

Case studies: Sustainable solutions for transforming the smartphones and ICT sector

Getting responsibly-sourced materials into electronics

Materials used in ICT equipment are widely known to be associated with devastating environmental and social impacts. [Representing 7.5% of global demand for gold](#), electronics are a major user of metals and minerals whose mining and processing involves huge inputs of energy, water, toxic chemicals and often unsafe labour. Global trade of some commonly-used metals is funding decades-long armed conflict in politically unstable regions such as the DRC (Democratic Republic of Congo). Tin, tantalum, tungsten and gold – a.k.a. 3TG – have been the focus of most scrutiny. These ‘conflict minerals’ are linked to violence, corruption, forced labour, child labour, unsafe conditions and other human rights violations. Artisanal, small-scale mines are most at risk of these unsafe conditions, which are especially typical for tantalum due to the way it is geologically deposited. Because the mining often takes place in areas where legal enforcement is weak or absent, it is often carried out with no regard for environmental harms and related health impacts – e.g. toxic pollution, deforestation and CO₂ emissions.

3TG have become subject to legislation in the USA (Dodd-Frank Act 2010) and EU (Conflict Minerals Regulation 2017). These require companies to investigate and disclose which countries they source 3TG from, and report the measures taken to reduce the risk of funding conflict ([e.g. following OECD](#)

[guidelines](#)). The Dodd-Frank act names specific countries as high-risk – [causing many manufacturers to abandon these sourcing locations to reduce their due diligence burden](#). This puts thousands of impoverished miners out of work and makes them more vulnerable to militia control, while the minerals may simply be illicitly exported via ‘safe’ countries. EU legislation aims to avoid this effect by not naming particular places as high-risk, instead offering [guidelines to help identify them](#). While only 3TG is the focus of legislation, cobalt and copper are also [associated with conflict and human rights violations](#).

OECD due diligence guidance for responsible mineral supply chains

- Developed via an intergovernmental process, this guidance forms the core of most conflict minerals legislation and industry efforts
- Designed to help companies respect human rights and avoid funding conflict through their mineral sourcing practices
- Aims to cultivate transparent supply chains and let countries with mineral resources gain the benefit of extracting them
- Gives a five-step framework to identify the risks of contributing to conflict and human rights violations in their mineral supply chain, mitigate those risks, set up independent audits, and report
- Voluntary guidance – not legally mandatory
- Covers all minerals, with extra guidance for 3TG.

Trading of these materials via global commodity markets reduces transparency, making it difficult to establish their origins. While US legislation focuses on the DRC and its neighbours, industry analysis in 2017 has concluded that 3TG are now entering electronics supply chains from other conflict zones (e.g. parts of Colombia and Myanmar) – [and other areas with similar risk for child labour and forced labour](#). Meanwhile, e-waste may be the world's fastest-growing waste stream, and [only 20% of it is known to be properly recycled](#). With increasing consumption of ICT per capita worldwide, this indicates a growing throughput of raw materials whose environmental and social impacts are understood to be serious.



Image credit: Fairphone

Reaching the source: hands-on, not the cold-shoulder

Rather than turning away from sourcing locations that are deemed high-risk, some industry partnerships have decided to get hands-on to improve conditions and connect responsible miners to global demand. This way, mining communities in 'high-risk' countries earn vital income, while industry alliances engage with them to improve practices while keeping a close eye on avoiding funding conflict. The aim is to show the industry that it is possible to source responsibly (as per OECD guidelines) from 'high risk' locations.

One example is the Conflict Free Tin Initiative (CFTI). From 2012 to 2014, this project used an existing tin industry programme to work towards due diligence and traceability in Kivu, an area of DRC that was hit particularly hard by buyer withdrawal after the Dodd-Frank Act. The CFTI assembled a range of partners from mines and manufacturers to NGOs to verify, set up and monitor a traceable, conflict-free tin supply chain from Kivu. This contributed to formalization of mining, [which in turn helped](#)

[improve working conditions](#). The learnings informed the ongoing work of iTSCi (below) and others.

Various multi-stakeholder industry-based organisations are taking a related hands-on approach to improving the sourcing of minerals from so-called high-risk locations. Examples include:

[Alliance for Responsible Mining](#)

- Focuses on artisanal and small-scale mining (ASM)
- Created the '[Fairmined](#)' standard – a certification label for precious metals – which has [two levels](#), basic and ecological (with stringent environmental elements)
- Works to directly support ASM mining communities and promote public policies to include them
- Can consult to analyse existing supply chains, work directly with specific miners, or set up responsible supply chains for gold
- Builds influence via online educational resources and alliances/partnerships.

[iTSCi](#)

- Works to build responsible, transparent mineral supply chains – in the market and on the ground
- Works with any size company in all parts of mineral supply chain to help them achieve full due diligence in line with regulation
- Focuses on minerals from DRC, Burundi, Rwanda and Uganda
- iTSCi's 'upstream programme' was the basis of the Conflict Free Tin Initiative (above)
- Originally a tin industry initiative, now includes tantalum and tungsten.

[Responsible Minerals Initiative](#)

- Set up in 2008 by electronics industry bodies but now open to many sectors
- Offers its members access to various resources to support compliance, due diligence and reporting

- Special focus on smelters and refiners as the key point in the supply chain, who are in a strong position to know the origin of raw materials. There is a small number of them worldwide, so they can be efficiently and effectively audited.

Some manufacturers have adopted this hands-on approach to minerals sourcing, or work directly with the above initiatives to comply with legislation while supporting mining communities in Africa's Great Lakes region. Perhaps the best-known example is Fairphone. Having started in 2010 as a [campaign for awareness of conflict minerals](#), in 2013 Fairphone became "[a social enterprise that makes smartphones to create an impact in the electronics supply chain](#)". It worked with the CFTI (above) and [Solutions for Hope](#) to source conflict-free tin and tantalum. Later Fairphone conducted research trips to Rwanda – which had also been impacted by Dodd-Frank legislation – and then engaged its components suppliers to source tungsten from responsible Rwandan suppliers via a smelter in Austria.

Other key materials required a different approach, as there was a lack of conflict-free gold supply chain initiatives in 'high-risk' locations. Instead, with the help of Fairtrade Netherlands, Fairphone found a source of Fairtrade gold in Peru. By collaborating with three tiers of its supply chain, Fairphone was able to use this gold in its phones through a company that supplies gold salt for printed circuit boards (PCB). A key to success was that the PCB manufacturer was also interested in exploring a Fairtrade gold supply. This is the first ever Fairtrade gold supply chain for consumer electronics.

Understanding what is 'material'

Part of the difficulty in creating a more sustainable supply chain lies in the complexity of ICT products. With hundreds of components coming from different and fast-changing supply chains, knowing the product's material content is a challenge. For this reason, some brands are carrying out in-depth analysis to understand what is in the product and which materials require most urgent attention. One



Image credit: Alliance for Responsible Mining

example is Apple, [which announced it has analysed 45 materials, but has not published the results](#). Another is Fairphone, [which published an analysis of 38 materials typically present in smartphones](#). Each material is given ratings of low, moderate, high or very high impact across 14 different criteria. The criteria range from how crucial a material is for consumer electronics, through to what extent a material is associated with conflict and various environmental and health impacts.

This analysis helped to establish which materials to address first – due to their social and environmental impacts, and due to the electronics industry's leverage to demand change in the supply chain. [Fairphone chose ten materials on which to focus its efforts](#): 3TG, cobalt, copper, gallium, indium, nickel, and rare earth metals. Having already looked at 3TG, Fairphone is now able to develop initiatives for better sourcing of other materials.

Responsible resources: raw or recycled?

While responsible sourcing of raw materials is helpful, it does not address the problem of resource depletion or waste. An alternative is to seek recycled materials. For the manufacturer, a major benefit of traceably recycled metals is that they are presumed by default to be conflict-free.

Some manufacturers have started to do this, with Dell using recycled plastic via a take-back scheme, and [Apple committing to recover tin and aluminium as part of its goal to achieve a closed-loop supply chain for all its products](#). Apple has begun to recover materials directly from its own

end-of-life devices by incentivising consumers to return them – [and has built a specialist robot to disassemble them](#). [Fairphone 2 contains recycled tungsten, gold, copper and PC plastic in amounts up to 50%](#). Cofounder Miquel Ballaster has observed that convincing suppliers to seek recycled sources has a lot to do with the price of recycled versus new material. Global commodity trading can erase price differences between some new and recycled materials – like gold – making it difficult to be sure how much of the final product is from a recycled source. However, Fairphone continuously asks questions of its suppliers in order to put this topic on their radar. It is soon embarking on research (with supplier Alpha Assembly) to understand the possibilities for a recycled tin supply chain.

Multiplying impact

With its mission, Fairphone may have more scope to focus on sustainability than conventional consumer electronics companies do. It acts as an expert to give examples of what good practice can look like. However, its leverage in global supply chains is very limited when it acts alone. This is why it is so crucial to have partners – like AT&S, which supplies the industry with printed circuit boards and has enthusiastically taken part in Fairphone’s efforts to explore Fairtrade gold supply chains. Another example is Signify (formerly Philips Lighting). [In June 2018, Signify joined forces with Fairphone](#) to work towards sourcing responsible Congolese cobalt via Huayao, a major global supplier including to Apple. This partnership will work with the [Better Cobalt](#) programme, which uses field agents to engage five small Congolese mines, and technology to trace the progress. The programme intends to monitor and improve working conditions, and ultimately set up fully traceable supply chains from these mines, meeting OECD guidance. [To sum up, Fairphone’s cofounder states](#): “We define success by making an impact that goes far beyond Fairphone ... We work to make other manufacturers view us as sustainable innovators and potential collaborators – not as competitors.”

The message from such initiatives is clear. For truly responsible sourcing of ICT materials, companies must go beyond regulatory compliance. They need to know their product and understand the impacts of its materials. With existing analysis in the public domain, there is a wealth of knowledge available to draw on. With this insight, companies must work directly with their suppliers to understand where key

materials come from. They can then find projects that are already taking steps to make real change in those locations rather than defaulting to what is safe ‘on paper’. Finally, like-minded companies must join forces and use their collective leverage to connect responsible suppliers to a willing market.

Keys to success

- Understanding which materials require urgent attention
- Legislation on conflict minerals that can respond to changing risks
- Manufacturers to trace individual materials step-by-step through the supply chain to identify opportunities for change
- Sourcing according to OECD guidelines on minerals from conflict-affected areas
- Industry initiatives that work to improve the mining situation in ‘high-risk’ locations
- Sourcing from recycled or certified origins (e.g. Fairtrade and Fairmined)
- Manufacturers creating systems to take back their devices at end-of-life
- Collaborating with others to increase leverage through the supply chain.

About Transform Together

[Transform Together](#) works with civil society, governments and businesses to advance sustainable consumption and production in high and middle income countries. Bioregional is the convenor and secretariat of the partnership.

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[Bioregional](#) works with partners to create better, more sustainable places for people to live, work and do business. We call this One Planet Living®.

