



Life Cycle of a Cell Phone

Cell Phones are only used for an average of 18 months before being replaced—even though they can function for much longer.

1. Materials Extraction

A cell phone is made up of many materials. Handsets generally consists of 40 percent metals, 40 percent plastics, and 20 percent ceramics and trace materials.

Circuit boards are made from mined materials containing copper, gold, lead, nickel, zinc, beryllium, tantalum, coltan, and other metals. The manufacturing process requires crude oil for plastic, and sand and limestone for fiberglass. Many of these materials are known as “persistent toxins” and can stay in the environment for long periods of time. Various liquid crystalline substances, either naturally occur-

ring (such as mercury) or human-made, are used to make Liquid Crystal Displays (LCDs). LCDs also require the use of glass or plastic. Cell phones can use several types of batteries: nickel-metal hydride (Ni-MH), lithium-ion (Li-Ion), nickel-cadmium (Ni-Cd), or lead acid. Ni-MH and Ni-Cd batteries contain nickel, cobalt, zinc, cadmium, and copper. Li-Ion batteries use lithium metallic oxide and carbon based materials, all mined from the earth.

2. Materials Processing

Most raw materials must be processed before being used by cell manufacturers. For example:

- Crude oil is combined with natural gas and chemicals in a processing plant to make plastic components.
- Copper is mined, ground, heated, and treated with chemicals and electricity to isolate the pure metal used to make circuit boards, batteries, and wires.

4. Packaging and Transportation

Cell phones and cell parts need packaging and transportation to get from one place to another. Commercial transportation requires the use of fossil fuels that contribute to climate change.

While packaging protects products from damage, identifies contents, and provides information, excessive or decorative packaging can be wasteful. Packaging consumes valuable natural resources, such as trees, oil, aluminum or other materials, all of which use energy to produce and can result in waste. Packaging can instead be made from recycled materials.

3. Manufacturing

Plastics and fiberglass are used to make the basic shape of the circuit board, which is then coated with gold plating. The board is also composed of several electronic components, connected with circuits and wires that are soldered to the board and secured with protective glues and coatings.

LCDs are manufactured by sandwiching liquid crystal between layers of glass or plastic.

Batteries consist of two separate parts, called electrodes, made from two different metals. A liquid substance, called electrolytes, touches each electrode. When an outside sources of electricity such as an outlet is applied, chemical reactions between the electrodes and the electrolytes cause an electric current to flow, give batteries their power.

5. Useful Life

Although US regulations allow consumers to transfer their phone number to a new phone company, most US cell providers have unique technologies in their phones that only work in their own networks. Switching cell phone providers usually means you must purchase a new phone. One way to extend the useful life of your phone and prevent waste is to use the same company for continuing phone service. Always comparison-shop to be sure you get the service and phone that's right for you.

You can also extend the life of your phone by taking care of it— use a cell phone case, avoid: drops, extreme temperatures, and liquids.

6. End-of-Life

Donating or recycling cell phones when you no longer need or want them extends their useful lives, and prevents them from ending up in the trash where they can potentially cause environmental problems.

Reuse

Many organization—including recyclers, charities, and electronics manufacturers—accept working cell phones and offer them to schools, community organizations, and individuals in need. Reuse gives people, who could not otherwise afford them, free or reduced cost access to new phones and their accessories. Plus, it extends the useful lifetime of a phone.