Economic assessment shows e-waste recycling is an industry worth billions

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People love their cell phones, tablets, and flat screen TVs, but far too many of those devices finally end up forgotten in a desk drawer or landfill. An economic assessment study published in *Renewable and Sustainable Energy Reviews* lays the groundwork to assist in decision-making around e-waste recycling programs designed to ensure that the valuable materials contained within electronic products will find a second life.

The paper by Lenny Koh of the Advanced Resource Efficiency Centre at The University of Sheffield in the U.K. and her co-authors has been selected for this month's Elsevier's Atlas Award.

"This paper is a cornerstone and crucial evidence base to really inform society globally and encourage us to think about the amount of embedded value and precious materials in the electronic products that we consume on a daily basis," Koh said.

Around the world, 30 to 50 million tons of electronic devices are tossed away every year. That volume of e-waste is expected to increase by three to five percent per year as consumers demand more and more "smart" products.

The European Union has made it a priority to work toward a circular economy, in which wastes are increasingly recognized as resources, and it's clear from the new work that such an effort makes good sense when it comes to economics. Koh and her co-authors estimate potential

revenues from recycled e-waste at more than two billion Euros in the year 2014. The value associated with those recycled resources is expected to rise by the year 2020 to more than 3.5 billion Euros.

Smartphones, tablets and other popular electronic products contain precious materials, including gold, copper, palladium, silver, platinum, cobalt, and more.

The researchers have developed a methodology to help organizations identify these key materials and to prioritize their investment in materials recovery based on factors including the amount of materials that are available in waste streams, their material composition, the price volatility of recovered materials, degree of purity required, and more. They've relied on their methodology to evaluate the potential revenues from the recovery of 14 popular e-products, including LCD and LED notebooks, TVs, computer monitors, cell phones and solar panels.

The recycling of electronic waste products also promises to reduce environmental pollution by conserving virgin resources, which are required for the manufacturing of high-tech consumer products as well as for aerospace, automotive and other industries. As the demand for these limited resources continues to rise, industry will be left with little choice but to capture recycled materials for manufacturing to meet the demand for their new products.

More information: Recycling of WEEEs: An economic assessment of present and future e-waste streams by Federica Cucchiella, Idiano D'Adamo, S.C. Lenny Koh, Paolo Rosa
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