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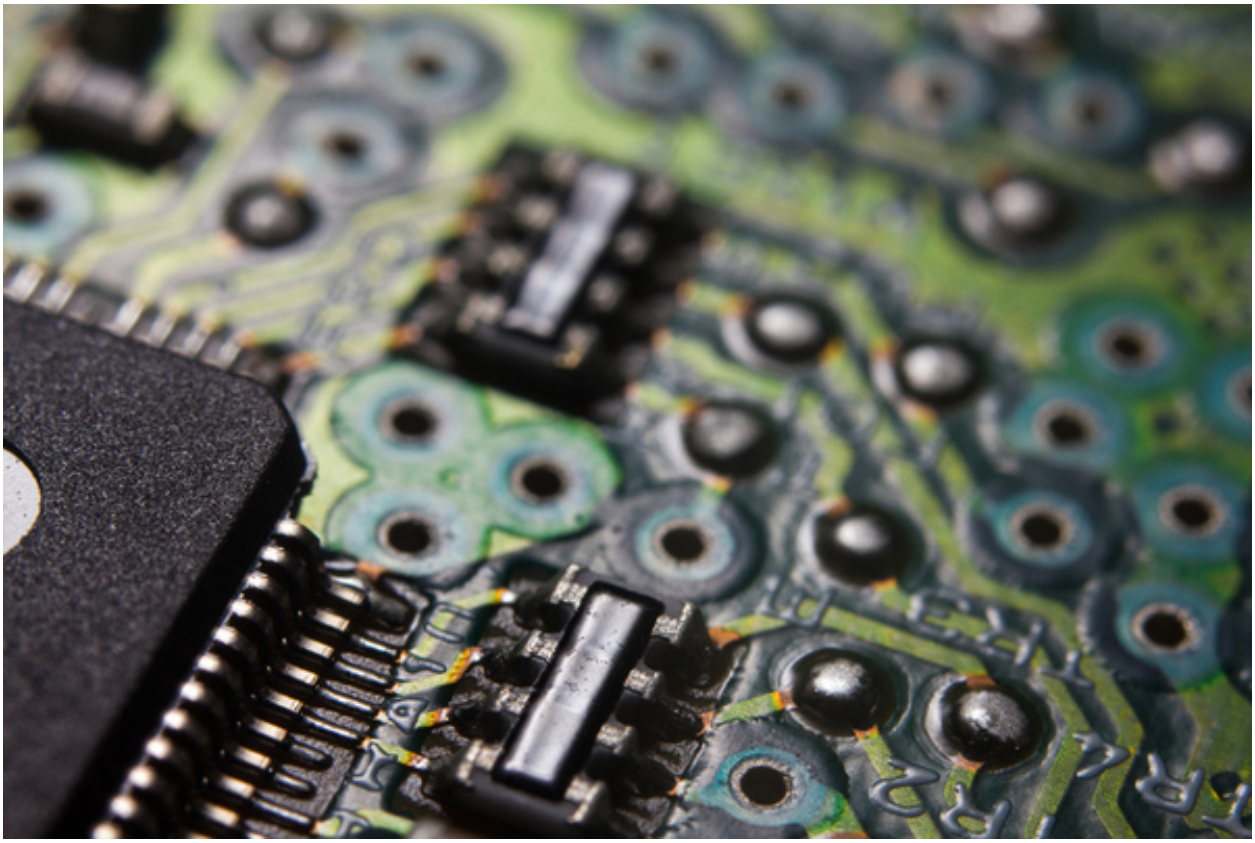
Why E-Waste Compromises American Military Technology

By Andrew Dobbs



While many hawkish lawmakers may not want to hear it, the military brass is getting serious about environmental threats to national security. Climate change is a clear threat to global security, but so are less obvious threats from a source where you might not expect it.

Recycling electronic waste—or "e-waste," the discarded gizmos, gadgets and machinery we use in our contemporary lives—is an issue near and dear to the hearts of environmentalists and eggheads alike. But it's also a growing concern to military officers and some of America's crustiest politicians—hardly the tree-hugging types.

Our recycling policies not only fuel conflict in the developing world, but they help endanger sensitive military technology—while harming the health of American troops and locals abroad.

Safer and saner waste and recycling policies at home and overseas, in the military and among civilians can make for a more peaceful world.

Despite the fact that much of what constitutes e-waste has a great deal of value if properly recovered, the United States ships a large proportion of it—perhaps as much as 80 percent—to developing countries where it's dumped on populations for "processing" in crude, informal scrap operations.

Much of this material is shipped to West Africa. At one e-waste operation in Ghana, salvage crews use open fires to burn plastic off copper wires and loosen components from circuit boards. These toxic chemicals end up in the environment.

This humanitarian threat, however, is not what specifically worries American military experts. A bigger threat in their estimation is the fact that China is another major recipient of export-dumped e-waste.

Military Technology Damaged

Chinese export dumping not only poses these same health threats, it drives a thriving industry in counterfeit electronics components. This problem recently received a write-up in National Defense, which noted the problem of these parts filtering back into the U.S. military's supply chain.

"E-waste is shipped by boat across the Pacific Ocean, smuggled into China and trucked to Guangdong Province, the epicenter of counterfeiting activities," the magazine reported. "There, workers pull apart the e-waste by hand, often in backyards and dump sites."

"After drying in the open air, the parts are shipped to larger facilities that are set up for counterfeiting. The parts may be sanded or put through an acid wash to remove part numbers, then re-coated in a process known as 'blacktopping' to hide identifying product information."

Clearly, tampering with these components can damage them—although it might not be immediately obvious.

Counterfeiters later sell these shoddy parts "to U.S. companies that are unaware of their origins and incorporate the counterfeit parts into their products," National Defense added.

The article referenced a report delivered in 2012 to the Senate Armed Services Committee about counterfeit electronics parts in the defense supply chain. The report is shocking, with a variety of examples of counterfeit electronics causing significant problems in crucial military technologies.

These include several issues in Navy and Air Force aircraft including avionics systems in the C-27J Spartan transport plane, display systems in that aircraft and the C-130J transport.

In addition, counterfeit parts compromised ice detectors, distance-measuring equipment and other systems in the Navy's P-8A Poseidon—among "dozens" of other examples.

Perhaps the most chilling example is when a flash memory device used in the mission computers for the Terminal High Altitude Area Defense missiles, part of the Ballistic Missile Defense System, failed due to a counterfeit part.

The most direct solution for this problem—one supported by the military contractors writing in National Defense and the Electronics Takeback Coalition alike—would be to outlaw export dumping of e-waste altogether.

In the meantime, consumers and others can choose to recycle their e-waste with certified recyclers who use a credentialing system to ensure that they are not export dumping.

But even this is not a sure thing. Of the two major certification programs—E-Stewards and Responsible Recycling or "R2"—the R2 program is far more widespread, easier to obtain and full of loopholes which allow many of the materials "recycled" through it to end up overseas anyways.

Until legislation can fix this, well-meaning Americans will send their products to be recycled, only to have them dumped on vulnerable populations overseas and turned into shoddy parts for vital military technology.

Foreign Wars Worsened

Beyond U.S. security, e-waste recycling could potentially relieve some of the world's most distressing conflicts.

A series of civil wars has beset the Democratic Republic of Congo for nearly two decades—with a dizzying array of warring parties, including fugitive rebels from other nations taking advantage of the country's lawlessness. Perhaps as many as 5.4 million people have died in the conflict, half of them children under five.

These warring groups have found that the country's rich supply of minerals necessary for the production of electronic devices—coltan in particular —provides a steady stream of funding.

Coltan is an ore used to make the tantalum in the capacitors in electronic devices, including mobile phones and game controllers. The vibration function in these devices often use tungsten, much of which is refined from wolframite, another conflict mineral found primarily in the Congo.

Wasting devices by throwing them into the trash or dumping them abroad makes it harder to develop sources of coltan and wolframite outside of the channels feeding the conflict in Central Africa.

Indeed, elements of the Dodd-Frank Act—known for reforming securities trading and banking—drive manufacturers towards scrap and recycled sources of these materials, in order to prevent American consumer dollars from going to Central African conflicts.

The best way to ensure that electronics get recycled is extended producer responsibility laws, which require manufacturers to ultimately take responsibility for the disposition of their products. Most states have these

laws now for at least some electronics, but a majority of e-waste still ends up in domestic landfills and incinerators where they wreak havoc on air, water and land.

The best states have disposal bans on e-waste and educate their public about the fact that it's illegal to trash their electronics. States with such laws see about 72 percent higher recycling rates than states without them.

This means millions of pounds of e-waste recycled, which means millions of devices powered by recycled minerals instead of fueling the world's wars.

Service Members' Health at Risk

Until at least 2009, U.S. military installations in Iraq and Afghanistan disposed of their waste—including munitions, electronics and a variety of other hazardous materials—in open-air burn pits.

Industrial "mass burn" municipal waste incinerators are major sources of air pollution and deeply controversial at home, but these burn pits were worse. Lacking even the inadequate pollution controls formal incinerators use, soldiers in these countries simply piled up waste and set them on fire.

"Waste burning is one of the worst things you can do for the environment, and it causes tremendous damage to human health," said Monica Wilson, program director for the Global Alliance for Incineration Alternatives.

"Incineration kills people, and exposing war-impacted populations and soldiers to this pollution is a terrible injustice," she added. "Not only will the veterans be harmed by this, but so might their eventual children—waste incineration releases powerful toxins which cause birth defects even years after exposure."

Among the most serious problems is that burning most plastics—which contain chlorine—produces dioxins. These tiny polluting particles are responsible for hormonal disruptions, cancers and birth defects.

One of the most notable dioxin compounds is 2,3,7,8-Tetrachlorodibenzodioxin, the dioxin which contaminated Agent Orange and led to tremendous suffering for thousands of U.S. veterans and Vietnamese civilians during the Vietnam War.

Soldiers are expressing concerns about their exposure, just like those returning from Vietnam did a generation ago.

Waste incineration is anathema to environmentalists because it destroys recyclable items, thus wasting valuable resources. While the difference between buying new stuff and reusing or recycling material for longer periods might not make a huge difference in trillion-dollar defense budgets, those small differences can have major impacts over time.

Additionally, the military is a big enough consumer that it can help bolster recycling markets at large.

A greener military can mitigate the strategic threats posed by terrible waste practices. And there's a moral issue—burning waste poisons both American troops and locals in host countries.

"The burn pits set up a toxic 'out of sight, out of mind' approach which makes wastefulness cheap, and hurts resource conservation through recycling and composting," Wilson said. "This leads to a more toxic, less efficient military overall."

The open burning of waste is probably over now, but the military has ignored past directives on this front before. The alternative—more sophisticated incinerators—is not a real solution to the health, environmental and strategic threat posed by waste burning.

Forcing the military to find another solution could, like disposal bans in civilian policy, lead to redesigns for greater sustainability and more conservative, less wasteful procurement.

Waste and recycling sometimes get the short end of the environmental stick, especially when it comes to hot issues for politicians or celebrities to go on about. For that very reason, however, it lacks the divisiveness that other environmental causes are plagued with.

Nobody likes trash, most people are OK with recycling, and businesses love getting the most bang for their buck by keeping valuable materials out of the dump. Smart waste policy is a strategic imperative for defense policy makers facing the threat of counterfeit electronics or toxic incineration pollution, and it can mean reducing conflict in the world's most war-torn countries.

It's about keeping our security out of the dustbin of history—literally.

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