



Increased efforts needed to manage waste mobile phones

Consumers, manufacturers and government all need to take responsibility for managing the increasing number of waste mobile phones, according to new research. Results indicated that levels of copper, lead, arsenic and mercury released through the disposal of waste phones are potentially toxic to health and the environment.

Mobile phones have a high content of heavy metals, which are harmful to both humans and the environment. The rate of development within the industry is rapid, and consumers are constantly changing their mobile phone for the latest model, which leads to a large quantity of mobile phones going to waste. Evaluating the toxic potential of metals contained within waste phones could help design phones with less environmental impact and more effective waste management strategies.

The study estimated the average toxicity of a typical mobile phone based on the level of heavy metals present in 34 different models. It then evaluated the potential toxic effects of this level of metal if the phone is either incinerated or sent to landfill.

15 heavy metals were detected in the 34 models. Copper was present in the greatest amount with an average of 10g per phone. Three carcinogenic metals were present, with the most toxic being arsenic and lead. 14 metals could potentially harm human health by contributing to non-carcinogenic diseases, including respiratory and developmental problems, particularly copper and lead. Finally, 14 metals that can damage the environment were present, with the most toxic being copper and mercury.

Overall, the research indicated that arsenic, lead, copper and mercury are the main metals that contribute to the toxicity of waste mobile phones. Based on this information, components that contain these metals could be exchanged for components that contain safer materials. For example, lead is currently used in the solder in the wiring board in mobile phones, but it could be possible to use lead-free solder. However, if alternative materials or components are not available, then heavy metals in waste phones should be recovered through recycling.

The research acknowledged that effective waste management requires consumer, corporate and government responsibility. Consumers should change purchasing behaviour to prevent excessive consumption. They also need to be motivated to recycle or take-back their phones once they are replaced. Manufacturers also have responsibility to recycle phones and the EU Waste Electronic and Electronic Equipment Directive¹ has set corporate targets for this.

However, care must be taken that the costs incurred by companies in improving waste management does not result in them reducing their investment in improving the environmental impact of their products through choosing less toxic materials. In other words, design changes that lead to improved recyclability may not always lead to less environmental impact. Lastly, government has the responsibility to establish and implement waste management systems and educate consumers and industry.

More specifically, the study recommended two strategies to integrate consumer, corporate and government responsibilities. Environmental taxation on mobile phones would motivate consumers to buy less and replace less. This tax would increase with the environmental impact of the phone and so would also drive manufacturers to produce more environmentally responsible phones to increase their competitiveness. A deposit-refund system could motivate consumers to return mobile phones when they no longer want them. Both of these should go hand-in-hand with appropriate education programmes on the environmental impact of waste mobile phones.

1. See: http://ec.europa.eu/environment/waste/weee/legis_en.htm

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