

New E-Waste Solution a Mine Idea

By [Kendra Mayfield](#)

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Mark Small has a radical solution for dealing with the glut of old computers, cell phones, DVDs and other electronic waste: mining.

Rather than allowing electronic junk to simply amass in landfills, Small wants to deposit huge volumes of e-waste into abandoned open pit mines.

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Using the same techniques that miners use to process copper ore, valuable materials such as copper, iron, glass, gold and plastic could be extracted from electronic scrap.

"The products that we make (in the electronics industry) are made in an incredibly efficient way," said Small, vice president of corporate environment, safety and health for [Sony Electronics](#). "We have to use that same type of philosophy in dealing with the end-of-life issue."

There are more than 550,000 abandoned hardrock mines in the nation. A single open pit mine has the capacity to hold 72 billion

computers, Small said.

Instead of viewing obsolete computer monitors and televisions as defunct sources of cathode ray tubes, "We should look at it as a commodity," Small said.

Mining is the "best, most efficient way to process materials with low value content (like e-waste)," Small said. "There's essentially no cost in this."

Electronic waste isn't that big in terms of quantity or volume. In fact, mining produces approximately 300 times more waste than electronics does every year, Small said.

E-waste is often richer in rare metals than virgin materials, containing 10 to 50 times higher copper content than copper ore. A cell phone contains five to 10 times higher gold content than gold ore, Small said.

Small's solution could be an alternative to small-scale regional recycling programs that are employed today.

While some vendors have employed successful domestic computer take-back programs, other manufacturers [ship electronic junk overseas](#) to China, India and Pakistan.

By using mining techniques, "there's no need to ship e-waste overseas," Small said. "You can process it right here."

E-waste mining can take place anywhere. The process could be done on a large concrete pad, rather than an old pit mine.

Small says e-waste mining is both economically and environmentally sustainable. The method could be used only in mines that are void of groundwater problems.

"It would be foolish to process in an area that could cause a contamination problem," Small said.

But the cost of collecting and transporting material limits the sheer volume of e-waste that is ready to be processed.

"The big issue is we don't have enough material now," Small said. "As soon as we get more material, this could be done."

Only a system that allows for mass production will be able to address the proliferation of new technologies that may soon become obsolete, Small said. "We need a system to handle the 20-30 million TVs that are produced a year," Small said.

Small's idea could mark a dramatic shift from the traditional method of disassembling electronics.

"It's definitely out-of-the-box thinking," said Steve Changaris, northeast region manager for the [National Solid Wastes Management Association](#).

Still, it could take 5 to 10 years to accumulate enough materials to be mined.

If a huge volume of e-waste material can be aggregated to reach a critical mass and mining can be implemented cost-effectively, then Small's proposal could succeed.

"Some state or some jurisdiction is going to try this," Changaris said. "I believe there's a distinct possibility that this could work."

But while Small's idea could be less costly than traditional electronics recycling, critics say that it could add to the mining industry's devastating impact on the environment.

"I don't believe that the environmental community would allow us to dump our electronics and add to the mining waste," said Robin Ingenthron, vice president of [ElectroniCycle Inc.](#)

Small's proposal "shines a light on how atrocious the standards for mining are," Ingenthron said.

Even improper recycling poses less of an environmental threat than mining raw materials to produce the rare metals found in electronics, Ingenthron said.

According to the Environmental Protection Agency's [2000 Toxics Release Inventory](#), the hardrock mining industry is the nation's largest toxic polluter. In 2000, the mining industry released 3.34 billion pounds -- or 47 percent -- of all toxics released by U.S. industry.

"Pound for pound, open pit mining is the most-subsidized, most-polluting, lowest-employment-generating business in the world," Ingenthron said.

Mining precious materials from the Earth requires 30 percent more energy than recycling them from old computers. Those economics have caused recycling practices to constantly improve as nations develop.

"Sure, we need to shut down a few lazy recyclers," Ingenthron said. "But even the worst recycling sites are superior to mining. Mining is much harder to remediate and make right. It's fairly easy to recycle correctly."

The [General Mining Law of 1872](#) established current mining standards. The law allows companies to mine publicly owned minerals for free and pay no more than \$5 an acre for mineral-rich lands. If that law is repealed, then mining for e-waste might be more costly.

"The only reason why (mining e-waste) sounds like a good idea is because of how cheap it is to meet the standards of the 1872 law," Ingenthron said.

"As long as the 1872 Mining Law gives the gold, copper, silver and lead away for free, we will have to charge a fee to recycle that material from used electronics. We should be able to recycle for free, on the value of the rare metals."

Although Small's idea would produce less waste than getting raw material out of hard rock, re-use in secondary material in glass and plastics would be lost, Ingenthron said.

"Of course recycling would be cheaper if we lowered our standards to those of the mining industry. You could drop monitors into open pits of arsenic and cyanide, and walk away from the residue after you got the copper and gold out. But it makes more sense to raise mining up to the standards of recycling."

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