

## The Surprisingly Lucrative Business of Recycled E-Waste

In Nigeria and elsewhere, entrepreneurs are making money by dismantling electronics—and sending valuable metals back to the developed world.



E-waste at a scrapyard in Lagos. *Photographer: Irene Galan/UNEP*

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In Lagos, Nigeria, Tijjani Abubakar runs a surprising, and lucrative, business: He sells trash from one of the world's poorest countries to some of its wealthiest.

Abubakar's warren of workspaces, in a dingy concrete building near a sprawling electronics market, is a charnel house of dead cellphones. Workers armed with screwdrivers and hammers remove mobiles from plastic sacks and crack them open like walnuts. Their practiced fingers pull out the printed green circuit boards inside, then toss them into heaps at their feet.



Abubakar's warehouse in Lagos. *Photographer: Vince Beiser*

The circuit boards hold minute amounts of copper, nickel, gold and other valuable metals. Retrieving those metals, though, is much more difficult than simply breaking open a phone. Shredding the boards and separating out their elements requires sophisticated, expensive equipment. Not a single

facility anywhere in Africa is capable of performing this feat. So Abubakar exports his circuit boards to better-equipped foreign recyclers. Almost all of them are in Europe or China—sometimes in the very countries where the devices were manufactured.

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The problem of rich countries dumping electronic waste in poor ones has been well-documented. What's far less reported is that there's a growing flood of digital detritus moving in the opposite direction, driven by entrepreneurs across the Global South.

E-waste, as it's commonly known, is a broad category that comprises just about anything with a plug or a battery that's been thrown away. That includes the computers, phones, game controllers and other digital devices that all of us are using and tossing out in ever-increasing volumes. The world generates more than 68 million tons of e-waste every year, according to the United Nations, enough to fill a convoy of trucks stretching around the equator. The question of how to deal with it all is growing ever more urgent; it's a uniquely troublesome form of trash. If you just dump those gizmos in a landfill, they can leach toxic chemicals into the soil and water. And their lithium-ion batteries can catch fire, setting dump sites ablaze. Nonetheless, the UN estimates that only 22% of all e-waste worldwide is collected and recycled. The rest gets discarded, burned or just forgotten about at home or work.

On top of the environmental damage, this is a colossal waste of resources. Digital gadgets contain many valuable metals, such as the copper in their circuit boards and cables and the lithium, cobalt and nickel in their

batteries. The world is currently trashing more than \$60 billion worth of metals in e-waste every year, according to the UN.

In rich countries, most people have no easy way to recycle their old iPhones or Xbox controllers, so they end up tossed out or gathering dust in junk drawers. In the US and Europe, fewer than 1 in 6 dead mobile phones is recycled.

Things are different in the developing world. If you're living on \$2 a day, making 10 cents from a discarded electric toothbrush is well worth your time.

According to the UN, less than 1% of the 3 million tons of e-waste that Africa generates each year is recycled by licensed, formal businesses. The real recycling rate is far higher. Nigeria, like many developing countries, is home to a startlingly efficient network of tens of thousands of unlicensed, untaxed scavengers and waste pickers who collect broken phones, laptops, Wi-Fi routers and other digital debris and then sell them to local brokers such as Abubakar. An estimated 75% of Nigeria's e-waste ends up collected for some kind of recycling. In India, the number is estimated to be as high as 95%.

Abubakar buys and sells all manner of e-waste, but he specializes in cellphones. The supply is abundant. All over the developing world, phones have become as common as T-shirts. There's just shy of one registered mobile account for every one of Nigeria's 210 million people. Those phones, like all such devices, eventually wear out or get tossed by owners eager for a newer model. Worldwide, more than 5 billion mobile phones are thrown out each year.



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No one knows exactly how much e-waste is flowing from poor countries to rich ones, but it's clearly a growing trade. Buyers from Chinese companies, as well as European ones like Belgian recycling giant Umicore, are actively scouring the scrap markets of Africa, Asia and Latin America in search of recyclable materials to ship to their home countries. Abubakar says his business works with hundreds of people and has made him wealthy enough to donate schoolbooks and cattle to families in his impoverished home province.



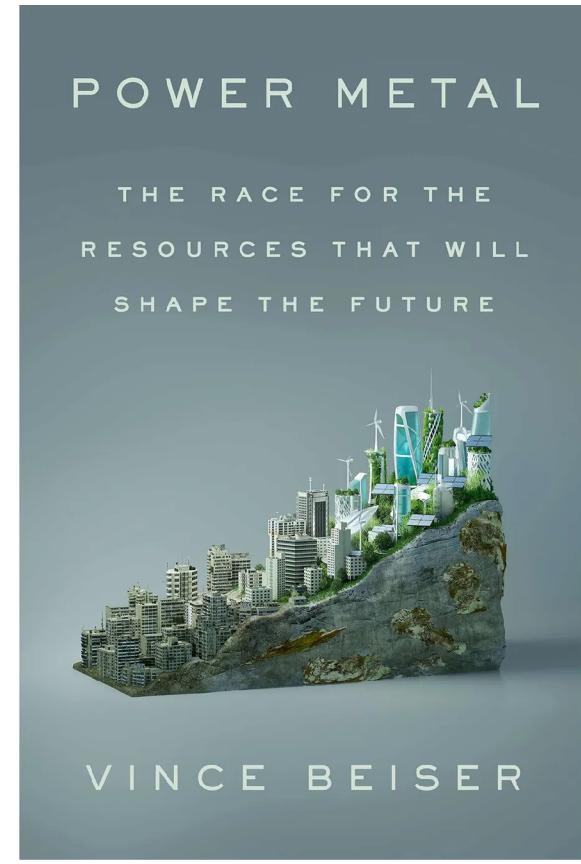
Copper extracted from a fridge cathode. *Photographer: Irene Galan/UNEP*

The e-waste industry offers other benefits. Companies like Abubakar's are diverting trash from landfills, reducing the need for mining fresh metals and creating thousands of desperately needed jobs. Unfortunately, that's not the whole story. While circuit boards get recycled, other parts of digital devices are often trashed using crude, polluting methods. Power cords and cables are burned in toxin-belching open fires. Lithium batteries are tossed in dumps, where, in addition to starting fires, they can leak dangerous chemicals. The laborers doing the burning and dumping typically earn only a few dollars a day and work without safety gear amid caustic chemicals and toxic fumes.

The damage from these kinds of operations is well-documented. In Nigeria, dangerous levels of heavy metals and other toxins have been found in the soil of e-waste dismantling sites. Studies of Guiyu, home to China's biggest e-waste recycling complex, have found extremely high concentrations of lead in the blood of children living nearby. A 2019 study by an environmental organization in India found more than a dozen unlicensed e-waste recycling "hot spots" around Delhi employing some 50,000 people. In those areas, unprotected workers were exposed to chemical vapors, metallic dusts and acidic effluents.

There are ways to increase the benefits of this kind of e-waste recycling while limiting the damage. Today, most scavengers operate in the untaxed, unregulated "informal" economy and would profit from being brought out of the shadows. Boosting their skills, capacity and pay while also regulating the environmental impacts of their work would prove beneficial to everyone. In some developing countries, scrappers and waste pickers have organized into unions and won government support for their work.

Essentially, these workers have been recognized as entrepreneurs performing a valuable service. In dozens of cities in Colombia, for instance, the government pays waste pickers a slice of municipal trash fees to supplement the money they make selling recyclable materials. In Pune, India, thousands of door-to-door waste pickers who belong to a worker-owned cooperative are paid small fees by the households they service—including in slums that regular city services ignore. They handle more than 1,000 tons of waste every day. The future of e-waste might be recognizing the treasure embedded in all the trash.



Source: Penguin Random House

*Adapted from Power Metal: The Race for the Resources That Will Shape the Future , out on Nov. 19. Copyright © by Vince Beiser. Excerpted with permission by Riverhead, a division of Penguin Random House.*

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