

**PERSONAL TECH**

# Recycling Electronic Waste Responsibly: Excuses Dwindle

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MACHINE LEARNING

MAYBE you replaced old electronics over the holidays or you're just sweeping out the old and ushering in the New Year. Either way, you'll need to do something with your old devices. For everyone's sake, including Mother Nature's, try to get rid of your old technology the right way.

Recycling electronics is becoming easier by the day. Stores like Best Buy and Staples now offer programs to take back old gadgets and recycle them. Churches and schools commonly hold e-waste collection drives, and you can even occasionally find bins for dropping off old tech on the street.

Still, most old gadgets end up in the trash. Americans alone throw away two million to three million tons of electronics yearly, according to the Environmental Protection Agency. With the life span of devices shrinking — the average phone is replaced every 18 months — the problem keeps growing worse.

The toxic waste from all those tossed gadgets causes terrible damage to soil, water and people. The Blacksmith Institute, a nonprofit organization that focuses on solving global pollution problems, estimates that so-called toxic e-waste threatens the health of 100 million people worldwide. And the United Nations Environment Program calls electronic waste the "fastest growing waste stream in the world."

The solution is not just recycling. It's to be sure that you're recycling with a responsible processor. Some programs do little more than pass the load to unverified operators that then toss loads of e-waste into increasingly toxic dumps around the world.

"If you don't know where the material goes, you could be thinking you're doing the right thing, but it ends up being put on a ship" and contributing to global dumping, said James Kao, the chief executive of GreenCitizen, an electronics recycling company in California.

GreenCitizen is certified by the two independent standards bodies that monitor recyclers for responsible practices: eStewards and Sustainable Electronics Recycling International, whose certification program is called the R2 standard.

eStewards and S.E.R.I. use a network of auditors to make sure companies like GreenCitizen are doing what they say they're doing.

Mr. Kao said the ultimate goal of GreenCitizen, for example, was to dispose of as little as possible. It will reuse or sell anything that still works.

The company operates drop-off facilities around the Bay Area where consumers can deposit used electronics, and it also picks up from businesses in the area.

Technicians at its facility in Burlingame, Calif., fix minor technical problems, clean up old devices, photograph them and list them on GreenCitizen's eBay site. Mr. Kao said 30 percent of the electronics it collects were resold in some fashion, which helps pay for the operation.

If an item can't be resold, it may be stripped for parts, which will be either sold separately or used to fix broken items like the screens of laptops or phones. And finally, anything that can't be reclaimed will be sent to a responsible third-party vendor to be broken down or destroyed.

Organizations around the world have been certified by S.E.R.I. and eStewards. Both groups let you search their websites for local options. In New York, for example, you can take electronics to GreenChip Electronic Waste Solutions, an R2-certified recycler, or have them picked up by 4th Bin, which is certified by eStewards and also has R2 certification.

Some large companies, like Best Buy and Dell, have committed to better practices as part of a program started by the Environmental Protection Agency.

The standards for the E.P.A. program, however, aren't as rigorous as those for eStewards and S.E.R.I. Companies that join the E.P.A.'s Electronics Challenge program pledge to collect more electronics for recycling, send them to certified recyclers and to publicly report their efforts.

There are three tiers of commitment in the E.P.A. program. Companies at the lowest tier don't have to prove they're doing much other than creating a collection program and sending a small percentage of electronics to responsible recyclers. But Best Buy and Dell, as well as some other big companies, participate at the highest level.

So it is worth doing a little work to look up a trustworthy source. Patty Osterberg, director of education and outreach at S.E.R.I., said she estimated that only about 25 percent of recyclers in the United States were certified by one of the two standards organizations.

Ms. Osterberg said the process of getting certified from S.E.R.I. was "arduous," and Mr. Kao said eStewards certification was even tougher. So a Best Buy drop-off might be more convenient than finding a certified recycler in some parts of the country.

Ms. Osterberg said that since the recycling industry first began moving toward more responsible practices about 10 years ago, the mission had changed from purely recycling to a greater emphasis on intercepting usable tech.

"It used to be that people saw horrible images of kids playing on mountains of old computers and monitors, and that sparked this whole movement for responsible recycling," she said. "If you recycle for raw materials, you get a portion of that product. But if you can reuse a cellphone, that's the most environmentally beneficial of all."

The R2 certification standard, she said, puts extra emphasis on the "reuse hierarchy." Recyclers that collect e-waste have to show that they've tried hard to reuse products that come in — not just stripping them down and selling off

individual parts, but trying to resell an entire phone, computer, printer or game console.

The second level in the hierarchy is to find parts and components that can be reused in other products. Touch screens can be sold to toy makers, for example, or circuit boards can be used in other computerized devices.

And if the entire item can't be sold, recovering heavy metals like gold, palladium and other raw materials inside electronics is a form of "urban mining," Ms. Osterberg said.

"Once you've recovered all the value, there certainly is a place for recycling for raw materials, but that's the third step in the chain," she said.

Of course, if you're willing to put in a little extra work, you can cut out the middleman in the reuse hierarchy completely. Websites like **Gazelle** and **BuyBackWorld** will purchase your old devices for a flat rate, depending on condition, and Amazon lets you trade in old gadgets for gift cards. And of course, there's always **eBay**.

Or consider whether you really need to upgrade that phone, tablet or laptop at all. If it works well enough to sell to someone else, do you really need a new one?

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