

Pulling valuable metals from e-waste makes financial sense

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Electronic waste—including discarded televisions, computers and mobile phones—is one of the fastest-growing waste categories worldwide. For years, recyclers have gleaned usable parts, including metals, from this waste stream. That makes sense from a sustainability perspective, but it's been unclear whether it's reasonable from an economic viewpoint. Now researchers report in ACS' journal *Environmental Science & Technology* that recovering gold, copper and other metals from e-waste is cheaper than obtaining these metals from mines.

Projections indicate that about 50 million tons of e-[waste](#) will be discarded around the world in 2018, according to the United Nations' *Global E-waste Monitor* report. This type of waste contains a surprising amount of [metal](#). For example, a typical cathode-ray tube TV contains almost a pound of copper and more than half a pound of aluminum, though it only holds about 0.02 ounces of gold.

Xianlai Zeng, John A. Mathews and Jinhui Li obtained data from eight recycling companies in China to calculate the cost for extracting such metals from e-waste, a practice known as "urban mining." Expenses included the costs for waste collection, labor, energy, material and transportation, as well as [capital costs](#) for the recyclers' equipment and buildings. These expenses are offset by government subsidies and by revenue from selling recovered materials and components. The researchers conclude that with these offsets, it costs 13 times more to obtain these metals from ore than from urban mining.

The researchers also draw implications for the economic prospects of urban mining as an alternative to virgin mining of ores, based on the "circular economy," or recirculation of resources.

More information: "Urban Mining of E-Waste is Becoming More

Cost-Effective Than Virgin Mining" *Environmental Science & Technology* (2018). pubs.acs.org/doi/abs/10.1021/acs.est.7b04909

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