



## Electronics Recycling (e-Waste Recycling)

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What to do when our discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, LCD screen and refrigerators when they do not work anymore? We throw them away! But where?

Where does a problem start and where does it end. Normally when human beings do not see the problem anymore it is usually solved. Out of our minds and out of our daily sight somebody else has to care about it.

Some electronic scrap components, such as CRTs, may contain contaminants such as lead, cadmium or beryllium. Even in industrial countries recycling and disposal of e-waste may involve significant risk to workers and communities and great care must be taken to avoid unsafe exposure in recycling operations and leaching of material such as heavy metals from landfills and incinerator ashes..

Worldwide demand for electronic goods is extremely increasing. Tablet computers, for example, are to sell over 100 million in 2012. For sure it will be doubled in the next two years. In 2011 Samsung sold over 300 million cellular phones. Apple sold more than 100 million. Nokia even reached 400 million sold mobile phones. The global market is just exploding.

People in developed countries, are not really trained to refrain from New. Waiver, abandonment or renunciation is not our main strength. We have to have it all!

The recent declines in precious metal commodity prices due to manufacturing declines, the long term trends and the potential demand for newer electronic technologies are unlikely to flat line.

The annual production of electronic goods worldwide requires approximate 320 tons of gold and over 7,500 tons of silver, with a combined value of over \$21 billion dollars. Today less than 10 percent of that is recovered.

E-waste means digging for many substances as the following: substances found in large quantities: fiberglass, PCBs, PVC (polyvinyl chlorides), thermosetting plastics, lead, tin, copper, silicon, beryllium, carbon, iron and aluminum. Elements in small and trace amounts: cadmium, mercury, and thallium, americium, antimony, arsenic, barium, bismuth, boron, cobalt, europium, gallium, germanium, gold, indium, lithium, manganese, nickel, niobium, palladium, platinum, rhodium, selenium, silver, tantalum, terbium, thorium, titanium, and vanadium.

Federico Magalini, a professor of engineering and project manager for the e-Waste Academy said once: there are four kinds of recyclers: “the fool, the criminal, the millionaire and the saint.” The fool and the criminal recycle for profit but without regard to the environmental cost. The millionaire makes money through doing the right thing. The saint does the right thing without needing to make a profit. We want to move everyone to being in the millionaire or saint camp. “We don’t want people burning wire to get the copper,” said Magalini. We want politicians and policy makers to come up with good funding mechanisms for unprofitable but important recycling challenges.

One of our central questions in the near future will be that the cost of mining will increase while the global existence of precious materials will not grow in the same way. Basic costs for raw material will double and triple in the future. There is no other way. We have to find ways to recycle all e-waste. Even in small amounts or in particular where different valuable materials are unified because of the technical claim.

An estimated 50 million tons of e-waste are produced each year worldwide. The Environmental Protection Agency estimates that only 10 - 15% of e-waste is recycled, the rest of these electronics go directly into landfills and incinerators.

The difficulty is not to separate metals, if they are related in their base alloys in large quantities. Especially if they can be separated only in pure alloys by machining mechanically or release them manually. The real challenge is to solve the smallest links and connections and disconnect them in their basic structures. Only a few projects are under development around the world where even the smallest amounts, as braze points, capillary joints, soldered joints and other micro-connections can be brought back to its basic elements.

The topic is huge. Just look it up in internet. Anything you can find. At the end we have to be more conscious about e-waste and question ourselves what is going on with our environment. It is not the responsibility of just one party. Not just the government or the multinational companies, everyone will be confronted with this challenge. We have to find the money to continue hosting e-Waste Academies around the world and to create a means of sharing best practices and translating concepts across cultures.