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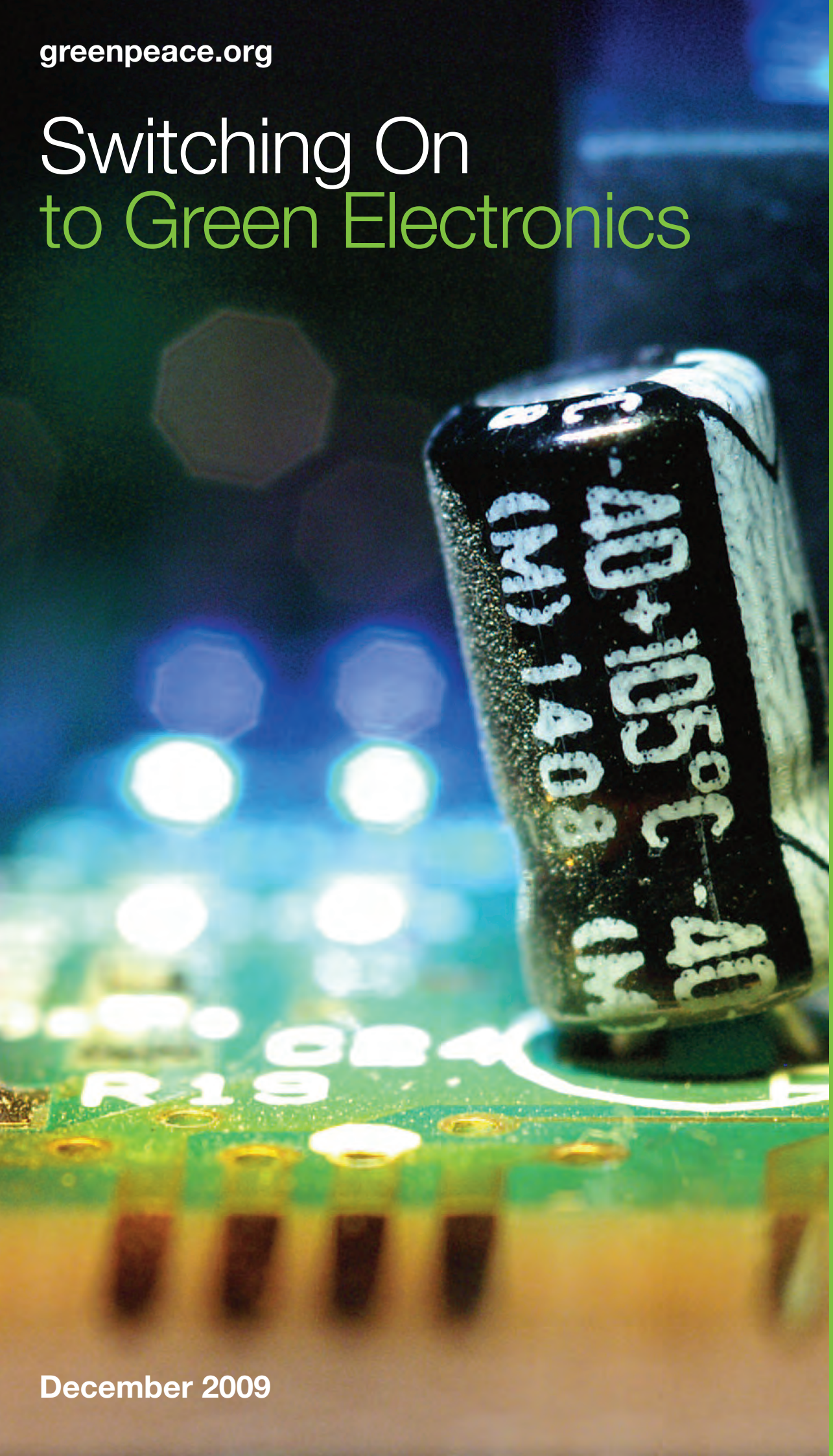
Switching On to Green Electronics



December 2009

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International

image A Toshiba Circuit Board is dismantled to enable the testing of individual components and materials for a range of hazardous substances including heavy metals, brominated flame retardants and PVC plastic. This is part of a Greenpeace study 'Toxic Chemicals in Computers Exposed' to reveal the presence of toxic substances in well-known brand laptops.

Contents

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Switching on to green electronics

Electronic devices are a complex mixture of several hundred materials, many of which can contain hazardous chemicals such as heavy metals – highly toxic compounds of lead, mercury or cadmium– hexavalent chromium, beryllium, brominated flame retardants (BFRs) or the chlorinated plastic, polyvinyl chloride (PVC).

Recycling of electronics devices is one way of reducing environmental hazards associated with early production stages. However, recycling in this case is not the whole solution; because of hazardous chemicals currently being used in the manufacture of electronics products, recycling can bring its own problems.

If not reused either as whole equipment or components, obsolete e-products are being treated to reclaim metals and, sometimes, to recycle the plastics. Even with the best available technologies in western countries, recovering metals can be polluting, with potential exposure to metal fumes for workers and residents of recycling areas, and the formation of dioxins from smelting PVC-coated cables or BFR-treated plastics. This clearly shows how the choices made during the design of products determine the safety of waste management.

Greenpeace has been pushing the major electronics makers to:

- Embrace the principle of "Individual Producer Responsibility" by taking financial responsibility for their products at the end of life.
- Design out toxics – clean up their products by eliminating hazardous substances, replacing harmful ingredients through use of safer alternatives or design changes. The solution to the e-waste crisis lies primarily in product design.
- Reduce the climate impact of electronics products and provide technology solutions to help significantly reduce global greenhouse gas emissions.

Global sales of mobile phones, computers, TVs and game consoles continue to grow rapidly. In 2008, 1.22 billion phones[1] and 302 million computers were sold. The games console market is the fastest growing area of consumer electronics, with 409.9 million units sold in 2008[2].

Beyond consumer electronics, the growth of IT datacentres to power IT infracstructure and the internet resulted in IT being responsible for 2% of global CO_2 emissions in 2007[3], which is predicted to grow significantly by 2020.

In *'Switching On to Green Electronics'*, we show the problems caused by toxic chemicals in, and the climate impacts of, electronic products – at all stages of their lifecycle, from production, through manufacture and to the very end of a product's life – as well as the solutions that can stop the e-waste crisis. We also show how industry is beginning to move forward, pulling the plug on dirty electronics, and how Greenpeace is influencing the electronics industry to take responsible steps to design out toxics and champion climate change solutions. Finally, we show what you can do: the steps you can take towards helping the world switch on to truly green electronics.

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image Guiyu, China – workers receive a truckload of electronic waste, including old laptops, keyboards, terminals and desktop computers.

The solution to the e-waste crisis lies primarily in product design. Greenpeace has been pushing the major electronics makers to clean up their products by eliminating hazardous substances - replacing harmful ingredients through use of safer alternatives, or through making design changes.

image Longgang, China – a worker sorts through a pile of e-waste. Much of modern electronic equipment contains toxic ingredients. Vast amounts are routinely and often illegally shipped as waste from Europe, the US and Japan to countries in Asia as it is easier and cheaper to dump the problem on poorer countries with lower environmental standards.

The toxic lifecycle of electronic products

What we recognise as branded products are just the visible links in a whole chain of industrial operations scattered across all continents of the globe, in constant search for material resources and labour forces at the lowest cost possible – often meaning at the lowest social and environmental standards.

Throughout the entire lifecycle of electronic devices, these dangerous substances can cause serious environmental pollution and put workers at risk of exposure when the products are produced or disposed of.

The first step in producing electronic devices is the extraction of raw materials through mining and processing ores.

Manufacturing locations, historically based in the Western world, have been shifting to reflect more and more the quest for cheap labour: maquiladoras in Mexico and other Latin American countries, sweatshops in South-East Asia, India and China, but also low-waged qualified workers in Central and Eastern Europe. In many locations where cheap labour is available it comes hand-in-hand with poor environmental standards, leading to environmental contamination due to the use of hazardous chemicals in the production process.

At the end of a product's life the problems still remain. While state-of-the-art waste facilities (smelters, recycling, landfills, incinerators) can be found in OECD (Organisation for Economic Cooperation and Development) countries, a worldwide waste trade, often illicit, feeds Asian countries, primarily China and India, practising rudimentary recycling, or African countries such as Nigeria and Ghana where lots of waste is simply dumped.

A dangerous, new waste stream is rapidly emerging. The UN estimates that some 20 to 50 million tonnes of e-waste are generated annually worldwide[4]. Hundreds of thousands of old computers and mobile phones are dumped in landfills, incinerated or processed in smelters. Thousands more are exported, often illegally - from the European Union, the United States, Japan and other industrialised countries – to Asia and Africa. There, workers at scrap yards – some of whom are children – are exposed to a cocktail of toxic chemicals and poisons when the products are broken apart.

Given the rudimentary conditions of recycling that prevail in Asia and Africa, the problem of hazardous ingredients in electronics is exacerbated by the poor working conditions in the scrapyards, affecting the environment and health of thousands of people working there. A recent study simulating the type of primitive recycling operations prevalent found alarming levels of chlorinated and brominated dioxins in air emissions and ash during the burning of PVC cables and circuit boards containing BFRs[5]. Such informal ways of recycling in China have been shown to cause severe environmental contamination with BFRs as well as chlorinated and brominated dioxins, including the highest documented values of chlorinated dioxins found in ambient air in the world[6]. Evidence indicates this is leading to increased body burdens of chlorinated dioxins for residents of recycling areas[7].

From electronics companies' own statistics[8] it seems that responsible recycling is undertaken only for a small amount of branded PCs (less than 40%) and an even lower percentage of branded mobile phones (less than 9%), meaning that 60% or more of branded PCs and around 91% of branded mobile phones escape from any kind of producer's responsibility. While some might be accounted for by attic or garage storage, much might be disposed of with mixed waste in landfills and incinerators if not exported for rudimentary recovery by Asian informal recyclers or for dumping in Africa.

The rate at which these mountains of obsolete electronic products are growing will reach crisis proportions unless electronic corporations that profit from making and selling these devices face up to their responsibilities.

This unacceptable situation reflects both the lack of brand responsibility laws allowing e-waste to escape a more sophisticated management and the lack of brand consideration for green design, shifting a toxic burden of chlorinated, brominated and other hazardous substances on downstream recyclers.

image Nanyang, China - workers dismantle a pile of electronic circuits.

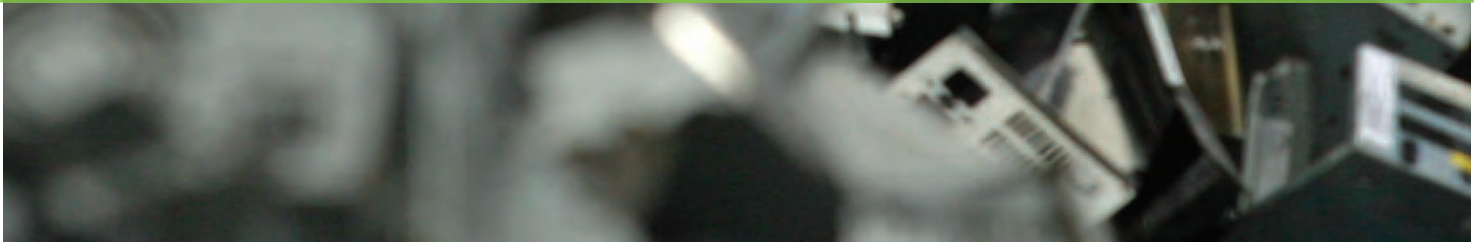


image Boys burning electronic cables and other electrical components in order to melt off the plastic and reclaim the copper wiring. This burning in small fires releases toxic chemicals into the environment. The majority of second-hand electrical goods that are imported to Ghana from developed countries are beyond repair and are either dumped or "recycled" in this crude fashion.

E-waste – 'not in my backyard'

The UN estimates that some 20 to 50m tonnes of e-waste are generated worldwide each year, comprising more than 5% of all municipal solid waste. The quantities of e-waste generated are predicted to grow substantially in the future both in industrialised countries and in developing countries, which are expected to triple their output of e-waste by 2010[9].

Not in the EU backyard

The United Nations University's latest estimate of current waste electrical and electronic equipment arising across the EU Member States is between 8.3 and 9.1m tonnes for 2005, while the estimated amount currently collected and treated is allegedly some 25% of that, leaving a 'hidden flow' of 75% remaining to an unknown fate.

The total amount of e-waste arising in the EU is predicted to grow annually between 2.5% and 2.7%, reaching about 12.3m tonnes by 2020[10]. While producers in the EU have been made responsible for dealing with e-waste under new regulations, and e-waste exports fall under shipment regulation banning its export to non-OECD countries, evidence shows that such export is still happening – by either illegal means (trafficking), through regulatory loopholes or under the pretext of reuse and charity donations to developing countries.

Not in the US backyard

The situation in the US is quite different. Despite certain US States implementing their own e-waste equipment initiatives and some of the major companies beginning to take producer responsibility by setting up voluntary take-back and recycling schemes, e-waste remains unregulated at the federal level, exports of e-waste to non-OECD countries are legal and national levels of collection are far too low to make an impact.

According to the US Environmental Protection Agency (EPA)[11], 18% of PCs, laptops and monitors reaching end-of-life in 2007 were collected for recovery, along with 18% of TVs and 10% of mobile phones. But without sound regulations and even a comprehensive data assessment, these figures are likely to be optimistic as the EPA's definition of recovery includes exports of e-waste to developing countries, which is unacceptable. All in all, the hidden flow of e-waste escaping responsible recycling in the US may be as much as 80% or more.

Somebody else's backyard

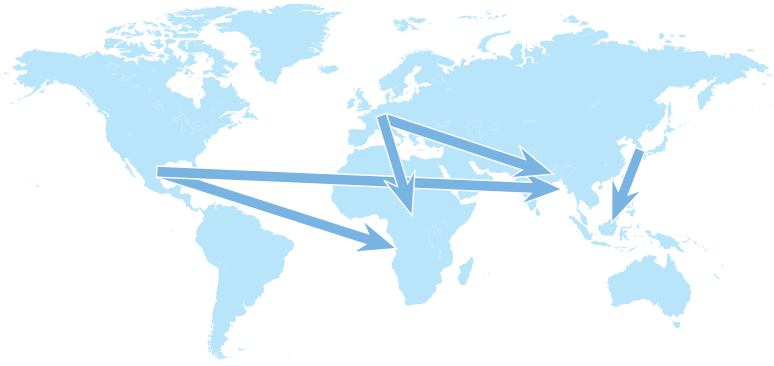
For non-OECD countries such as China and India with large informal recycling sectors, it is simply not possible to even estimate the percentage of the hidden flow of e-waste. In these rapidly industrialising countries the demand for the recovery of valuable raw materials, as well as cheap labour, feeds the import of e-waste from developed countries, which adds to the growing domestic e-waste problem. In India, 99% of domestic and imported e-waste is estimated to end up in the informal recycling sector[12], with a high toll on health, safety and the environment and a rather poor rate of material recovery. Other regions are also under threat of illegal imports of e-waste, such as African countries where donations for refurbishment and reuse are simply a pretext for the dumping of non-repairable devices.

Uncovering the hidden flows

Greenpeace investigations revealed e-waste being illegally exported to Pakistan and Ghana for crude recycling and dumping. In February 2009, Greenpeace revealed the results of an in-depth investigation that revealed a broken TV delivered to Hampshire County Council in the UK was tracked being exported illegally to Nigeria[13]. This is just one example of the illicit trade in e-waste that is happening in many parts of the world.

Hidden flows

- From the US to Africa/Asia: no laws, legal export
- From the EU to Africa: illegal export or under cover of reuse/donation
- From the EU to Asia: illegal export or under cover of recycling
- From Japan to South-East Asia: export under trade agreements



© GREENPEACE / PRAKASH HATVALNE

© ROBERT KNOTH / GREENPEACE

image In the Karachi district of Lyari, hundreds of workers, including teenage children, earn their livelihoods by dismantling electronic scrap and extracting valuable components such as copper to sell. This is an insight into the personal cost of e-waste. Thousands of tons of e-waste such as discarded PCs, mobile phones and TVs, are dumped in Africa and Asia every year. Greenpeace research shows that some of this waste is exported from Europe to Pakistan.

It is possible to make clean, durable products that can be upgraded, recycled or disposed of safely and do not end up as hazardous waste in somebody else's backyard.

image Nanyang, China – workers bake circuit boards from e-waste in a workshop. Workers and communities involved in dismantling e-waste are exposed to serious environmental problems and health hazard. Greenpeace is strongly urging major manufacturers to exclude toxic materials from their products.

Hazardous chemicals in electronic products

- Lead can be found in solders, although decreasingly, in the glass of cathode ray tube (CRT) monitors and as a stabiliser in PVC. Lead is highly toxic and exposure to lead can result in irreversible damage to the nervous system, particularly in children[14], which can lead to intellectual impairment.
- Mercury, used in lighting devices for most flat screen displays, can damage the brain and central nervous system, particularly during early development[15].
- Cadmium, used in rechargeable computer batteries, contacts and switches and in older CRTs, can accumulate in the body over time and is highly toxic, primarily affecting the kidneys and bones. Cadmium and its compounds are also known human carcinogens[16].
- Beryllium, used as a metal alloy in electrical contacts and as beryllium oxide in the semi-conductor industry, is a human carcinogen and inhalation of fumes and dusts can cause lung disease[17].
- Compounds of hexavalent chromium, used in the production of metal housings, are highly toxic and are human carcinogens[18].
- Some BFRs[19] used in circuit boards and plastic casings do not break down easily and can build up in the environment, and some BFRs are also highly bio-accumulative (build up in the body). Long-term exposure to certain polybrominated diphyenylethers (PBDEs) has been linked to abnormal brain development in animals, with possible impacts on learning, memory and behaviour. Some BFRs can also interfere with thyroid and oestrogen hormone systems and exposure in the womb has been linked to behavioural problems[20]. Incineration or any kind of burning of plastics containing BFRs can cause the release of persistent dioxins and furans[21].
- PVC is a chlorinated plastic used in some electronics products, including for insulation on wires and cables[22]. Although not directly toxic, PVC is a major source of pollution and chemical hazard at all stages of its life cycle. In its softened form (as found in cables), PVC requires the use of additives such as hazardous phthalates, including di(2-ethylhexyl) phthalate (DEHP) and di-n-butyl phthalate (DBP), which are known as reproductive toxins[23]. Incineration or any kind of burning of PVC can cause the release of persistent and toxic chlorinated dioxins and furans[24].

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The world's booming consumption of electronic and electrical goods has created a corresponding explosion in electronic scrap, much containing toxic and persistent chemicals.

image Mandoli, India – after being treated with hydrochloric acid to remove valuable copper, worthless acid-contaminated plastic circuit boards are dumped in a river.

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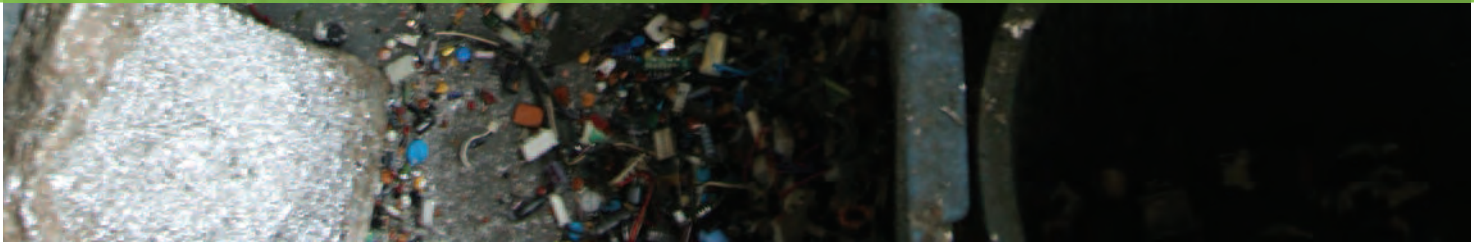

image The motherboard of a Microsoft XBox 360. The Xbox 360, Sony Playstation 3 and Nintendo Wii were tested in an independent laboratory for hazardous and toxic components. Tests on all three consoles proved positive for a number of hazardous chemicals and materials.

Legislation needed to green the industry

The polluter pays

"Extended Producer Responsibility" means that the cost of waste management is incorporated into the product price, thereby enacting the 'polluter pays' principle. Producers either absorb the additional costs (evaluated at 0.1% of the price of a PC and 0.01% of a mobile phone), or increase the product price to take account of these costs. In a competitive market this will motivate producers to design more environmentally friendly products in order to lower the end-of-life costs. To be effective, such a programme should be aligned as close as possible to "Individual Producer Responsibility", meaning that each company pays for its own-branded discarded products.

Laws such as the EU Restriction of the use of certain Hazardous Substances (*RoHS*) Directive have proved useful but only tackle part of the problem. Extended Producer Responsibility and Individual Producer Responsibility programmes give additional incentives to companies to implement precautionary action, by designing out toxics above and beyond that which is currently required by law.

Substitution of hazardous substances is already happening and should be taken forward by the industry as a whole, while PVC and BFRs should also be restricted by RoHS and other equivalent laws worldwide.

Legal solutions in the EU

In the EU, from July 2006, six substances[25] are banned or restricted in products under the RoHS Directive. Greenpeace advocates RoHS should also cover, as a matter of urgency, PVC and all BFRs as well as other hazardous substances, including phthalates, beryllium and antimony. It is crucial that progressive companies push for stronger legislation in the upcoming revision of the RoHS Directive.

The EU Waste Electrical and Electronic Equipment (WEEE) Directive makes producers individually and financially responsible, as of August 2005, for taking their e-waste back when their products are discarded. The WEEE Directive has been poorly implemented by half of the EU Member States – in this current state, it will not deliver the expected benefits in terms of design incentives. Positive business leaders are committed to change this situation (see www.IPRworks.org).

Legal solutions in the US

In the US, NGOs - including the Basel Action Network, the Computer Take Back Campaign and the Silicon Valley Toxics Coalition - and progressive companies are working to get good individual producer responsibility legislation at federal level. So far, 19 states have passed policies to this effect. In 2008, because of Greenpeace pressure, the US lobby group ARF Coalition (Advanced Recycling Fee), dedicated to shifting the financial burden for dealing with e-waste onto consumers, was dismantled.

Legal solutions in emerging economies

"Same products, same players, same responsibilities," is our philosophy. Although China has restricted hazardous substances in some electronic products and China, Thailand and India all have EU-type laws pending, they are the exceptions in the developing world. Developing an EPR legislative package tailored to the specificities of national situations is, for many reasons, not an easy task for developing countries. However, Greenpeace believes that the first steps can already be taken by governments in the form of RoHS-type legislation, bans on the import of e-waste (with the additional ban of export in OECD countries) and stricter controls on import for reuse.[26]

image A laptop is dismantled to enable testing of individual components and materials for a range of hazardous substances, including heavy metals, BFRs and PVC.

In 2007, Greenpeace's testing of 18 laptops found that for almost every type of component tested there were examples that were free of PVC and BFRs, indicating the potential for production of an entire laptop free from these harmful ingredients.

image The cables of a server. The IT industy's own GHG emissions are set to increase, but this is because it is producing technology that will reduce GHG emissions across the economy.

Climate change and the IT industry

The climate change impact of the IT industry on emissions is being recognised more widely and starting to be addressed. What is less well known is that IT has the potential to be a big part of the solution to climate change. The industry's carbon footprint is currently growing, and much green IT potential remains unrealised, or lacks detailed studies showing how or where overall emissions can be reduced.

We are pressuring the biggest names in the IT industry to move quickly to produce climate solutions and reduce their own emissions. The IT sector creates 2% of global greenhouse gas emissions, but IT services and products have the potential to cut the world's emissions when applied in industry, buildings, transport and power sectors.

The IT industry can and should be at the vanguard of climate solutions. We have all seen how tech companies compete with each other to provide the newest, fastest, and shiniest gizmos to power our lives. It is only natural that they now apply that knowhow and compete with each other to see who can provide the best (and profit the most from) IT climate solutions.

Many IT companies, including HP, Nokia, Microsoft, Sun, Cisco and Ericsson, Google, Dell, IBM and Lenovo have already said that they are able to provide IT solutions that will reduce projected global greenhouse gas emissions by 15% by 2020. That's a big portion of the 40% reductions needed in industrialised countries by 2020. Because Greenpeace wants to take IT's potential to drive transformational change and make it reality, we have launched our Cool IT Challenge, an effort to expose the IT industry's inadequate leadership in tackling climate change and challenge them to do better.

Greenpeace began its Cool IT Challenge in February 2009 with a letter to the CEOs of the major IT companies asking them to take specific action prioritising climate change in 2009. We then scored the companies according to their responses to specific requests in that letter, which urged them to show leadership by:

- Providing IT solutions and accurately measuring the impacts these solutions provide for the rest of the economy. These solutions come in vital areas in such as grid transmission, transport, and building efficiency;
- Lobbying for a strong international and national climate legislation. Strong legislation will create a stimulus for an increase in demand for IT driven climate solutions by the rest of the economy;
- Reducing their own emissions and increasing their use of renewable energy.

The Cool IT Challenge is updated periodically to show which of the world's biggest tech companies are leading the way on tackling the most urgent climate priorities. Decisive action is needed now from global IT giants to help lead the way in the clean tech revolution that's needed to tackle climate change.

Check greenpeace.org/coolit for the latest results online and how you can get involved.

image Greenpeace is calling on IT company leaders to become climate leaders too.

The IT sector creates 2% of global greenhouse gas emissions, but IT services and products have the potential to cut the world's emissions by 15% by 2020, when applied in industry, buildings, transport and power sectors.

Driving change: what Greenpeace is doing

Greenpeace believes that manufacturers of electronic goods should take responsibility for the entire life-cycle of their products; from production, through manufacture and to the very end of the products' lives. Since the start of our campaign in 2005, many of the leading companies have improved their environmental policies and practice.

We are witnessing a massive improvement in the policies and practices of the major brands, and the race between companies for the greenest credentials is heating up. It is clear that companies will be coming under increased scrutiny about their environmental standards during the next few years as businesses and consumers aim to purchase the most environmentally-sound electronic equipment.

A key indicator of companies taking decisive action is the elimination of hazardous PVC and BFRs from their products. Nokia and Sony Ericsson have removed these hazardous chemicals from their mobile phones, and in October 2009 Apple became the first PC manufacturer to release products completely free of these hazardous chemicals substances. Now, the onus is on other PC manufacturers - such as Hewlett-Packard, Dell, Acer and Lenovo - to follow Apple's lead.

Green statements run the risk of companies taking only the easiest ways of green marketing, limiting the scope of initiatives or taking actions neither focussed on the whole production and supply chain nor greening the core activities of their business. The time for green statements without substance has passed. The industry needs to gain a better understanding of the full lifecycle of its products and innovate to reduce environmental impact. Decisive action is needed from companies now, both on developing more sustainable business practices, and in taking real concrete steps in improving product design – substitution of toxic chemicals, and increased energy efficiency being introduced at the design stages - and responsible recycling practices need to be undertaken.

That is why, alongside direct actions to highlight that companies need to go green, Greenpeace has developed different campaign tools showing them how to go green, illustrating the relevant steps that need to be taken. The Greenpeace Guide to Greener Electronics and the Cool IT Challenge are highlighting what companies need to change, and which companies are ahead in the race towards a more sustainable industry.

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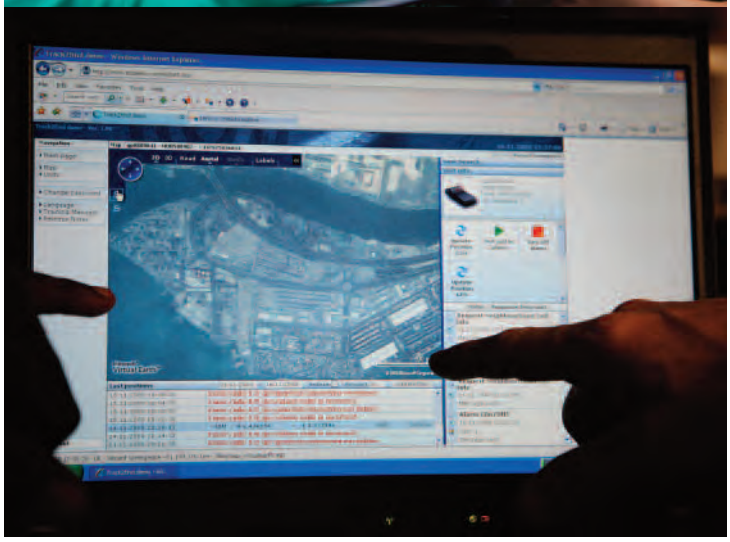


© GREENPEACE / KRISTIAN BUUS

image top A HP (Hewlett-Packard) representative attempts to take a HP laptop bearing the message HP: Harmful Products on the screen and held by a Greenpeace activist wearing a mask to mimic the Hewlett-Packard Chief Executive Officer Mark Hurd outside the Hewlett-Packard (HP) China headquarters in Beijing.

Greenpeace demanded that the company took back the toxic laptops and started making "greener" products.

image bottom The position of a Philips television which contains a tracking device is displayed on a computer screen. Greenpeace gave the television to engineers who dismantled it and discreetly installed the tracking device within the casing. The tracking equipment is a state-of-the-art system that operates on GPS, GSM and radio frequency. The device gives regular updates of position, and was used to track the broken TV from the UK to Africa.

Greenpeace Guide to Greener Electronics

Since August 2006, Greenpeace has been producing the 'Greenpeace Guide to Greener Electronics', which is updated on a quarterly basis. The Guide ranks 18 leading manufacturers of mobile phones, PCs, TVs and game consoles on their policies and practices on eliminating hazardous chemicals, taking responsibility for their products once they are discarded, and reducing the climate impact of their products and operations.

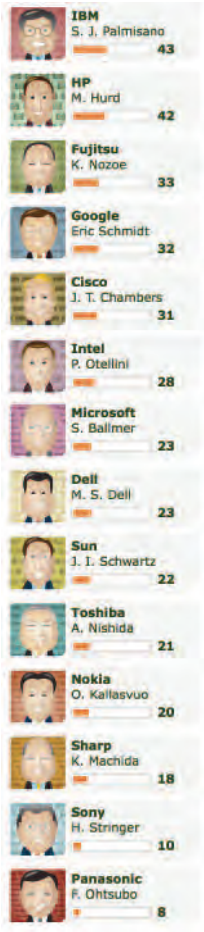
The Guide aims at providing a useful tool for consumers willing to purchase greener products and support positive business while creating transparent competition between major brands to become green leaders.

Over more than three years, the Guide has led many companies to embrace and promote Individual Producer Responsibility, start substituting the worst chemicals (starting with PVC and all BFRs), to commit to global take-back of discarded products and improve their climate policies and practice. The Guide also works to prevent corporate double standards, anti-environmental lobbying and other irresponsible practices.

Fuller details of specific companies' performance, and each edition of the Greenpeace Guide to Greener Electronics, can be found at our website: www.greenpeace.org/rankingguide

Apple: from laggard to leader

In the first editions of the Guide to Greener Electronics, Apple was close to the bottom, due to its lack of commitment to phase out hazardous chemicals and to introduce a global recycling policy. In response, Greenpeace launched the award-winning online GreenMyApple campaign, calling on Apple's loyal fans to say 'I love my Apple, I just wish it came in green'. Thousands of Apple fans responded, leading Apple CEO Steve Jobs to announce a policy change in May 2007. Now, Apple is leading the way: as the first computer manufacturer to complete the phase-out of BFRs and PVC, and with one of the highest recycling rates. Now it's up to its competitors, including HP, Dell, Acer and Lenovo, to follow Apple's lead on toxics elimination.



Cool IT Challenge

Currently, the IT industry's carbon footprint is growing, and much green IT potential remains unrealised, or lacks detailed studies showing how or where overall emissions can be reduced.

Decisive action is needed now from global IT giants to help lead the way in the clean tech revolution that's needed to tackle climate change.

We are pressuring the biggest names in the IT industry to move quickly to produce climate solutions and reduce their own emissions. Check www.greenpeace.org/coolit for the latest results online, and for how you can get involved.

Greenpeace launched its Toxic Tech Campaign in 2005, to pressure the world's top PC and mobile phone manufacturers to eliminate toxic chemicals, starting with polyvinyl chloride (PVC) and brominated flame retardants (BFRs) from consumer products, take responsibility for the entire life-cycle of its products including paying for recycling, and champion climate change solutions. The following are the main achievements of the campaign to date.

2006

March - Electronics giant Hewlett Packard commits to produce a phase-out plan for a range of hazardous chemicals in its products.

June - Dell announces 2009 deadline to eliminate PVC and BFRs from all its products.

August - The first Guide to Greener Electronics is launched and proves an instant hit with a public eager to learn about companies' environmental polices.

September – Greenpeace finds a type of BFR in HP laptops after the company stated this chemical had been eliminated; a subsequent penalty point drops HP's score on the Guide to Greener Electronics

September - Greenpeace launches the GreenMyApple campaign website, which receives over 100,000 visitors in the first 3 days.

December - Lenovo and Acer commit to eliminate PVC and BFRs by the end of 2009. Greenpeace 'greens' Apple New York City Store as the company refuses to commitment to a phase out of dangerous chemicals in product lines.

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2004

Samsung is the first company to commit to eliminate PVC and BFRs in all consumer electronics products but without a specific timeline.

2005

Greenpeace launches the Toxic Tech Campaign calling on real environmental leadership from the electronics industry.

Nokia releases the first PVC and BFR free mobile phone.

2007

January - Michael Dell announces Dell's free global recycling scheme at 2007 Consumer Electronics Show and challenges the rest of the industry to match it.

May - Victory: As a result of thousands of Apple fans calling for a Greener Apple, Steve Jobs responds with a personal letter that announces an end-2008 deadline to remove PVC and BFR from all new products.

June - HP commits to eliminate PVC and BFRs in computer equipment only.

July - Greenpeace study exposes alarming toxic contamination in Guiyu, China due to the disposal of electronic waste.

November – Nintendo becomes the first company to receive zero points on the Guide to Greener Electronics and Greenpeace launches 'Clash of the Consoles' for gamers to encourage their favorite companies to become champions in the elimination of toxic chemicals

2008

February - Greenpeace releases the report Toxic Tech: Not in My Backyard, which exposes a highly dangerous and often illegal e-waste trail from rich countries to dumping in developing countries

June - Greenpeace raises the bar on the criteria for the Guide to Greener Electronics, adding climate change criteria, additional elimination of toxic chemicals and global take-back standards.

August – Greenpeace pressure helps to dismantle the Electronic Manufacturers' Coalition for Responsible Recycling (EMCRR), a US coalition of electronics companies lobbying against producer responsibility for the e-waste generated by their own products.

October - Greenpeace calls on Philips to 'Simply Take Back and Recycle' during a demonstration in Moscow's Red Square, shaming Philips' regressive policy in Europe of lobbying for customers to pay for the recycling of e-waste generated by Philips' products.

October - Apple clears the last hurdle in removing toxic PVC plastic in its new Macbook and iMac, capping the GreenMyApple campaign with a win and making Apple products safer, easier to recycle and causing less pollution at the end of their life.

November - The CEOs of Ericsson and Dell call for a strong deal on climate change at the UN Climate Summit in Copenhagen.

2010

January - Greenpeace launches the 14th edition of the Guide to Greener Electronics.

image 1 image 1 2005 – The beginning of the Toxic Tech campaign, and Greenpeace delivers a truckload of toxic electronic waste to the offices of Hewlett Packard in Guadalajara, Mexico.

image 2 2006 – Greenpeace runs a high-profile 'GreenMyApple' stall at the MacExpo in London, calling on Mac fans to challenge Apple to go green.

image 3 2006 – Greenpeace activists gather at the 5th Avenue Apple store in Manhattan, shining a 'green' light on the emerging problem of e-waste.

image 4 2007 – Because electronic products are made using toxic ingredients, workers – some of whom are children - at yards such as this one in Guiyu, China, risk exposure when they break the products apart by hand, under appalling conditions.

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2009

January – Greenpeace launches the 'Greener Electronics: The Search Continues' product survey at CES 2009, evaluating products submitted by companies to Greenpeace as their 'greenest' models.

February - Philips follows the demands of Greenpeace and the public to become a leader in environmentally-friendly and ambitious take-back policies for electronic waste, which exceeds legal requirements in many countries.

February - Greenpeace exposes the illegal and immoral e-waste trail by tracking one television for several months from a recycling center in the UK to a scrapyard in Nigeria

April - Greenpeace launches the Cool IT Challenge, calling on the IT industry to lead the world in climate change solutions

June - Dell and Nokia join HP and Philips in making commitments to substantial absolute cuts in greenhouse gas emissions from their own operations.

July - Greenpeace calls on HP to stop dragging its feet by delaying its own deadline to eliminate toxic chemicals at its Palo Alto, CA headquarters.

image 5 2008 – As Philips celebrates 110 years on the Russian market in Moscow's Red Square, Greenpeace activists unroll a banner with the phrase 'Philips: simply take back & recycle!' in Russian and English.

image 6 2009 – Greenpeace tracks a TV set - originally delivered to a municipality-run collection point for discarded electronic products in the UK – to a scrapyard in Nigeria. Using a combination of GPS, GSM, and an onboard radiofrequency transmitter placed inside the TV, Greenpeace was able to prove that, rather than being recycled, it was being sent to Africa.

image 7 2009 – Greenpeace presents a framed picture, of a 2004 action in front of the Hewlett Packard office in Utrecht, to a company representative in 2009, reminding HP to keep its promise to clean up its act.

image 8 2009 – A Greenpeace action in the US exposed HP's continuing contribution to toxic e-waste, with the message 'HP = Hazardous Products' painted on the roof of the company's global headquarters.

What you can do: steps you can take towards helping to green the electronics sector

- Browse our campaign webpage on www.greenpeace.org/international/campaigns/toxics/electronics and engage with us in greening the electronic sector.
- Check regularly our 'Greenpeace Guide to Greener Electronics'; when buying electronic products, use the Guide to identify the makers of greener models available for purchase and to choose only manufacturers consistent in their efforts to green their act and who offer free take-back globally.
- Take action to turn IT companies into climate leaders at www.greenpeace.org/coolit
- If you're disappointed with your favourite brand's environmental performance, do let them know!
- When your device becomes obsolete return it to the manufacturers for them to ensure a sound waste management – if you face refusal, make a complaint and let us know what kind of response you receive!
- Talk to your friends and relatives about the dangers of toxic chemicals in electronic devices and the growing problem of e-waste – the more people who share your concerns, the more people will demand that producers live up to their responsibilities.
- Get involved! You can join our global community of online Greenpeace activists or use your own website or blog to spread the word, you can volunteer or work for us, make your life a little greener by following our tips for green living or you can share with us your own ideas. Details of how to do all of these things can be found on our website at www.greenpeace.org/international/getinvolved
- Or, you could donate to Greenpeace. We don't accept donations from governments or corporations, so the money needed to keep our campaigns running comes from people like you. Your support will make all the difference: www.greenpeace.org/international/supportus.

Further Viewing: Greenpeace Photo-Essays

Following the E-Waste Trail
From the UK to Nigeria
www.greenpeace.org/international/photosvideos/greenpeace-photo-essays/following-the-e-waste-trail

Scrap Life: E-waste in Pakistan
http://www.greenpeace.org/international/photosvideos/greenpeace-photo-essays/scrap-life-pakistan-with-rob

Further Reading: Greenpeace Reports

Apart from the Greenpeace Guide to Greener Electronics, we have also published several reports providing further information on toxic technology:

Hazardous Chemical Pollution of the Pearl River
Published October 2009
www.greenpeace.org/international/press/reports/hazardous-chemical-pollution-o

Green Electronics: The Search Continues...
Published January 2009
http://www.greenpeace.org/international/press/reports/green-electronics-survey-2

Poisoning the Poor - Electronic Waste in Ghana
Published August 2008
www.greenpeace.org/international/press/reports/poisoning-the-poor-electonic

Playing Dirty: analysis of hazardous chemicals and materials in games console components
Published May 2008
http://www.greenpeace.org/international/press/reports/playing-dirty

Searching for Green Electronics
Published March 2008
http://www.greenpeace.org/international/press/reports/searching-for-green-electronics

Toxic Tech: Not in Our Backyard
Published February 2008:
www.greenpeace.org/international/press/reports/not-in-our-backyard

Toxic Chemicals in Computers, Reloaded
Published October 2007:
www.greenpeace.org/international/press/reports/laptopreport2

Extended Producer Responsibility in a non-OECD Context
Published August 2007:
www.greenpeace.org/international/press/reports/extended-producer-responsibili

Cutting Edge Contamination: A Study of Environmental Pollution during the manufacture of Electronic Products
Published January 2007:
www.greenpeace.org/international/press/reports/cutting-edge-contamination-a

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Available at: www.mait.com/pressupdate1.jsp?Id=77.

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Other Campaigning Groups

- **On e-waste trade: Basel Action Network –** www.ban.org
- **On the social aspects of electronics: GoodElectronics (a coalition of NGOs and unions) –** www.goodelectronics.org
- **US Electronics Take-Back Campaign –** www.computertakeback.com
- **Indian NGO, Toxics Link –** www.toxicslink.org
- **Industry and NGO coalition on EU policies –** www.iprworks.org

GREENPEACE

Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

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