations." November 26, 2008, http://www.talison.com.au/pdfs/Media_Release_26_Nov_08_FINAL.pdf.

²⁷ Marc Davis. "'Blood tantalum'" profiteers in Congo set to capitalize on tantalum price instability in 2009." *Small Cap Media*, November 28, 2008, http://www.proactiveinvestors.com/genera/files/sponsor_files/commerce_blood_tantalum_smallcappager_nov288.pdf.

²⁸ Talison Chief Executive Peter Robinson, cited in "Talison to suspend Wodgina tantalum operations."

²⁹ "Global Tantalum Market to Exceed 6.95 Million Pounds Lbs. by 2012, According to New Report by Global Industry Analysts, Inc." October 28, 2008. *PRWeb*, <http://www.prweb.com/releases/tantalum/metal/prweb1530774.htm>.

³⁰ Ibid & Tim Vulcan. "Tantalum: A Modern Metal, Actually." *Hard Assets Investor*, January 13, 2009, <http://www.hardassetsinvestor.com/features-and-interviews/1/1376-tantalum-a-modern-metal-actually.html>.

³¹ Roskill Information Services, "New sources of supply could eliminate price fluctuations," <http://www.roskill.com/reports/tantalum>.

³² Spencer Chin. "Rising competition, price erosion continue to roil passives makers." *EE Time Supply Network*, April 14, 2003, <http://eetimesupplynetwork.com/showArticle.ihtml?articleID=8800015>.

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³³ Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013."

³⁴ Boeing, "Boeing's orders and deliveries information (as of May 2009)," <http://active.boeing.com/commercial/orders/index.cfm>.

³⁵ Dennis M. Zogbi. "Tantalum: Global Market Outlook: 2008–2013." & "Tantalum", *Metal bulletin Monthly*, February 2006, <http://www.metalbulletin.com/Article/1446931/Tantalum.html>.

³⁶ For more, please see Nicholas Garrett and Harrison Mitchell, "Trading Conflict for Development," April 2009, http://resourceglobal.co.uk/index.php?option=com_docman&task=catview&gid=34&Itemid=41.