



Micro-factory

Innovation > Science > New micro-factory brings recycling to electronics

NEW MICRO-FACTORY BRINGS RECYCLING TO ELECTRONICS



SCIENCE

A newly developed micro-factory can recycle e-waste on site to reduce environmental impact and enhance community benefits.

Around 1.5 billion phones are sold each year, which means that a huge number of phones are also thrown away each year. Once trashed, the phones often end up in landfills, leaching toxic chemicals into the soil. In fact, electronics account for as much as 70 percent of toxic waste in most landfills. Recycling is one answer, but recycling electronics can be expensive, time consuming and requires a large amount of industrial space. Now, the [Centre for Sustainable Materials Research and Technology \(SMaRT\)](#) at Australia's [University of New South Wales](#), has launched a micro-factory aimed at recycling e-waste in a small space.

The SMaRT micro-factory can operate on a site as small as 50 square metres. This means it can be taken to wherever e-waste is stockpiled. The SMaRT recycler is stocked with small, modular machines and devices that each perform several functions. Electronic devices are first broken down, then moved to a module that identifies useful parts. Another module contains a small furnace which can extract valuable materials using precisely controlled temperatures. Plastics can be put through a module that produces filaments for 3D-printing. Metal alloys can also be extracted for use in the manufacturing processes.

The e-waste micro-factory is just the first of what SMaRT hopes will be a series of factories recycling products such as glass, plastic and timber. SMaRT, Centre Director, Professor Veena Sahajwalla says, "Using our green manufacturing technologies, these microfactories can transform waste where it is stockpiled and created ... to develop a commercial opportunity from the valuable

materials that are created". New techniques for recycling are allowing a wide range of materials to be repurposed. These techniques include turning [used chewing gum](#) into new products and creating [recyclable bricks](#). What other types of materials would benefit from the SMaRT micro-factory approach?

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