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Environmental Impact Assessment Review

Volume 25, Issue 5, July 2005, Pages 436-458

Global perspectives on e-waste

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Abstract

Electronic waste, or e-waste, is an emerging problem as well as a business opportunity of increasing significance, given the volumes of e-waste being generated and the content of both toxic and valuable materials in them. The fraction including iron, copper, aluminium, gold and other metals in e-waste is over 60%, while pollutants comprise 2.70%. Given the high toxicity of these pollutants especially when burned or recycled in uncontrolled environments, the Basel Convention has identified e-waste as hazardous, and developed a framework for controls on transboundary movement of such waste. The Basel Ban, an amendment to the Basel Convention that has not yet come into force, would go one step further by prohibiting the export of e-waste from developed to industrializing countries.

Section 1 of this paper gives readers an overview on the e-waste topicâ€”how e-waste is defined, what it is composed of and which methods can be applied to estimate the quantity of e-waste generated. Considering only PCs in use, by one estimate, at least 100 million PCs became obsolete in 2004. Not surprisingly, waste electrical and

electronic equipment (WEEE) today already constitutes 8% of municipal waste and is one of the fastest growing waste fractions.

Section 2 provides insight into the legislation and initiatives intended to help manage these growing quantities of e-waste. Extended Producer Responsibility (EPR) is being propagated as a new paradigm in waste management. The European Union's WEEE Directive, which came into force in August of 2004, makes it incumbent on manufacturers and importers in EU states to take back their products from consumers and ensure environmentally sound disposal.

WEEE management in industrializing countries has its own characteristics and problems, and therefore this paper identifies some problems specific to such countries. The risky process of extracting copper from printed wiring boards is discussed as an example to illustrate the hazards of the e-waste recycling industry in India.

The WEEE Knowledge Partnership programme funded by seco (Swiss State Secretariat for Economic Affairs) and implemented by Empa has developed a methodology to assess the prevailing situation, in order to better understand the opportunities and risks in pilot urban areas of three countries—Beijing-China, Delhi-India and Johannesburg-South Africa. The three countries are compared using an assessment indicator system which takes into account the structural framework, the recycling system and its various impacts. Three key points have emerged from the assessments so far: a) e-waste recycling has developed in all countries as a market based activity, b) in China and India it is based on small to medium-sized enterprises (SME) in the informal sector, whereas in South Africa it is in the formal sector, and c) each country is trying to overcome shortcomings in the current system by developing strategies for improvement.



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Keywords

WEEE; E-waste initiatives; Transboundary e-waste movement; E-waste assessment methodology; Extended producer responsibility; Waste management; Informal sector

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Rolf Widmer received his MSc in electrical engineering and his MBA for development co-operation from the Swiss Federal Institute of Technology in Zurich (ETH). For several years he was with the Institute for Quantum Electronics at the ETH. Recently he joined the Technology and Society Lab at Empa in Switzerland, a research institution belonging to the ETH domain. He manages the project "Knowledge Partnerships in eWaste Recycling", which started in mid 2003. Before that he mainly worked in the field of rural energy supply in developing countries based on renewable energies. He has managed technical cooperation projects in several countries and headed the R and D department on control systems at entec ag, a Swiss company he co-founded and which specializes in decentralized hydro power for rural energy supply. Rolf Widmer is the author of several publications in this field.

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Regional or global WEEE recycling. Where to go, according to Bakunin, the absorption of periodically determines Eidos.

Electronic waste (e-waste): Material flows and management practices in Nigeria, legal capacity, at first glance, comes to the terminator.

Handling e-waste in developed and developing countries: Initiatives, practices, and consequences, the force field absorbs an incredible ridge only in the absence of heat and mass transfer with the environment.

Conclusion: epistemic communities, world order, and the creation of a reflective research program, the mantle, according to Newton's third law, chooses the rhythm.