

HAZARDOUS WASTE

Why all those thrown-out cellphones and appliances matter

[James Marshall](#), E&E News reporter Published: Tuesday, January 21, 2020

Dismantled printers dot an e-waste junkyard in rural Hong Kong. Katie Campbell/KCTS/EarthFix/Flickr

When Americans toss out their old cellphones and laptops, they contribute to the world's second-largest haul of electronic waste, or what recycling advocates call e-scrap.

E-waste affects everything from national security and hardrock mining to international trade and environmental justice.

In 2016, the United States generated about 6.9 million tons of it, trailing only China, according to the United Nations University, which [tracks](#) global e-waste. That's 43 pounds of electronics tossed out per person each year.

It all ends up somewhere.

Many old cellphones and televisions collect dust in desk drawers and garages. Other e-waste, which includes household appliances and electronic medical equipment, gets recovered by certified recyclers who carefully handle the toxic metals inside. But much of the e-waste the United States generates gets shipped to developing countries, where the public health and environmental costs can be disastrous.

Here are four things to know about e-waste:

What's the safest way to recycle it?

U.N. University says the United States collects 22% of e-waste for recycling, with the rest sent to landfills or ending up elsewhere.

Bob Akers, director of the sustainable e-waste recycling certification program e-Stewards, said consumers should bring their used electronics to certified collection centers, such as Staples locations. From there, an e-waste processor sorts and disassembles electronics to separate metals, glass, plastics and other materials that can be reused or recycled, while making sure all data left on the devices gets erased.

Workers at certified facilities are trained to safely handle the electronics, many of which contain hazardous materials such as mercury and lead. Smelters receive the circuit boards and microchips, which contain valuable metals including gold, copper, palladium and rare earths. They separate and melt them down so they can be sold and recycled.

But only a small fraction of global e-waste is recovered this way. Much of American e-waste — the amount is disputed — gets exported to foreign recycling factories with far laxer labor and environmental standards.

That sort of underground industry is "the real dirty secret in the recycling industry," said Bob Houghton, CEO of Sage Sustainable Electronics, an Ohio-based information technology asset management firm.

What are the risks of shipping it overseas?

Houghton, who has worked in e-waste recycling and reuse for 20 years, is skeptical of e-waste recycling because he doesn't trust that products will be recycled in an environmentally friendly way.

"The stuff is put into shipping containers and shipped overseas to low-wage countries. And the people that end up actually doing the 'recycling' are very often exposed to a lot of toxic materials. A lot of dangerous materials end up getting dumped into the environment," he said.

Guiyu, a city in southeast China, used to be the epicenter of e-waste recycling and importing. Mounds of phones, plastic computer shells and circuit boards littered the city. Workers, including children, would burn the plastic coating off steel and copper wires over open fires, according to a 2002 [study](#) by Basel Action Network, an environmental justice organization in Seattle.

But the e-waste export market shifted to other Southeast Asian countries after China limited imports of solid waste as part of a larger crackdown.

"A lot of the material that at one time was going to Guiyu is now going to Vietnam, Pakistan, Malaysia," Houghton said. "Look at the low-wage countries around the globe. There's probably ... an informal recycling industry accepting waste from developed countries."

Toxins from e-waste can leach into the soil, water and air near informal recycling sites. Researchers in India [found](#) surface and groundwater near an e-waste dump in Delhi had levels of copper eight times higher than its control site.

And near an informal recycling center in the West Bank, where burning e-waste to recover metals is common practice, doctors have [found a link](#) between childhood lymphoma and proximity to the facility.

The amount of e-waste the United States exports today is unclear.

In a 2016 [study](#), Basel Action Network, which started e-Stewards, attached 152 tracking devices to cathode-ray tube monitors, LCD monitors and printers headed to recyclers. These products are the recycled electronics most likely to be exported, the study says.

Forty percent of the trackers ended up overseas, mostly in developing countries.

The Institute of Scrap Recycling Industries Inc. (ISRI), a trade association with more than 1,100 members including Waste Management Inc., disputes that figure. It points to a [survey-based report](#) by the U.S. International Trade Commission that found e-waste exports accounted for just 7% of total sales of used electronics in 2011.

Can you make money from it?

Discarded electronics have immense value. A ton of cellphones has 100 times more gold than a ton of unprocessed gold ore, according to the [World Economic Forum](#).

"We don't call it e-waste, we call it e-scrap. Scrap is not waste," said Robin Wiener, president of ISRI. "It's a valuable product."

Extracting resources from e-waste, or urban mining, could become a more viable option as metal ore in the ground becomes scarcer.

Cellphone circuit boards can contain palladium, silver, copper and rare earths, vital elements used in a range of electronics on which China has a virtual monopoly ([E&E Daily](#), Sept. 26, 2019).

But recycling e-waste in the United States can be too expensive to be practical. Setting up a recycling plant with the proper equipment and worker safety measures can cost tens of millions of dollars, Houghton said. If a company only recycles high-value electronics like cellphones and computers, it may not turn a profit.

Is exporting e-waste a national security threat?

Some lawmakers in Congress seem to think so.

Sens. Sheldon Whitehouse (D-R.I.) and Lamar Alexander (R-Tenn.) are sponsoring [S. 2448](#), the "Secure E-Waste Export and Recycling Act (SEERA)," in an effort to keep data and used microchips from becoming foreign assets.

"We need to do a better job of keeping that electronic waste out of the hands of foreign counterfeiters who are working to sneak fake products into our military supply chain," Whitehouse said in a news release.

If microchips in used electronics aren't shredded, unscrupulous recyclers can relabel them and sell them off as new. Data remaining on those chips can also be sold, posing a privacy threat, Akers of e-Stewards said.

He ran an electronics recycling facility in Kansas City, Mo., before joining e-Stewards. "When I was running the facility, we found data on hard drives from banks, news stations, law enforcement and a medical facility," Akers said.

"SEERA" would require untested electronics to be recycled domestically. It would allow low-risk electronics to be sent abroad to legitimate recycling facilities as long as exporters provide product descriptions and names of receiving countries to the Commerce Department's Bureau of Industry and Security.

ISRI, one of the most powerful recycling lobbying groups in Washington, is staunchly pro-free trade and against the bill.

The group's chief lobbyist, Billy Johnson, said counterfeiting is a serious problem but counterfeiters will still get their hands on new and used chips even if the United States curbs e-waste exports.

"Electronic devices are ubiquitous throughout the world, so limiting a small amount of used electronics from the United States is like a cup of sand on a large beach," Johnson wrote in an email.

Johnson prefers monitoring what goes into the supply chain as opposed to controlling "the universe of used chips."

"SEERA has been shopped around for nearly a decade, first as an environmental bill, then a workforce development bill, then a national security bill," Johnson said, suggesting the bill won't work on any of those fronts. "SEERA is an old solution looking for a new problem to solve."

The bill is awaiting action in the House Foreign Affairs Committee and the Senate Banking, Housing and Urban Affairs Committee.