Obsolete gadgetry can pile up, contributing to pollution

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Christmas gifts of yesteryear meet an inglorious end at Absolute Green Electronics Recycling in Lake Forest, Calif. Computers are dismantled, the parts sorted into cardboard bins. One holds nothing but hard drives, another AC adapters. Bins stretch in rows across a mammoth warehouse - a bin for graphic cards, a bin for cooling fans, also cellphones, VHS camcorders, digital cameras, cables, network switches.

Stacked-up printers form a miniature mountain. Old-fashioned picture tubes sit face-down on pallets. Flat-screen monitors cluster along a wall like tombstones.

"There are different grades of boards," said owner and President Victor Kianipay, stepping past hulking, dust-covered projection TVs to poke into apple boxes filled with circuit boards. Some are etched mainly in copper; others are heavily embedded with silicon chips. "Everything gets separated," Kianipay said. "There are so many layers and layers of product."

This is electronic waste, or e-waste - a revenue stream for Kianipay, who moved 25,000 pounds of discarded items in last January's post-Christmas frenzy. E-waste also, despite the work of Kianipay and other entrepreneurial recyclers, is an environmental problem of global proportion. The ever-rising tide of electronic junk now totals nearly 50 million tons a year worldwide, according to the Solving the E-Waste Problem Initiative, a coalition of governments, scientists and industry groups based in Bonn, Germany.

Within five years, the annual figure may reach 65 million tons - enough to fill trucks parked bumper to bumper encircling three-quarters of the Earth, the coalition estimates. The waste is a particular concern in part because much of it contains lead, mercury and other hazardous substances, which are released when the waste is melted down to recover gold, silver and copper.

The widespread practice, by some recyclers and waste dealers, of exporting electronic waste to developing countries has created bustling scrap economies in poor parts of China and Africa while exposing large numbers of people to toxins and carcinogens.

"You see all these thousands - literally thousands - of women and young kids whose job is to cook circuit boards," said Jim Puckett, founder and executive director of the Seattle-based Basel Action Network. The group is named after the Swiss city where international agreements were drafted in the late 1980s and early 1990s to stop the "digital dumping."

Although 35 nations have adopted the tenets of the Basel Convention, Puckett said, the United States - by far the largest producer of e-waste - has not.

The U.S. Environmental Protection Agency, in a report posted on its website, said "most discarded consumer electronics end up in our landfills" - a wholly separate environmental problem. No one is sure how much e-waste ends up being exported from the U.S., the EPA says, but "the United States government is concerned that these exports are being mismanaged abroad, causing serious public health and environmental hazards."

Puckett, who has spent years investigating the issue, estimates that "about 50 to 80 percent of what is handed over to recyclers is exported."

Spurred by environmental activists, Congress and state governments are trying to ensure that e-waste gets properly recycled here. The federal Responsible Electronics Recycling Act, introduced in July and co-sponsored by Rep. Mike Thompson, D-Calif., would prohibit the export of toxics-containing electronic junk to nations that cannot process them safely.

The bill has gained bipartisan support and now sits in the House Committee on Energy and Commerce, said Austin Vevurka, Thompson's press aide. "It addresses a growing environmental and health problem and it helps create good-paying recycling jobs in the U.S.," Vevurka said. "It's a win-win."

In addition, President Barack Obama established the Interagency Task Force on Electronics Stewardship in 2010 to encourage development of "greener" electronic devices and to boost domestic recycling.

California became a national pioneer by enacting the Electronic Waste Recycling Act of 2003, which created a system of incentives to prevent the disposal of most video-display devices and certain other types of electronic equipment in landfills. The law applies to laptops and televisions that use liquid-crystal display or plasma screens and especially targets outmoded TVs and computer monitors that have cathode-ray tubes.

The old TVs are particularly bad because they contain both lead and mercury, said Mark Oldfield, a spokesman for the state's Department of Resources Recycling and Recovery.

Since 2005, when the state began keeping track of e-waste recycling statistics, more than 1.5 billion pounds of video-display equipment has been collected directly because of the law, Oldfield said .

The haul has risen from 65 million pounds the first year to more than 200 million pounds in 2012 - and it's thought that a similar volume of other devices, including printers and fax machines, has been recycled as well, Oldfield said.

Consumers who buy a new monitor or a flat-screen TV pay a recycling fee that helps fund an incentive program to encourage recycling, explained Jeff Hunts, manager of Cal Recycle's E-Waste program. The money is paid to authorized collectors and recyclers who dismantle and properly dispose of the unwanted equipment rather than export it or throw it in the dump, Oldfield said.

The system has caused a proliferation of private facilities that accept e-waste. About 600 collectors now operate in California, Oldfield said. E-waste also is accepted at some county-run hazardous-waste disposal sites.

Kianipay, who opened his Lake Forest recycling firm in 2011, said he is proud that nothing he accepts ends up in landfills or developing nations, even though he complains about the amount of paperwork required by the state to document the flow of waste. Much of what he receives is dismantled in his own warehouse, he said. CRTs, circuit boards and other jetsam that cannot be processed there are sent to other approved facilities in California for shredding, he said.

"We receive almost 200 different types of electronics," Kianipay said. "There's no limit to the models and types."

Inside a long, cluttered warehouse at EZPC Recycle in Santa Ana, Calif., owner Chris Chun has a workbench where his staff tests discarded computers and network switches. Devices that still work are sold on the secondhand market. Computers are offered at a steep discount to schools and churches.

"I have kids. I want them to have a clean, safe environment," said Chun, a father of two boys. If electronic equipment gets tossed into a dump, "it just stays there," Chun said. "It's never going to decompose."

Still, e-waste is never particularly easy or clean even when handled properly. Taking apart some equipment requires removing up to 50 screws, Chun said.

Industrial-scale shredders turn circuit boards and hard drives into voluminous bits of glass, metal and plastics, which require further processing in a smelter to isolate the gold, silver, copper and palladium, said Ted Smith, founder of the San Francisco-based Electronics TakeBack Coalition.

"There are no smelters that do this in the U.S.," due to the environmental effects of the smelting process, Smith said. Therefore, the shredding companies "send the metals by rail car all the way to northern Quebec, where there is a smelter."

While regulators herald the success of California's recycling law, they remain unsure how much is properly recycled in comparison to how much is thrown away or exported. Oldfield, the Cal Recycle spokesman, said he believes the percentage recycled in California is well above one-third, but he added, "We have no way of knowing that."

So far, nearly half the states have passed laws, but environmentalists fear they are only losing ground because of the astonishing explosion of devices.

Consumers upgrade their cellphones even when the old ones still function. Whole classes of gadgetry have come into being, such as GPS systems and Google Glass.

"Four hundred million gadgets a year get thrown away in this country," said Annie Leonard, founder and president of The Story of Stuff Project in Berkeley, Calif. Nationally, she said, less than one-fourth gets recycled. "The way we make, use and throw away products in this country is a cause for national embarrassment."

The electronics industry is "all about turning out the next generation of products and getting consumers to discard the old ones," said Smith, of the Electronics TakeBack Coalition. "It's not that the old ones don't work; they don't have the bells and whistles that new ones do."

E-waste is seen as the fastest-growing part of the trash stream. "We've made significant progress," Smith said. "But the extent of the problem continues to grow and has far outgrown our ability to solve it."

Smith's coalition hopes to shift more responsibility onto manufacturers to take back and recycle the products they sell. Laws in many states already are accomplishing that, he said. The tougher stance sends a signal to the industry to design devices that are less toxic and easier to repair or take apart and recycle, Smith said.

Electronics manufacturers acknowledge that e-waste is a huge problem but say they get a bad rap from environmentalists who accuse them of creating planned obsolescence, said Rick Goss of the Information Technology Industry Council, a Washington, D.C.-based group that represents more than 50 major firms.

"We hear that red herring all the time," he said. Compared with other industries, the electronics sector has been notably progressive, he said. "Our companies actually compete against each other in the marketplace based on sustainability, recycling programs and energy efficiency."

Still, Goss said, creating viable technology is not as easy as making

coffee tables or bowling balls. Manufacturers also compete based on "faster speeds, better user interfaces, better graphics, enhanced connectivity, better private settings and more secure communications," Goss said. "Our industry lives and dies on innovation. The pace of innovation is breathtaking."

Tech companies recognize they need to cooperate with government agencies to deal with products that become outdated, but they shouldn't have to carry the burden alone, Goss said. Retailers and others in the supply chain should share those costs, he said.

"We're the first ones to stand up and raise our hands and say, 'We have a role in the process,' " Goss said. "We all need to work together to provide a mechanism for consumers to turn used products back into the system."