Adding Value to Scrap?

Recycling consumer electronics just isn't profitable—yet

In the first weekend the iPhone was available, 500,000 units were sold. Most buyers already had phones—so what happens to them? A few get recycled, but most end up in the proverbial societal junk drawer, the local landfill. In fact, Americans scrap an estimated 400 million units of consumer electronics annually.

Although e-waste can be recycled, less than 15 percent of electronics scrap is, compared to 95 percent of automobiles. Why? What separates a junked car from a discarded cell phone is intrinsic value. If you leave your car in a burning heap by the roadside, someone will take it—because $200 worth of metal (primarily steel) is in that heap. This $200 value is driven by the automakers' desire to reuse the material, and is enabled by the materials' characteristics and the technology for recycling them. In sum, recycling becomes a viable business when end-of-life (EOL) products can be processed and someone is willing to pay more for it than the cost of recycling.

By Deishin Lee

The recycling supply chain starts with (raw material) collection from consumers—notoriously fickle suppliers. Here, automobiles have a clear advantage. Most people will pay to have an eyesore towed from their driveway; this is hardly the case for used electronics. But even if all EOL electronic products were collected, what is their intrinsic value? These devices contain trace amounts of gold, silver, palladium, and copper—valuable and reusable materials. A process similar to metal refining can recover them. The question is, how much value can be recaptured compared to the labor and capital required to collect, dismantle, and process the scrap?

Subtracting input costs from output value for the automobile recycler creates a positive balance—hence the thriving automobile recycling industry. The same calculation for electronics recycling is murkier, not least because the precious metals that make the products worth recycling are exactly those that manufacturers strive to design out to reduce cost. Demand for more features, and lighter, smaller form factors also drives manufacturers to use a wider variety of materials, thereby exacerbating recycling difficulties and cost. In fact, consumer demand and recycling requirements pull product characteristics in opposite directions. On top of that, electronics are being viewed more and more as a fashion item. Their value is determined by how "cool" they are, which marches to the brisk clockspeed of the fashion industry (approximately 18 months for a cell phone), thereby generating even more scrap.

Reently, there has been a move to make electronics manufacturers responsible for recycling their own products. While reasonable in concept, it's a mess in practice. Recycling involves scale economies. For example, recycling all cell phones in one operation is much more efficient than separately recycling each brand. To do so, however, means that manufacturers would have to work together, raising a host of issues. Should manufacturers who develop products for ease of disassembly pay less for the recycling effort? How would the precious metals be allocated among the manufacturers once they are recovered? The answers to these questions impact the manufacturer's cost and would be reflected in the retail price of the product.

Unless we want to end up in the quagmire of recycling regulations and auditing, the problem ultimately requires that we make it profitable for each player in the supply chain to be in business. Is there a way to increase the intrinsic value of EOL electronic products? The European WEEE directive regulates what should stay out of products (toxic materials). Why not regulate what goes into products? Would more gold-plated components in each device spur the innovation of would-be electronics recyclers? Sound crazy? Maybe not as crazy as 400 million units of electronics scrap piling up in your backyard every year. ■

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Deishin Lee is an assistant professor at Harvard Business School. Her research focuses on issues at the intersection of technology, operations, and the environment. dlee@hbs.edu.