Set world standards for electronics recycling, reuse to curb e-waste exports to developing countries

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Processes and policies governing the reuse and recycling of electronic products need to be standardized worldwide to stem and reverse the growing problem of illegal and harmful e-waste processing practices in developing countries, according to experts behind the world's first international e-waste academy.

Making appropriate recycling technologies available worldwide and standardizing government policy approaches to reuse and recycling could dramatically extend the life of many computers, mobile phones, TVs and similar products and allow for more complete end-of-life harvesting of the highly valuable metals and other components they contain.

"Rapid product innovations and replacements - the shift from analog to newer digital technologies and to flat-screen TVs and monitors, for example - is pushing every country to find more effective ways to cope with their e-waste," says Ruediger Kuehr of United Nations University, Executive Secretary of a global public-private initiative called Solving the E-Waste Problem (StEP). Based in Bonn, Germany, StEP works with policy makers, industry, academia and other stakeholders.

"Millions of old devices in North America and Europe could easily double their typical three or four year 'first life' by being put to use in classrooms and small business offices across Africa, South America and Asia," says Ramzy Kahhat, Center for Earth Systems Engineering and

Management at Arizona State University.

"An old Pentium II computer with an open-source operating system like Linux can run faster than some of the latest new models on store shelves."

"It's vitally important, however, to get unwanted devices into re-use before they get too old and damaged to be re-conditioned," says Dr. Kahhat, who advocates a return deposit to discourage consumers from simply storing old equipment in a drawer, garage or basement.

Dr. Kahmat and other international participants in the first E-Waste Summer School Sept. 6-11, organized by NVMP (the Dutch Foundation for the Disposal of Metal and Electrical Products) and StEP, shared and compared ideas on e-waste management.

Hosted at the Philips High Tech Campus in Eindhoven, Netherlands, participants from 15 countries explored topics ranging from policy, technology and economics to the social challenges of reducing e-waste - the first ever academy to look at the e-waste issue in its entirety, rather than through the lens of a specific academic discipline.

NVMP (the Dutch Foundation for the Disposal of Metal and Electrical Products) and Philips were principal partners in the effort, headed by United Nations University and EMPA, the Swiss Federal Institute for Material Science and Technology, and Germany's oldest technical university, Technische Universität Braunschweig.

Conclusions were presented Tuesday Sept. 15 at the R'09 Twin World Congress (www.r2009.org) in Davos, Switzerland.

Gold in the E-waste mountains

An exhaustive study Dr. Kahhat conducted in 2008 in Peru found that more than 85 % of used computers imported by that country were put back into service. That record contrasts sharply with the alarming statistic from Nigeria, Pakistan and Ghana that roughly 80 % of imported devices classified for reuse are simply scrapped.

Computers and other electronics that can no longer be used contain valuable materials when devices are properly dismantled and recycled.

A ton of used mobile phones, for example - or approximately 6,000 handsets (a tiny fraction of today's 1 billion annual production) -- contains about 3.5 kilograms of silver, 340 grams of gold, 140 grams of palladium, and 130 kg of copper, according to StEP. The average mobile phone battery contains another 3.5 grams of copper. Combined value: over US $15,000 at today's prices.

Recovering these metals with state-of-the art recycling processes generates a small fraction of the CO_2 emissions, land degradation and hazardous emissions caused by mining them.

Recovering 10 kilograms of aluminum via recycling, for example, uses no more than 10% of the energy required for primary production, preventing the creation of 13 kilograms of bauxite residue, 20 kilograms of CO_2, and 0.11 kilograms of sulphur dioxide emissions, and causes many other emissions and impacts.

Other components in e-waste like indium and coltan are increasingly hard to find but vital to electronics manufacturing.

China: 2 million backyard e-waste recyclers

UNU researcher Feng Wang estimates that of the 20 million people (roughly equal to the population of Australia) engaged in China’s waste

management, 2 million are involved in the informal collection, re-use and recycling of e-waste.

All too often, e-scrap in developing countries is incinerated to recover metals, not only wasting much-needed resources but adding dangerous heavy metals, toxic dioxins, furans and polycyclic aromatic hydrocarbons (PAHs) to the environment, both local and global.

Though China has banned e-waste imports, it is still one of the world's major dumping grounds for e-waste from other countries, says Mr. Wang. In addition, China produces prodigious volumes of e-waste domestically (an estimated 2.3 million tonnes next year; second only to the United States with an estimated 3 million tonnes).

Rising environmental damage and health problems among those involved has prompted China, like many other countries, to initiate an ambitious new formal and regulated processes for managing e-waste with efficient, large scale facilities.

Mr. Wang is contributing to research into innovative and profitable models to help China ensure proper e-waste recycling, from the collection of equipment from households to the expansion of recycling facilities.

Source: United Nations University