 

**Resources for Advanced Global Citizenship Challenge: Environment**

**Theme: Natural Environment**

**Electronic waste or e-waste is one of the rapidly growing problems of the world. E-waste components can contain toxic substances that can have adverse effects on human health and the environment.**

**Identify the threats and dangers posed to human life and to the environment through the dumping of e-waste.**

**Research the effects that poor e-waste management is having on the planet and especially on the poorer nations of the world.**

[**http://www.independent.co.uk/news/uk/home-news/grim-forecast-for-ewaste-as-technology-trash-to-top-65m-tons-by-2017-9005446.html**](http://www.independent.co.uk/news/uk/home-news/grim-forecast-for-ewaste-as-technology-trash-to-top-65m-tons-by-2017-9005446.html)

Grim forecast for e-waste as technology trash to top 65m tons by 2017

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Grim forecast for e-waste as technology trash to top 65m tons by 2017



More recycling would lessen the danger of the Third World dealing with our electronic junk – and create opportunities for us

[**JONATHAN OWEN**](http://www.independent.co.uk/search/simple.do?destinationSectionUniqueName=search&publicationName=ind&pageLength=5&startDay=1&startMonth=1&startYear=2010&useSectionFilter=true&useHideArticle=true&searchString=byline_text:(%22Jonathan%20Owen%22)&displaySearchString=Jonathan%20Owen)

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They are on our person, in our homes and in our workplaces, many of them harbouring heavy metals and toxic materials which are dangerous to people and the environment unless they are properly recycled.

Yet the soaring international demand for electric and electronic products is fuelling a global rise in e-waste, which is set to reach 65.4 million tons annually by 2017.

The grim forecast is from a new study released today, which has mapped more than 180 countries.

It reveals that, in only five years, the yearly amount of e-waste will rise 33 per cent from the 49 million tons of used electrical and electronic items generated last year.

The figure is based on data from a new world map created by the Solving the E-Waste Problem (StEP) initiative, a coalition of UN organisations, industry, governments, NGOs and science bodies.

It has looked at the amount of electrical and electronic equipment sold around the world and the amount of waste electrical and electronic equipment (Weee) generated.

Worldwide, the US is the worst offender – with 9.4 million tons of e‑waste each year, with some 26,500 tons being sent to poorer countries each year.

Mobile phones form the bulk of the 14 million used electronic products exported, with most used phones destined for Hong Kong, and countries in Latin America and the Caribbean. Old computers are generally sent to Asian countries, while heavy items such as TVs and computer monitors end up in places such as Mexico, Venezuela, Paraguay and China.

Another contributor to the global e‑waste mountain is China, producing some 7.3 million tons a year and ranked second in the world after the US for its volume of e-waste.

Britain is another major contributor, ranking sixth in the world in terms of the total amount - creating about 1.4 million tons of waste a year. From unwanted flat-screen TVs to mobile phones, from fridges to microwaves, the UK is the worst offender in the EU. And Britain is also among the worst-performing countries regarding the amount of e-waste produced per head of population. Britain ranks 22nd – at 21.8kg a year.

“Although there is ample information about the negative environmental and health impacts of primitive e‑waste recycling methods, the lack of comprehensive data has made it hard to grasp the full magnitude of the problem,” says Ruediger Kuehr, StEP’s executive secretary. Having a more accurate idea of the scale of waste will help “lead to better awareness and policy-making”, he adds.

But while governments struggle to deal with the problem, the cost of safely disposing of such materials has resulted in large quantities of e‑waste exported to developing countries where it is often simply dumped or broken down for scrap – often by child workers exposed to dangerous fumes from crude attempts to burn off materials.

A Greenpeace spokesperson said: “E-waste is often dumped in countries like Ghana, Nigeria, Pakistan, Vietnam or China, where there are no facilities for effective recycling. Often plastics are burnt to recover copper and other metals, creating highly toxic dioxins. High levels of cadmium and lead from monitor glass are found in high concentrations in e-waste dumps.”

Electronic waste is the fastest-growing waste stream in the UK, according to the Department for Environment, Food and Rural Affairs (Defra). And it represents a massive loss of valuable materials.

Ten million tons of electronic products will be bought in the UK in the next six years alone. This amount will include 20 tons of gold, 400 tons of silver and seven tons of platinum-group metals – worth some £1.5bn, says Defra.

Every year, people are not only getting rid of perfectly good electronic products, but are also throwing away money by doing so. A quarter of the products taken to waste recycling centres are in working order and could be resold for an estimated £200m each year.

A new report by Wrap (Waste & Resources Action Plan), an independent body created by the Government to promote recycling, reveals that hundreds of thousands of tons of e‑waste are being dumped in landfills across the country.

Every year, the average household in the UK spends about £800 on new electrical and electronic goods. This equates to about 1.4 million tons of electrical and electronic goods. A similar amount is thrown away, according to the report. “Nearly 40 per cent goes to landfill and less than 10 per cent is reused, despite the fact that much of it either works or could be repaired,” it states.

The scale of waste is “a missed opportunity for businesses and consumers”, says the report.

Changing how we design, make, buy and dispose of electrical and electronic equipment could not only reduce Britain’s carbon footprint by up to 15 per cent, but also add £800m to the UK economy, it claims. Dr Liz Goodwin, Wrap chief executive, says: “The amount that we’re throwing away is incredible – a sheer waste of precious resources.” There are “clear advantages”, she adds, “to changing the way electrical and electronic products are made and sold ... keeping the products in use for longer and offsetting the global impact of making new products”.

Wrap is now working with a number of leading retailers and manufacturers such as Apple, Electrolux and Samsung to develop a sustainable electricals action plan to be launched next summer. This aims to improve the sustainability of electrical products by developing “industry standard” guidance on design and buying specifications for major household appliances aimed at extending their life. And businesses are being urged to adopt a “trade-in” system for goods that could otherwise be thrown away. Britons have at least £1bn worth of electrical and electronic equipment in their homes that is no longer used. The market for trading pre-owned equipment could be worth up to £3bn, says Wrap.

As well as any “trade-in” value, there’s hidden gold, literally, in today’s gadgets. “There’s more gold in a ton of used mobile phones than there is in a ton of gold ore,” says Steve Lee, chief executive at the Chartered Institute of Waste Management. “There has been a ‘buy today, bin tomorrow’ mentality, but people are starting to recognise that old electronic equipment is either valuable or important – someone else can get some value out of it.”

He adds that the “biggest concern” is the potential health impacts on those doing the low-grade recovery overseas. “You can’t imagine anyone in Europe smelting circuit boards in a wok, but it happens elsewhere.”

Amid mounting concern over the levels of waste, and need to recycle them safely, Britain will be the first EU country to implement strengthened European regulations on Weee next year. The legislation, which comes into effect in the UK from 1 January, will raise the targets for collection, treatment and recycling of waste electrical products.

By 2016, member states will have to collect, treat and recycle 45 per cent of the electronic products placed on the market. The amount Britain currently collects “roughly equates to 35 per cent by weight under the new targets”, according to a spokesperson for the Department for Business. “This means we will have to increase our collection in the next two and a half years from 35 to 45 per cent. We think we will meet this target when we implement the new directive.”

<http://edition.cnn.com/2013/05/30/world/asia/china-electronic-waste-e-waste/>

China: The electronic wastebasket of the world

**By Ivan Watson, CNN**

Updated 0154 GMT (0854 HKT) May 31, 2013

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**Where your used electronics go in China** 03:38

**Story highlights**

* U.N. report: "China now appears to be the largest e-waste dumping site in the world"
* Products originally produced in China are now finding their way back as electronic junk
* The small town of Guiyu as been a major hub for the disposal of e-waste
* "When recycling is done in primitive ways ... it is hugely devastating for the local environment"

Did you ever wonder what happens to your old laptop or cellphone when you throw it away?

Chances are some of your old electronic junk will end up in China.

According to a [recent United Nations report](http://ourworld.unu.edu/en/assessing-and-improving-the-e-waste-problem-in-china/), "China now appears to be the largest e-waste dumping site in the world."

E-waste, or electronic waste, consists of everything from scrapped TVs, refrigerators and air conditioners to that old desktop computer that may be collecting dust in your closet.

Many of these gadgets were initially manufactured in China. Through a strange twist of global economics, much of this electronic junk returns to China to die.

"According to United Nations data, about 70% of electronic waste globally generated ended up in China," said Ma Tianjie, a spokesman for the Beijing office of Greenpeace.

"Much of [the e-waste] comes through illegal channels because under United Nations conventions, there is a specific ban on electronic waste being transferred from developed countries like the United States to countries like China and Vietnam."

For the past decade, the southeastern town of Guiyu, nestled in China's main manufacturing zone, has been a major hub for the disposal of e-waste. Hundreds of thousands of people here have become experts at dismantling the world's electronic junk.

On seemingly every street, laborers sit on the pavement outside workshops ripping out the guts of household appliances with hammers and drills. The roads in Guiyu are lined with bundles of plastic, wires, cables and other garbage. Different components are separated based on their value and potential for re-sale. On one street sits a pile of green and gold circuit boards. On another, the metal cases of desktop computers.

At times, it looks like workers are reaping some giant plastic harvest, especially when women stand on roadsides raking ankle-deep "fields" of plastic chips.

In one workshop, men sliced open sacks of these plastic chips, which they then poured into large vats of fluid. They then used shovels and their bare hands to stir this synthetic stew.

"We sell this plastic to Foxconn," one of the workers said, referring to a Taiwanese company that manufactures products for many global electronics companies, including Apple, Dell and Hewlett-Packard.

**Dirty, dangerous work**

This may be one of the world's largest informal recycling operations for electronic waste. In one family-run garage, workers seemed to specialize in sorting plastic from old televisions and cars into different baskets. "If this plastic cup has a hole in it, you throw it away," said a man who ran the operation, pointing to a pink plastic mug. "We take it and re-sell it."

But recycling in Guiyu is dirty, dangerous work. "When recycling is done properly, it's a good thing for the environment," said Ma, the Greenpeace spokesman in Beijing.

"But when recycling is done in primitive ways like we have seen in China with the electronic waste, it is hugely devastating for the local environment."

According to the April 2013 U.N. report "E-Waste in China," Guiyu suffered an "environmental calamity" as a result of the wide-scale e-waste disposal industry in the area.

Much of the toxic pollution comes from burning circuit boards, plastic and copper wires, or washing them with hydrochloric acid to recover valuable metals like copper and steel. In doing so, workshops contaminate workers and the environment with toxic heavy metals like lead, beryllium and cadmium, while also releasing hydrocarbon ashes into the air, water and soil, the report said.

For first-time visitors to Guiyu, the air leaves a burning sensation in the eyes and nostrils.

**Toxic tech**

Studies by the Shantou University Medical College revealed that many children tested in Guiyu had higher than average levels of lead in their blood, which can stunt the development of the brain and central nervous system.

Piles of technological scrap had been dumped in a muddy field just outside of town. There, water buffalo grazed and soaked themselves in ponds surrounded by piles of electronic components with labels like Hewlett-Packard, IBM, Epson and Dell.

The enormous animals casually stomped through mounds of sheet glass, which clearly had been removed from video monitors.

Flat screen displays often use mercury, a highly toxic metal.

"Releases of mercury can occur during the dismantling of equipment such as flat screen displays," wrote Greenpeace, [in a report titled "Toxic Tech."](http://www.greenpeace.org/international/PageFiles/25502/recyclingelectronicwasteindiachinafull.pdf) "Incineration or landfilling can also result in releases of mercury to the environment...that can bioaccumulate and biomagnify to high levels in food chains, particularly in fish."

Most of the workers in Guiyu involved in the e-waste business are migrants from destitute regions of China and poorly educated. Many of them downplayed the potential damage the industry could cause to their health.

They asked only to use their family names, to protect their identity.

"Of course it isn't healthy," said Lu, a woman who was rapidly sorting plastic shards from devices like computer keyboards, remote controls and even computer mice. She and her colleagues burned plastic using lighters and blow-torches to identify different kinds of material.

"But there are families that have lived here for generations ... and there is little impact on their health," she said.

Several migrants said that while the work is tough, it allows them more freedom than working on factory lines where young children are not permitted to enter the premises and working hours are stringent.

**Used to be worse**

Despite the environmental degradation and toxic fumes permeating the air, many in Guiyu said that conditions have improved dramatically over the years.

"I remember in 2007, when I first came here, there was a flood of trash," said Wong, a 20-year-old man who ferried bundles of electronic waste around on a motorcycle with a trailer attached to it.

"Before people were washing metals, burning things and it severely damaged people's lungs," Wong added. "But now, compared to before, the [authorities] have cracked down pretty hard."

But residents who did not work in the e-waste business offered a very different take on the pollution in Guiyu.

A group of farmers who had migrated from neighboring Guangxi province to cultivate rice in Guiyu told CNN they did not dare drink the local well water.

They claimed if they tried to wash clothes and linens with the water, it turned fabrics yellow.

The head of the group, who identified himself as Zhou, had another shocking admission.

"It may not sound nice, but we don't dare eat the rice that we farm because it's planted here with all the pollution," Zhou said, pointing at water-logged rice paddy next to him.

Asked who did eat the harvested rice, Zhou answered: "How should I know? A lot of it is sold off ... they don't dare label the rice from here as 'grown in Guiyu.' They'll write that its rice from some other place."



**Pollution causing cancer in this village?**

Not that surprising considering that the latest food scandal to hit the country earlier this month is cadmium-laced rice. Officials in Guangzhou city, roughly 400 kilometers away from Guiyu, found high rates of cadmium in rice and rice products. According to the [city's Food and Drug Administration](http://www.gzfda.gov.cn/business/htmlfiles/gzfda/jdxw/201305/90211.html) samples pulled from a local restaurant, food seller and two university canteens showed high levels of cadmium in rice and rice noodles. Officials did not specify how the contaminated rice entered the city's food supply.

CNN made several attempts to contact the Guiyu town government. Government officials refused to comment on the electronic waste issue and hung up the phone.

However, it did appear that government efforts to restrict imports of foreign waste are reducing the flow of e-trash here.

"Why are they stopping the garbage from reaching us?" asked one man who ran a plastic sorting workshop. "Of course it's hurting our business," he added.

**Domestic e-waste grows**

The Chinese government had some success regulating e-waste disposal with a "Home Appliance Old for New Rebate Program," which was tested from 2009 to 2011.

With the help of generous government subsidies, the program collected tens of millions of obsolete home appliances, according to the U.N.

Even if Chinese authorities succeed in limiting smuggled supplies of foreign garbage, the U.N. warns that the country is rapidly generating its own supply of e-waste.

"Domestic generation of e-waste has risen rapidly as a result of technological and economic development," the U.N. reported. It cited statistics showing an exponential surge in sales of TV's, refrigerators, washing machines, air conditioners and computers in China over a 16-year period.

To avoid a vicious cycle of pollution, resulting from both the manufacture and disposal of appliances, Greenpeace has lobbied for manufacturers to use fewer toxic chemicals in their products.

The organization also has a message for consumers who seem to swap their phones, tablets and other computer devices with increasing frequency.

"Think about where your mobile phone or where your gadgets go," said Ma, the Greenpeace activist.

"When you think about changing [your phone], or buying a new product, always think about the footprint that you put on this planet."

<http://www.theguardian.com/global-development/2013/dec/14/toxic-ewaste-illegal-dumping-developing-countries>

Toxic 'e-waste' dumped in poor nations, says United Nations

Millions of tonnes of old electronic goods illegally exported to developing countries, as people dump luxury items

 Tablets and other electronic goods bought this Christmas are destined to create a flood of 'e-waste'. Photograph: Anthony Upton/Rex Features

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[**John Vidal**](http://www.theguardian.com/profile/johnvidal)

Saturday 14 December 2013 21.30 GMTLast modified on Thursday 22 May 201411.21 BST

Millions of mobile phones, laptops, tablets, toys, digital cameras and other electronic devices bought this Christmas are destined to create a flood of dangerous "e-waste" that is being dumped illegally in developing countries, the UN has warned.

The global volume of electronic waste is expected to grow by 33% in the next four years, when it will weigh the equivalent of eight of the great Egyptian pyramids, according to the UN's [Step initiative](http://www.step-initiative.org/), which was set up to tackle the world's growing e-waste crisis. Last year nearly 50m tonnes of e-waste was generated worldwide – or about 7kg for every person on the planet. These are electronic goods made up of hundreds of different materials and containing toxic substances such as lead, mercury, cadmium, arsenic and flame retardants. An old-style CRT computer screen can contain up to 3kg of lead, for example.

Once in landfill, these toxic materials seep out into the environment, contaminating land, water and the air. In addition, devices are often dismantled in primitive conditions. Those who work at these sites suffer frequent bouts of illness.

An indication of the level of e-waste being shipped to the developing world was revealed by Interpol last week. It said almost one in three containers leaving the EU that were checked by its agents contained illegal e-waste. Criminal investigations were launched against 40 companies. "Christmas will see a surge in sales and waste around the world," says Ruediger Kuehr, executive secretary of Step. "The explosion is happening because there's so much technical innovation. TVs, mobile phones and computers are all being replaced more and more quickly. The lifetime of products is also shortening."

According to the [Step report](http://www.step-initiative.org/), e-waste – which extends from old fridges to toys and even motorised toothbrushes – is now the world's fastest growing waste stream. China generated 11.1m tonnes last year, followed by the US with 10m tonnes, though there was significant difference per capita. For example, on average each American generated 29.5kg, compared to less than 5kg per person in China.

By 2017, Kuehr expects the volume of end-of-life TVs, phones, computers, monitors, e-toys and other products to be enough to fill a 15,000-mile line of 40-tonne lorries. In Europe, Germany discards the most e-waste in total, but Norway and Liechtenstein throw away more per person. Britain is now the world's seventh most prolific producer, discarding 1.37m tonnes, or about 21kg per person. No figures are available from government or industry on how much is exported.

Although it is legal to export discarded goods to poor countries if they can be reused or refurbished, much is being sent to Africa or Asia under false pretences, says Interpol. "Much is falsely classified as 'used goods' although in reality it is non-functional. It is often diverted to the black market and disguised as used goods to avoid the costs associated with legitimate recycling," said a spokesman. "A substantial proportion of e-waste exports go to countries outside Europe, including west African countries. Treatment in these countries usually occurs in the informal sector, causing significant environmental pollution and health risks for local populations," he said.

Few countries understand the scale of the problem, because no track is kept of all e-waste, says the European Environment Agency, which estimates between 250,000 tonnes and 1.3m tonnes of used electrical products are shipped out of the EU every year, mostly to west Africa and Asia. "These goods may subsequently be processed in dangerous and inefficient conditions, harming the health of local people and damaging the environment," said a spokesman.

A [new study by the Massachusetts Institute of Technology](https://dl.dropboxusercontent.com/u/3960397/StEP%20Initiative%20-%20MIT-NCER%20Used%20Electronics%20Flows%20Report%20%28final%29.pdf) suggests that the US discarded 258.2m computers, monitors, TVs and mobile phones in 2010, of which only 66% was recycled. Nearly 120m mobile phones were collected, most of which were shipped to Hong Kong, Latin America and the Caribbean. The shelf life of a mobile phone is now less than two years, but the EU, US and Japanese governments say many hundreds of millions are thrown away each year or are left in drawers. In the US, only 12m mobile phones were collected for recycling in 2011 even though 120m were bought. Meanwhile, newer phone models are racing on to the market leaving old ones likely to end up in landfills. Most phones contain precious metals. The circuit board can contain copper, gold, zinc, beryllium, and tantalum, the coatings are typically made of lead and phone makers are now increasingly using lithium batteries. Yet fewer than 10% of mobile phones are dismantled and reused. Part of the problem is that computers, phones and other devices are becoming increasingly complex and made of smaller and smaller components.

The failure to recycle is also leading to shortages of rare-earth minerals to make future generations of electronic equipment.

<http://sites.nicholas.duke.edu/loribennear/2012/11/15/electronic-waste-disposal/>

[Electronic Waste Disposal](http://sites.nicholas.duke.edu/loribennear/2012/11/15/electronic-waste-disposal/)

*On November 15, 2012, in*[*Regulation*](http://sites.nicholas.duke.edu/loribennear/category/regulation-2/)*,*[*Solid Waste*](http://sites.nicholas.duke.edu/loribennear/category/solid-waste/)*, by Sophie Vos*



A worker rummages through electronic waste for the purpose of salvaging metals and other materials for resale in Guiyu, south China’s Guangdong province, Friday 01 July 2005. Electronic waste, illegally imported here from developed countries, is causing severe environmental damage and exposing workers to highly toxic chemicals and heavy metals. Source: EPA/MICHAEL REYNOLDS

Over the last decade, quality of life and owning electronics have become inextricably linked.  As a result, the production and sale of electronic goods has skyrocketed worldwide.  Due to rapid advances in technology, there is a much wider range of products available and new versions of existing goods are being launched constantly.  Therefore, the rate at which electronics are being discarded (and sheer volume of waste) has increased drastically as well.  This electronic waste, or e-waste, is being exported to developing countries where crude ‘recycling’ techniques expose both the workers and the environment to dangerous chemicals.

*So, How Much E-Waste is Actually out There?*

In the United States, 3 million tons of e-waste (computers, printers, phones, cameras, televisions, refrigerators, etc.) is produced every year.  Globally, e-waste generation is growing by 40 million tons per year (1).  This is equivalent to filling around 15,000 football fields six feet deep with waste!  As unimaginable huge as this figure already is, it is increasing at an alarming rate.

In 2020, it is estimated that in China (which is currently the largest dumping ground), e-waste from computers will have jumped by 200-400% and mobile phones will increase by 700%.  In India, computer waste is predicted to rise by 500% and e-waste from mobile phones will be an astounding 18 times higher than current levels (yes, that is an 1800% jump) (1).  While some state-of-the-art electronic recycling facilities do exist, the majority of this e-waste is being shipped (legally and illegally) to developing countries.

*E-Waste in Developing Countries*

Due to increased safety rules in Western countries, it is 10 times cheaper to export e-waste to developing countries than it is to locally recycle (3).  Though some e-waste exportation is legal, a large portion is illegal.  Electronics exported under the category of ‘used’ or ‘second-hand’ goods are not subject to any restrictions, and numerous other loopholes, export schemes, and corrupt officials have been discovered (4).  In 2005, inspections of 18 European seaports found that approximately 47% of exported waste was illegal and that 23,000 metric tons of e-waste was illegally shipped from the United Kingdom (5).

Common e-waste destinations include China, India, Pakistan, the Philippines, Nigeria, Ghana, and Brazil, just to name a few.  China is by far the most popular dumping ground and receives an estimated 70% of the 20-50 million tons to global e-waste produced yearly (3).  The e-waste industry employs 150,000 people in Guiyu, China, while the scrap yards in Delhi boast 25,000 workers and 20,000 tons of yearly waste (5). These countries create a ‘perfect storm’ for e-waste dumping: cheap and desperate labor with no added cost for health or safety regulations.

*Human Health and Environmental Issues*

It is an undeniable fact that e-waste in “backyard” recycling operations poses a major threat to both human health and the environment.  Valuable metals such as gold and copper can be extracted from electronics, but this recovery process is often done in the cheapest and most unsafe way.

Plastics, which contain heavy metals and flame retardants, are burned in open piles and release deadly dioxin and furans.  Cathode ray tubes (CRTs) are broken with hammers to remove copper, a process that also releases toxic phosphor dust.  Circuit boards are literally cooked over open flames or in shallow pans, exposing workers to lead fumes.  Acid baths are used to extract gold from circuit board chips, spewing even more toxic gases into the air (6).  These processes release a wide variety of heavy metals including lead, cadmium, and mercury into the air, soil, and water (5).

Despite the obviously toxic nature of the most common ‘recycling’ techniques, over 90% of e-waste landfills or dumps have no environmental standards (3).  Unbelievably, Nigeria does not have a single legally licensed landfill despite having a population of 115 million and being a popular e-waste dumping ground (2).  The environmental impacts of unregulated ‘recycling’ sites are evident in polluted groundwater, extremely unsafe levels of lead and mercury in nearby rivers, and toxic emissions that contribute to global warming.

Workers at e-waste sites are usually migrants from extremely poor areas and are often children.  They have little to no access to gloves or face masks and are often too desperate for work or uniformed to care about the health risks.  Workers at e-waste sites are prone to skin rashes, cancer, weakening of the immune system, and respiratory, nerve, kidney, and brain damage (3).  In China’s Guiyu region, workers have extremely high levels of toxic fire retardants in their bodies and over 80% of the children already have lead poisoning.

*What Can You do to Prevent E-Waste Dumping?*

As with any illegal trade, it would be virtually impossible to stop all e-waste exportation and “backyard” recycling operations.  However, you can take measures to ensure that your e-waste is being properly disposed of.  Large consumer electronic stores such as Best Buy and Staples have in-store recycling programs.  You can also find out specific information on nearby certified e-waste recycling programs on your state government’s website.  A list of certified electronics recyclers can also be found through e-Stewards and R2 Solutions.

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(1) http://www.sciencedaily.com/releases/2010/02/100222081911.htm

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(5) <http://www.greenpeace.org/international/en/campaigns/toxics/electronics/the-e-waste-problem/where-does-e-waste-end-up/>

(6) http://www.electronicstakeback.com/wp-content/uploads/Q\_and\_A\_on\_Exporting\_Issues

<http://www.dailymail.co.uk/news/article-3049457/Where-computer-goes-die-Shocking-pictures-toxic-electronic-graveyards-Africa-West-dumps-old-PCs-laptops-microwaves-fridges-phones.html>

**Where your computer goes to die: Shocking pictures of the toxic  'electronic graveyards' in Africa where the West dumps its old PCs, laptops, microwaves, fridges and phones**

* **New report says 41 million metric tonnes of electronic waste worth a staggering £34billion was discarded in 2014**
* **Countries illegally export 'millions of tonnes' of e-waste annually to African nations like Ghana, campaigners say**
* **Shocking photographs from its capital Accra show thousands of discarded appliances in huge, filthy landfill sites**
* **Some contain toxic materials like lead and mercury which damage environment and people sifting through them**

Read more: <http://www.dailymail.co.uk/news/article-3049457/Where-computer-goes-die-Shocking-pictures-toxic-electronic-graveyards-Africa-West-dumps-old-PCs-laptops-microwaves-fridges-phones.html#ixzz3YpYQjnhl>
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<http://www.dailymail.co.uk/news/article-2595966/Think-television-recycled-rid-This-likely-end-dumping-grounds-one-dubbed-worlds-biggest-e-waste-site.html>

**Think your television is recycled when you get rid of it? This is where it is likely to end up... dumping grounds such as this one, dubbed the world's biggest e-waste site**

* **Photographer Kevin McElvaney documented how electrical goods are illegally dumped at Agbogbloshie, in Ghana**
* **He said boys and young men make their living by smashing up devices to search for valuable materials**
* **The work can lead to a range of injuries and illnesses, including lung problems, headaches and insomnia**
* **Mr McElvaney said most of the boys will die from cancer in their 20s, yet even being aware of the dangers does not put many of them off working at the site**

Read more: <http://www.dailymail.co.uk/news/article-2595966/Think-television-recycled-rid-This-likely-end-dumping-grounds-one-dubbed-worlds-biggest-e-waste-site.html#ixzz3YpYoK6UL>
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<http://gov.wales/topics/environmentcountryside/epq/waste_recycling/legislation/wasteelectronic/?lang=en>

**Waste Electrical and Electronic Equipment (WEEE)**

[**Share**](http://www.addthis.com/bookmark.php?v=250&pubid=ra-4d6fbaad4aa8f9d2)

**Last updated 13 March 2015**

**Explains the laws and where to find more information on disposing of electrical and electronic equipment safely.**

Electrical and electronic equipment covers many products such as:

* large and small household appliances like fridges and kettles
* consumer equipment like TVs, radios and DVD players.

The term also applies to power tools, fluorescent lights and children’s toys.

Items which do not use electricity as their main source of power, like gas cookers, are not included.

When these products reach the end of their lives they will be discarded and become waste electrical and electronic equipment (WEEE). Many waste electrical goods contain hazardous substances which can pose a risk to human health and the environment if they are not disposed of correctly.

**The Waste Electrical and Electronic Equipment Regulations 2013**

The Waste Electrical and Electronic Equipment Regulations 2013 came into force in the UK on 1/1/14 and replaced the 2006 regulations. The regulations provide for all WEEE that arises to be collected at designated collection facilities and transported to an approved authorised treatment facility or approved exporter for treatment, recovery, recycling or reuse.

The regulations also provide for the registration of all producers who put EEE on the market in the UK and for the establishment and financing by producers of systems to collect, treat, recover and dispose of WEEE that arises in the UK. Distributors are required to take back certain types of WEEE free of charge, and provide for the approval of designated collection facilities, producer compliance schemes, authorised treatment facilities and exporters.

Details of the regulations can be found on the [**UK Legislation website**](http://www.legislation.gov.uk/uksi/2013/3113/contents/made).

Government Guidance can be found on the [**UK Government website**](https://www.gov.uk/government/publications/weee-regulations-2013-government-guidance-notes).

**Waste Electrical and Electronic Equipment Directive (2002/96/EC)**

The [**Waste Electrical and Electronic Equipment Directive**](http://europa.eu/legislation_summaries/environment/waste_management/l21210_en.htm) (external link) aims to promote re-use, recycling and recovery of WEEE. It does this by encouraging producers and manufacturers of EEE to set up collection systems and take-back schemes. So the amount of WEEE sent to landfill is reduced.

The Directive seeks to improve the environmental performance of producers by encouraging them to design products that can be easily repaired, dismantled and recovered, re-used and recycled. It also requires that new EEE is labelled with the crossed-out wheeled bin symbol to inform users of EEE not to dispose of WEEE to landfill.

Some of the main requirements of the WEEE Directive include:

* to set up systems to encourage separate collection of WEEE and allow the return of WEEE free of charge to the final holder
* retailers to ensure that WEEE is taken back on a one to one basis when a new, equivalent type product is supplied
* manufactures are encouraged to design and produce products that can easily be re-used, recovered and recycled
* reduce the amount of WEEE going to landfill
* European Union Member States must achieve a collection rate of at least 4 kilograms of WEEE on average per inhabitant per year.

In December 2008, the Commission published proposals for updating the WEEE Directive. In April 2009, the UK held a public consultation on the Commission proposals. This was a joint consultation on the WEEE Directive and the restriction of the use of certain Hazardous Substances in electrical and electronic equipment (ROHS) Directive. The responses to the consultation were used to inform the UK negotiations.

After negotiations, a final Directive was agreed and published on 24 July 2012. We held a [**joint consultation**](http://gov.wales/consultations/environmentandcountryside/waste-electrical-and-electronic-equipment-recast-directive/?status=closed&lang=en) on the updates to the WEEE Directive between 17 April 2013 and 21 June.

BIS is the lead UK Government Department for the implementation of the Waste Electrical and Electronic Equipment (WEEE) Directive.

**Legislation**

The WEEE Directive is implemented in the UK by the [**Waste Electrical and Electronic Equipment (WEEE) Regulations 2006**](http://www.legislation.gov.uk/uksi/2006/3289/contents/made) (external link) (as amended). The Regulations place responsibilities and obligations on businesses that manufacture, import, rebrand, distribute, generate, refurbish or treat WEEE.

The obligations placed on producers are enforced, in England and Wales, by the Environment Agency and Natural Resources Wales. The obligations on distributors are enforced by the Vehicle Certification Agency (VCA).

The Regulations also aim to ensure that businesses that sell or distribute EEE provide household customers with written information on:

* the environmental impacts of the products they have purchased
* how to dispose of them in a safe and environmentally sound manner.

Visit: [**BIS Government Guidance Notes on Waste Electrical and Electronic Equipment**](http://www.bis.gov.uk/files/file54145.pdf) (external link)

For more information on WEEE and how this may affect to your business please see the [**Business Wales website**](http://business.wales.gov.uk/bdotg/action/layer?site=230&topicId=1082900279)  (external link).

**Environment Agency – Waste Electrical and Electronic Equipment (WEEE)**

This site has information on:

* the WEEE Directive
* advice for businesses
* responsibilities and obligations under the WEEE Regulations for producers, importers and retailers.

Visit: [**Environment Agency – Waste Electrical and Electronic Equipment**](http://www.environment-agency.gov.uk/business/topics/waste/32084.aspx) (external link)

**WEEE consumers Information**

This site has information for consumers on:

* recycling electrical items
* why it is important to recycle
* what can be recycled
* retailer ‘take-back’ schemes for small electrical items.

Visit: [**WEEE consumers information**](http://www.recyclenow.com/why_recycling_matters/electricals/) (external link)

**European Commission – WEEE**

This site has information from the European Commission on the WEEE Directive and other legislation.

Visit: [**European Commission – WEEE**](http://ec.europa.eu/environment/waste/weee/legis_en.htm) (external link)

**Vehicle Certification Agency (VCA) Distributor Enforcement**

This site has information for businesses. It is directed at those who have responsibility for ensuring that retailers and distributors of electrical equipment help UK households dispose of electrical and electronic items when they reach the end of their life.

Visit: [**Vehicle Certification Agency (VCA) Distributor Enforcement**](http://www.dft.gov.uk/vca/enforcement/weee-enforcement.asp) (external link)

**Distributor Takeback Scheme**

This site has information for businesses about the [**Distributor Takeback Scheme**](http://dts.valpak.co.uk/dts/) (external link). Through this scheme, they can make a financial contribution, which can help develop WEEE collection facilities.

<http://www.theguardian.com/sustainable-business/india-it-electronic-waste>

India's e-waste burden

The country's IT prowess attracts global business, but it also generates huge amounts of electronic waste often scavenged by children in dangerous conditions



Brigade Road, Bangalore. The city produces around 20,000 tonnes of e-waste per year and the figure's rising. Photograph: 19697.000000/Getty Images

[**Leah Borromeo**](http://www.theguardian.com/profile/leah-borromeo)

Friday 11 October 2013 12.44 BSTLast modified on Thursday 22 May 201407.01 BST

The Indian city of Bangalore produces some [20,000 tonnes of e-waste per year](http://www.thehindu.com/news/cities/bangalore/ewaste-capital-are-we/article5109292.ece), according to [a report](http://www.assocham.org/publications/genpub.php) by Assocham, the Association of Chamber of Commerce and Industry of India. This figure is rising at a rate of 20% per year and the report's authors forecast the amount of computer waste across the country could increase by nearly 500% by 2020.

With a population of 8 million people, Bangalore has [emerged as a global telecommuncations and technology hub](http://www.bbc.co.uk/news/technology-23931499) shouldering 40% of India's IT industry. Since the economic liberalisation of the 1990s, major international firms such as Infosys, Intel and Microsoft have opened bases there along with nearly 3,000 software firms, 35 hardware manufacturers and hundreds of other small scale businesses – turning this once lush farmland into India's Silicon Valley.

More than 500 Bangalore-based companies generate an annual revenue of over $17bn (£10.5bn) – a healthy portion of India's $85bn total tech-based export that started life as outsourcing and backoffice centres. Have you ever phoned your mobile phone company and been put through someone in [India](http://www.theguardian.com/world/india)? They may well have been in Bangalore.

The Karnataka State Pollution Control Board (KSPCB) set up a formal recycling system for e-waste to deal with Bangalore's growing tech dump. But awareness of the e-waste management and handling rules is poor.

Up to 90% of this waste is still handled [through the informal sector](http://www.deccanherald.com/content/358639/ctrlaltdel-e-waste.html) – by firms who employ low-paid workers to process and incinerate e-waste. The people who do this are unaware of safety measures needed for the work. They release lead, mercury and other toxins into the air and use acids to extract precious metals from hardware. What can't be got out is unceremoniously dumped – letting pollutants seep into groundwater.

[Hal Watts](http://www.halwatts.co.uk/Esource), a designer who trained at the Royal College of Art's sustainability wing, SustainRCA, has devised a bicycle-powered machine that separates valuable copper from electronics. Copper is used in all circuit boards and within most wires. Its ubiquity is what makes it a valuable commodity for people who scavenge through piles of e-waste and sell the copper on.

"All recycling technologies have been designed with large western recycling plants in mind," says Watts. "There is almost no equipment that is affordable enough for the informal recycling sector because no single recycler deals with enough waste to afford these large machines.

"The informal recycler breaks up waste, sells the copper to one guy, the plastic to another, the circuit boards to another etc. These guys amass their material and sell it to an exporter who then flogs it to a recycling plant often located in a developed country."

Countries such as [Singapore, Belgium and Japan](http://articles.timesofindia.indiatimes.com/2013-09-17/bangalore/42147944_1_e-waste-management-precious-metals-processing-unit) have smelting units that extract precious metals the human eye can't see.

Further up the recycling chain are startups like [Karma Recycling](http://www.karmarecycling.in/about.php). Based in New Delhi with a nationwide expansion plan to open a hub in Bangalore, Karma targets end users and consumers.

Most Indians have access to basic technologies like mobile telephones, televisions and radios. A rapidly expanding middle class also has access to personal computers and other comforts. If you can't sell your old gadget on to someone else, Karma provides a system where you can get an online quote for it. They buy it from you, refurbish or dismantle it and then sell those components on. They also have logistics solutions to handle larger hauls of rejected or broken electronics.

"Electronic waste is one of the fastest growing waste streams in the world," says Akshat Ghiya, Karma Recycling's co-founder. "If it's not recycled scientifically, it leads to a waste of diminishing natural resources, causes irreparable damage to the environment and to the health of the people working in the industry.

"Companies design new and improved gadgets every day, flooding the markets month after month, year after year. What happens with these devices when we're done with them? It is time for us as a society to realise that what has gone around (and has been used), must come around (and be reused)."

There is legislation that governs the disposal of used and defunct electronics, requring e-waste to be collected, transported and safely disposed. Sale of some electronic scrap to un-authorised or unlicensed dealers and vendors, large or small-scale, is illegal. But that doesn't stop the murkier side of the industry from operating.

The informal recycling industry often [employs children](http://www.theepochtimes.com/n3/275489-thousands-of-child-laborers-dismantle-e-waste-in-indias-capital/) to dismantle electronic waste. Assocham's report strongly advocates legislation to prevent a child's entry into this labour market. The report also reveals that less than 5% of India's e-waste is recycled.

Consumerism works much the same around the world – something new and shiny comes out and those that can afford it try to get it.

"Objects are not currently designed to be recycled," says Watts. "A change in design practices won't occur without stricter legislation or until materials become so expensive that there is real interest from companies to design with recycling in mind."

When it comes to the reduction of e-waste, the onus is on both the consumer and the producer. In Bangalore, and elsewhere, individuals and companies have to see the fiscal benefits in upgrading without disposing what they had before. The secret life of machines is one where they are always reincarnated.