Recycling of Network Equipment and Mobile Phones

Mobile communications network equipment and consumer devices can in many cases be refurbished and re-used or successfully recycled at end-of-life. Recycling ensures that precious materials can be reused, avoiding the extraction of new raw materials. An environmentally sound recycling process will also ensure that potentially toxic materials are disposed of in a safe manner.

Design for easier recycling, effective take-back systems and consumer awareness maximize the benefits of the recycling process. The mobile industry recognizes that it has an important role in responsible end-of-life environmental management when looking at the overall environmental impacts of mobile communications.

Mobile Phone Take-Back

The average useful design life of a mobile handset is around seven years, yet users in developed countries typically replace their phones about every 18 months driven by both the evolution of technology and the tendency of consumers to want a device with more applications.

A 2008 survey of 6,500 people in 13 countries reported that 44% kept their old phone, 25% gave it to friends or family, 16% sold their used phone (especially in emerging markets), 3% are recycled and 4% are thrown into landfill.

Consumers should be encouraged to avoid throwing away a phone with unsorted household waste but rather to give it to a recognised take-back scheme. Typically more than 70% of collected handsets from developed markets can be refurbished.

In most cases take-back schemes were established as voluntary initiatives, with self-sustaining financial structures. Designing a successful take-back schemes will depend on many issues, including national infrastructure, the regulatory environment and whether a tradition of recycling exists.

Once collected, phones need to be evaluated to determine whether they are suitable for reuse, with or without further repair. The main destinations for refurbished devices are Latin America, Eastern Europe, China, India and Africa. It has been forecast that 100 million reused phones will ship in 2012.

Each year only a small percentage of phones go to end-of-life recycling. During recycling the batteries may first be separated from the mobile phone and sorted into their various types before reprocessing by specialist recyclers. The rest of the handset may be dismantled by manual and/or mechanical separation of components or directly placed into high-temperature integrated metal smelters with efficient controls for the separation of metals and removal of waste gas. Plastic components come in mixed grades and contain dyes or other contaminants, which may make these parts difficult to reuse. Such plastic components are incinerated in special facilities and energy recovered.

1 Earth Calling…The Environmental Impacts of the Mobile Telecommunications Industry, Forum for the Future, 2006.

The metals extracted during this process – including gold, platinum, palladium and silver – are put back into productive use. About 16% (by weight) of a typical mobile phone is considered 'high value' materials. However, the quantities of some of these materials – gold for example – has reduced over time due to advances in manufacturing techniques.

1 tonne of circuit boards yields about the same amount of gold as 110 tonnes of gold ore. The US Geological Service estimates that each phone contains about US$0.40 worth of gold

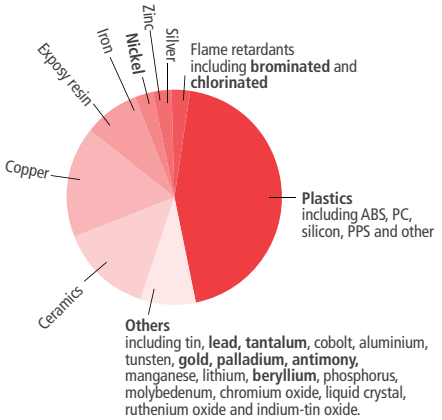
Network Equipment Recycling
The supply contracts for network equipment upgrades increasingly contain provisions for take-back and reuse or recycling of the replaced equipment. There is a significant international market in refurbished mobile network equipment.

Nickel cadmium, nickel metal hydride and lithium ion/polymer batteries have their metals recovered and reused in products such as power tools, saucepans and new batteries.

Environmentally sound treatment of end-of-life electronic equipment requires sophisticated facilities that cannot be duplicated in every country. Therefore, end-of-life equipment will need to be exported, under appropriate authorisations, to the few suitable plants. The mobile industry welcomes efforts by authorities to tackle illegal export of end-of-life electronic equipment to countries that lack the necessary infrastructure. However, the introduction of unnecessary barriers for companies demonstrating good practices should be avoided.

80% of a phone can be recycled or energy recovered. The remainder can be used in inert construction aggregates.

Materials in a typical mobile phone (by volume)[1]



Mobile phone take-back is available in many countries

Where to go for more information

GSMA website: **www.gsmworld.com/environment/**

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