Environmental Impact of Mobile Communications Devices

Since the introduction of modern mobile telephony in the 1980s, there have been dramatic reductions in weight and changes in battery chemistry that have reduced the natural resources required, both in terms of energy and materials in the whole production process, customer use and final end-of-life.

The first mobile phones were so large and heavy that they were usually installed only in motor vehicles, wired into their electrical systems. The first generation of truly portable phones was still large and heavy; containing lead acid batteries and came with carrying bags with shoulder straps, and weighed upwards of 4 kg. These devices progressed steadily to smaller, lighter models in the 1980s and today mobile phone handsets typically weigh less than 100g.[1]

Materials

In response to regulatory mandates in Europe and other parts of the world, the mobile industry has moved to phase out potentially hazardous substances. As an example, lead was used in mobile phones, although in very small quantities, in tin-lead solder, which very efficiently bonded components into integrated electronic devices. Although the amount of tin-lead solder in a mobile phone was typically less than one gram per phone, mobile phones no longer use tin-lead solder in their electronics.

Mobile phones are global products and as other countries around the world implement their own form of materials legislation, it is important that there is a harmonized approach both to the list of controlled materials and the procedures for assuring compliance.

Plastics are another area of significant manufacturer research. Existing plastics can be difficult to reuse, especially if they are contaminated by paints or embedded metal parts. Manufacturers are exploring ways to improve ease of recycling and also testing the suitability of bio-plastics made from plant materials that could be composted.

Energy Used

The environmental impacts of mobile communications devices needs to viewed across their entire lifecycle in terms of the resources and energy they use. With regards to their manufacturing and usage, the United Nations Environment Programme[2] estimates that the manufacture of a mobile phone produces about 60 kg of CO2e and that using a mobile phone for a year produces about 122 kg of CO2e.[3]

1 Guideline on the Awareness Raising-Design Considerations (Revised and Approved Draft). Mobile Phone Partnership Initiative Project 4.1., Basel Convention, United Nations Environment Program, 15 May 2008.

2 Kick the Habit – A UN Guide to Climate Neutrality, United Nations Environment Programme, 2008.

3 CO2e = carbon dioxide equivalent. The global warming potential of all greenhouse gases is measured in terms of the equivalent impact of carbon dioxide (CO2).

4 Life-time energy consumption includes the energy during manufacture, transport, use and final disposal. Estimate from Stage III Final Report: Evaluation of Options to Improve the Life-Cycle Environmental Performance of Mobile Phones, European Commission Integrated Product Policy Pilot on Mobile Phones, April 2006.

The main impact associated with day to day mobile phone use is the power used during the charging process. The charger represents about 7% of the life-time energy consumption of a typical mobile phone.[4] Industry is continuing to work on reducing standby power consumption and losses associated with charging. Consumers can make a substantial contribution by simply switching off and unplugging the charger when it is not needed.

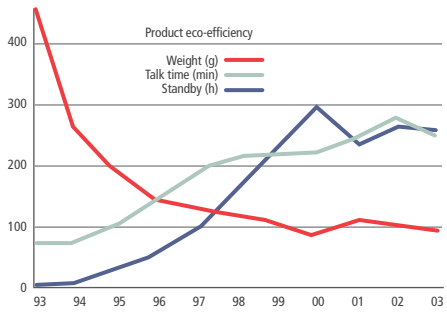
If 10% of the world's mobile phone users turned off their chargers after use, the energy saved in one year could power 60,000 European homes.

The standby operating time of a mobile phone on a single battery charge has increased from around 4 hours to up to 12 days or more, while the size of batteries has been greatly reduced. This has been accomplished through changes in battery chemistry and reductions in the overall energy requirements of the circuitry.

A modern mobile phone now communicates with data as well as voice, offers email and internet browsing, and may also serve as multi-function personal digital assistant, digital still and video camera, MP3 music player, pager, alarm clock, global positioning device, and game machine. A multipurpose mobile phone can remove the need for some consumers to buy many additional electronic devices.

Evolution in phone sizes.

Eco efficiency of typical mobile phones 1993-2003



Where to go for more information

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

GSMA Head Office 1st Floor Mid City Place 71 High Holborn London WC1V 6EA United Kingdom Tel: +44 (0)20 7759 2300

8 May 2009