

Factsheet #3

Mobile Phone Manufacturing

Understanding how mobile phones are manufactured can help you make environmental choices about the products you use, and how you dispose of them. Like any product, making a mobile phone uses natural resources and energy, which can have a harmful impact on our air, land, and water.

Extracting Materials

To make mobile phones, manufacturers first need to extract raw materials from the earth. They are then used to make each component of the mobile phone:

Circuit Board

This is the 'brain' of the phone, like a computer. They consist of many wires or circuits made of metal, located on a plastic or fibreglass board.

- Crude oil is extracted from the earth to make plastics, silicon and other materials to that are used to make the circuit boards.
- Metals such as copper, gold, lead, nickel, zinc, beryllium, tantalum and other metals are mined from the earth to make components that are used to make the board.
- Many of the raw materials that are used in the manufacturing of the circuit board contain substances that can be potentially harmful to the environment if they are buried in landfill.

Liquid Crystal Display (LCD)

This is the display on a phone that shows numbers, images and other information.

- They are made using plastic, glass, liquid crystalline and mercury. Mercury is a heavy metal which can potentially be harmful to the environment if it ends up in landfill.
- Resources extracted from the earth like oil, sand and liquid crystalline materials are non-renewable.

Batteries

MUSTERKIDS[®]

These power the phone and are usually rechargeable.

- There are many different types of rechargeable batteries, such as: nickel-metal hydride (Ni-MH), lithium-ion (Li-Ion), nickel-cadmium (Ni-Cd), or lead acid.
- They all contain materials, which are mined from the earth. These include nickel, cobalt, zinc, cadmium, copper, lithium, metallic oxide and other carbon-based materials.

Processing Materials

Once the raw materials have been extracted from the earth they need to be processed in order to make the materials and components that go into a mobile phone.

- To make the plastic cases and other plastic parts, crude oil is combined with natural gas and chemicals in a processing plant to make plastic.
- Copper is mined, ground, heated, and treated with chemicals and electricity to refine the pure metal used to make circuit boards and batteries. The copper pieces are shipped to a manufacturer where they are formed into wires.
- Processing of the raw materials uses valuable energy, emits greenhouse gases and can potentially generate other by products that need to be controlled so they don't end up in the environment polluting our air and waterways.

Manufacturing

Now that all the resources from the earth have been processed into materials used in the components that go into a mobile phone, the manufacturer can start making the phone.

- Plastics and fiberglass are used to make the circuit board, which is then coated with gold plating. The board is also composed of several electronic components, connected with circuits and wires made of copper, which are soldered to the board and secured with protective glues and coatings.
- The LCD screens are manufactured by layering liquid crystal between layers of glass or plastic.
- Batteries consist of two separate parts, called electrodes, made from two different types of metals. A liquid substance, called electrolytes, touches each electrode. When electricity is applied, like a phone charger, chemical reactions between the electrodes and the electrolytes cause an electric current to flow, giving batteries their power.