Eliminating Hazardous Substances and Industry Taking Responsibly for E-waste

Green Electronics Campaign Achievements

Greenpeace's Green Electronics campaign, launched in 2005, has seen great success in influencing the electronics industry to take greater responsibility for its own global environmental footprint. The campaign has been able to do this in three ways; building a steady stream of evidence that the industry is contributing to chemical pollution around the world, encouraging companies to take-back and recycle their end-of-life products, and empowering companies to place products on the market which don't contain certain hazardous substances. Persuading the companies to lobby for legislation, both for e-waste and for the phase out of hazardous substances, has also been significant. The following overview of achievements by the Green Electronics campaign covers the timeframe of 2005 to October 2010, five years of global mobilisation of both Greenpeace supporters and the electronics industry.

Eliminating hazardous substances from consumer electronics

Holding an electronic product in our hand represents a mere moment in the overall lifecycle of the product. From manufacturing to disposal, the chemicals the electronics industry uses impact the world around us.

One way to understand the magnitude of this impact is to look at the disposal of our electronics. E-waste is one of the fastest growing types of hazardous waste globally; it has been estimated by UNEP that, every year, upwards of 40 million tonnes of e-waste are generated world-wide. WEEE, (waste from electronic and electrical equipment), is classified as hazardous waste due to the many toxic ingredients it contains, including heavy metals and harmful, persistent chemicals, with the potential to pollute the environment and damage human health when it is processed, recycled or disposed of.

In an effort to define the scope and depth of the problem relating to irresponsible handling of WEEE, Greenpeace released several reports throughout the Green Electronics campaign. *Toxic Tech: Recycling of Electronic Waste in China and India*[1] (2005), *Toxic Tech: Not in My Backyard*[2] (2008), *Poisoning the Poor – Electronic Waste in Ghana*[3] (2008) and *Toxic Transformers: The Hazardous of Brominated and Chlorinated Substances in Electronic and Electrical Equipment*[4] (2010), are four of the reports that were significant in building the case for the electronic industry to clean up and take back their own products.

These reports effectively laid out the evidence that without the elimination of toxic chemicals, safe recycling of e-waste is impossible and that manufacturers must be held accountable for their own products once they become obsolete.

1 www.greenpeace.org/international/press/releases/toxic-technology-contaminates/
2 www.greenpeace.org/international/en/publications/reports/not-in-our-backyard/
3 www.greenpeace.org/international/en/news/features/poisoning-the-poor-electroni/
4 www.greenpeace.org/international/en/publications/reports/toxic-transformers-briefing/

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Alongside these reports, the *Guide to Greener Electronics* - launched in August 2006, with the demands 'Clean Up and Take Back' - highlighted the gap in leadership between companies within the industry. Companies were ranked according to several criteria across the issues of chemicals and e-waste. As a result, they were seen as leaders or laggards, depending on the amount of effort put into redesigning products to no longer include the most hazardous substances and the extent of their efforts to take-back and recycle their own brand e-waste in all regions of the world their products are sold.

As evidence for the environmental and health impacts of electronics that include hazardous chemicals was mounting, Greenpeace increased the pressure on the industry to create strong chemical management policies and set timelines to eliminate the most hazardous substances from products on the market. Greenpeace and its activists around the world then closely monitored the progress each company was making to meet these commitments.

Origin of Green Electronics Campaign to eliminate hazardous substances

Beginning its Green Electronics campaign in January 2005, Greenpeace was able to build on the achievements of previous campaigns to persuade manufacturers and brands to 'substitute' hazardous chemicals with safer alternatives, aimed at influencing proposed legislation in the EU on hazardous chemicals, known as REACH (Registration, Evaluation, Authorisation and Restriction of CHemical substances). The Chemical Home website was developed early in this campaign and proved a useful and influential tool. The website was a virtual home that supporters toured to learn more about the toxins hidden in everyday products. It ranked companies from a large variety of sectors, including cosmetics, toys, and sports shoes as well as paints and children's-wear. Manufacturers of mobile phones, PCs and TVs were also included, effectively introducing Greenpeace to the electronics industry. Companies were asked to commit to substitute hazardous substances, specifically PVC vinyl plastic and brominated flame retardants (BFRs).

Chemical regulation

Although EU legislation called RoHS (Restriction of Hazardous Substances) was implemented in July 2006 that banned the use of certain hazardous substances in electrical and electronic products to facilitate safer recycling, it did not address the use of all BFRs and PVC plastic in electronics. Both of these substances are a major source of chemical by-products at the end of life stage of electronic products, as most recycling and disposal takes place in developing nations where there is no safe recycling infrastructure in place and little to no worker and environmental protection laws.

The *Guide to Greener Electronics*

When the main tool for the Green Electronics campaign - the *Guide to Greener Electronics* - was launched in 2006, the most progressive companies had already begun to both define their own chemical management policy and to set timelines on phasing out the most hazardous chemicals such as PVC plastic and BFRs. Sony Ericsson had already produced mobile phones without BFRs in their circuit boards and casings, and Nokia had virtually completed its phase out of PVC plastic.

The first commitments and early leaders

The year the Guide launched, five companies set target dates. In June, Dell announced a phase-out date of December 2009 for both PVC plastic and BFRs. Then in August, both Samsung and LGE set phase-out dates. Samsung set a target date of 2010 for PVC plastic and 2011 for BFRs. LGE committed to eliminate both PVC plastic and BFRs by the end of 2010. By the end of 2006, the PC makers Lenovo and Acer joined them with commitments to phase out PVC plastic and BFRs by the end of 2009.

Early industry leaders began to emerge almost immediately. Sony Ericsson was the first company to launch PVC/BFR-free new models of products. All new Sony Ericsson products were PVC-free from 2007, with the exception of cables in early models of chargers, and virtually BFR-free from January 2008. Antimony, beryllium and phthalates are all listed as banned substances by Sony Ericsson, with a few exemptions for products placed on the market before 1 January 2008. Nokia's new models were free of PVC plastic by the end of 2005 and free of BFRs and antimony trioxide by the end of 2009.

But, just as industry leaders began to appear, other companies needed more pressure. Greenpeace ran a creative and award-wining Green My Apple campaign that generated pressure from Apple customers themselves. In late 2006 and early 2007, Greenpeace activists highlighted Apple's lack of a chemical phase-out policy and timeline at Apple stores in both New York City and San Francisco. Finally in May 2007, Steve Jobs announced that Apple had created a roadmap that would lead to PVC and BFR free Apple products no later than December 2008, an entire year earlier than any other personal computing company. New Apple products free from these substances were launched in September 2008 and in a PC industry first, by March 2009 all Apple's products were PVC and BFR-free, excluding the power cords.

Backtracking on commitments

As 2009 was underway, all eyes were on Dell and HP, as both of these companies' final deadline to eliminate these same hazardous substances was December 2009. As conversations between Greenpeace and HP continued it became clear that they would not meet their public deadline. To protest this broken promise, Greenpeace activists painted the words Hazardous Products with non-toxic children's paint on the roof of the company's Silicon Valley headquarters. HP customers from all around the world sent messages to the company and each HP staff member in the building received a call from actor William Shatner, expressing customers' disappointment for this broken promise. A penalty point was imposed on HP's score in the *Guide to Greener Electronics*. By the beginning of 2010, the company's commitment to meet its new deadline of 2011 (albeit now for computing products only) strengthened. HP released the industry's first Windows PVC and BFR-free desktop at the Consumer Electronics Show in January 2010.

However, there was less progress evident from Dell, who had also backtracked on its commitment to phase out PVC and BFRs by 2009, setting a new timeline of the end of 2011, also reducing its commitment to computing products only. By the end of 2009 it was becoming clear that other companies were failing to meet their commitments; Lenovo, Samsung and LGE joined Dell, and all were given penalty points in the *Guide to Greener Electronics*. Toshiba also failed to meet its deadline to phase out PVC and BFRs in all of its products by April 2010 and Microsoft backtracked on its end of 2010 timeline in September 2010; both were penalised in the 16th version of the Guide.

By the beginning of 2010, there began to be a clear division between industry leaders and industry laggards on this issue, with those companies served penalty points lagging behind. Positive developments came from HP and Acer; HP's penalty point was lifted once products free from PVC and BFRs were launched, and Acer avoided a penalty point by bringing PVC/BFR-free products onto the market at the beginning of 2010 and by demonstrating it had a plan to meet its new deadline of end of 2010. The Indian companies Wipro and HCL also brought PCs and notebooks onto the market in early 2010, avoiding penalty points in the Indian version of the Guide.

Also in September 2010, Philips released the industry's first PVC and BFR free television in Europe but at the time of this printing it became clear that the company would not meet its deadline of December 2010 for all consumer products, though a new commitment date to do so has not yet been communicated to the public.

Products on the market

Even though several companies have had to delay target dates to phase out the most hazardous substances, there are considerably more products on the market today than when the first edition of the *Guide to Greener Electronics* was launched. The industry has clearly changed its approach to chemicals management by either eliminating the most hazardous substances from a few niche products or by completely eliminating them from all their product lines. Mobile phones have shown the most progress, with most of the market leaders now producing halogen-free mobile phones, followed by PCs; clearly the technical barriers to phasing out PVC and BFRs have been mostly overcome. The Industry Association INEMI has published a timeline that shows that halogen free components for PCs (notebooks and desktops) will be widely available in the supply chain by the end of 2011, including the evaluation and qualification of parts for high performance printed circuit boards[5]. TVs have shown the least progress; the remaining stumbling block being the availability of PVC and BFR-free components throughout the supply chain.

This progress has also been translated into efforts by the most progressive companies to influence legislation. Several companies have proactively lobbied the EU on its revision of the RoHS Directive, advocating the adoption of a 3 to 5 year timeline for further restrictions on organo-chlorine and bromine substances (which includes PVC and BFRs). Companies that have been rewarded with maximum points in the Guide for their efforts are Sony Ericsson, Dell and Acer; also supporting the ban are Apple and HP. Unfortunately, in this case the legislators have

[5] INEMI Timeline for HFR-Free Electronics and PVC-Free Cabling for Notebook and Desktop Products, October 2010, http://thor.inemi.org/webdownload/projects/ELSC/HFR-Free_PVC-Free_Timeline.pdf

proven to be less progressive than the industry, as the EU has now agreed to abandon the list of priority substances that may eventually be banned.

Product survey

As the industry has shown progress, Greenpeace has sought to assess the actual products coming into the global marketplace. Using information submitted by companies in late 2007, we published the first edition of our *Green Products Survey* [6] in March 2008, during the international electronics fair CEBIT, held in Hanover, Germany. The report was met with enthusiasm from the industry and customers alike, and so we released a second edition in January 2009[7] during the annual CES electronics fair in Las Vegas, USA. Unlike the ranking of manufacturers in the *Guide to Greener Electronics* described above, which focuses on overall corporate policies and practices, these surveys consisted of an in-depth evaluation of the products that the manufacturers themselves considered to be their greenest.

The first edition revealed that none of the surveyed products could claim the title of being truly green, with only a few products barely scoring 5 out of 10 points. The second product survey reflected the progress of the companies who chose to participate. Progress was particularly noticeable in the designing-out of toxic chemicals from products; more scores were above the highest score of 5/10 from the previous edition, and the gaps between company's scores shrank. These changes revealed the more competitive environment between the brands that had emerged. Yet, despite a notably improved performance in the monitors category, it was evident that progress was still needed within the industry. As a result Greenpeace advocated for further efforts in all products categories before a 'truly green' consumer product could emerge on the market. Since this last survey, the industry has shown considerable progress in delivering greener products, and therefore we decided that a third edition of the product survey was necessary. Through this third edition of the *Product Survey,* released January 2011, we found that- again- there was significant progress made in reducing the amount of hazardous substances in electronics products but the industry was making the least amount of progress in taking responsibility for its end-of-life products.

Progress on e-waste

Greenpeace worked on the removal of hazardous substances as a priority as the most effective way to prevent environmental contamination due to these substances. However, it was also necessary to address the problem of the growing quantities of e-waste more directly.

The problem of e-waste is being tackled through two tracks; legislation and company policy. The European Union (EU), Japan, South Korea, Taiwan and several States of the USA and Canada have introduced WEEE (Waste from Electric and Electronic Equipment) legislation, making producers responsible for their end-of-life products. Similar legislation is being developed in some non-OECD countries such as China, India, Thailand and Argentina. Greenpeace's campaign work in India was a crucial factor in bringing producer responsibility legislation to the government with support from many companies in the Indian electronics industry. However, no such regulations exist in many of the countries in Asia and Africa that are a destination for exports of e-waste. Even in the EU, where some of the more stringent regulations apply, as much as 75% of generated e-waste is unaccounted for.

Newly-industrialised countries like China and India have large informal recycling sectors, where the focus is on the recovery (albeit inefficient reclamation) of valuable raw materials and not on the health and environmental hazards inherent in e-waste, resulting in environmental pollution and exposure of workers to hazardous substances from the recycling of e-waste. These primitive treatment methods result in considerably lower end-of-life costs than in OECD countries.

This 'cheap' form of recycling drives the import of e-waste from developed countries such as the US and the EU, often in the guise of products donated for 're-use', which add to the growing e-waste problem in non-OECD countries such as China, India, Pakistan and, more recently, West African countries such as Ghana and Nigeria, where the methods used to recycle e-waste are even more basic. As domestic sales of electrical and electronic appliances are set to escalate in non-OECD countries, the quantities of e-waste will be much higher in the future.

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6 www.greenpeace.org/international/press/releases/cebit-talks-green-but-the-ind/

7 www.greenpeace.org/usa/en/media-center/reports/green-electronics-the-search/

Taking responsibility for e-waste
To address this appalling situation Greenpeace called for companies to take responsibility for their own products at the end of their lives – rather than leaving them to become part of the general waste stream. The concept of Individual Producer Responsibility (IPR) is key to making this a reality and includes the take-back and recycling of a company's own brand e-waste, so that these costs are paid by the individual company which in turn influences the re-design of new products.

Individual Producer Responsibility
It is important for a company to support and demand Individual Producer Responsibility (IPR) as this shows positive action in getting its own branded products back for reuse and recycling, to be able to profit from product eco-design. Companies supporting IPR believe that their product design innovations should be rewarded. Greenpeace expects responsible companies to support, at minimum, financial responsibility for their own-branded end-of-life products. Physical responsibility is not always feasible and could result in duplicated infrastructures e.g. for e-waste collection.

Active support and demand for IPR requires:
- take-back and recycling systems that support branded end-of-life product differentiation
- high collection and take-back levels (e.g. aiming for above 95% of all e-waste generated), at least of own branded waste
- support for strong WEEE legislation
- continuation of this same approach globally.

In summary, brands supporting IPR should be striving to internalise the real own-brand end-of-life costs into the company business model. Companies opposing IPR, (or even the principle of Extended Producer Responsibility) and calling for collective producer responsibility or for customers to pay recycling fees are driven by wanting the costs of treating their end-of-life products to be carried by taxpayers/customers and/or cross-subsidised by the other companies on the market.

Dismantling the ARF coalition
A major barrier to implementing IPR was a US-based lobby group of TV manufacturers, the Electronic Manufacturers' Coalition for Responsible Recycling (EMCRR). This group did not support IPR for e-waste generated by electronic products but instead demanded that customers pay Advanced Recycling Fees (ARFs). In December 2006 Greenpeace challenged member companies that stated public support for IPR on their websites for practising double standards, by warning that they would incur a penalty point in the *Guide to Greener Electronics*. The first company to leave the Coalition was Samsung in April 2007, followed by Sony and LGE in September 2007. As other member companies – Toshiba, Philips and Panasonic – stated their support for IPR, they too were threatened with a penalty point for double standards. Toshiba left the Coalition before the penalty point was imposed but both Philips and Panasonic incurred a penalty point. Panasonic then also left the Coalition, which was ultimately dissolved by its remaining members (Philips, Sharp and Sanyo) in August 2008[8].

Implementing take-back programmes
Given that so many parts of the world have yet to act strongly on where and how e-waste is disposed, Greenpeace has put considerable effort into pressuring companies to implement their own take-back programmes.

Greenpeace tested the take-back practices of three companies – Nokia, Motorola and Sony Ericsson - between November 2007 and May 2008, in five different countries: India, Russia, Argentina, the Philippines and Thailand. It was revealed that Sony Ericsson had no take-back service in these countries and it consequently lost points in the Guide. Nokia's and Motorola's take-back programmes were not functioning as claimed and both companies received a penalty point as a result of complete ignorance of company take-back policy at ground level or among front line staff, showing corporate misconduct, lying and double standards. Motorola's penalty point was lifted in February 2008 as a result of improvements following re-testing of its take-back programme. Nokia's penalty point remained in place until September 2008, following a Greenpeace survey[9] which examined the take-back programmes in India of most of the ranked brands. This revealed that Nokia has one of the best take-back programmes in India, even though there are still problems in the smaller cities.

8 www.computertakeback.com/news_and_resources/press_releases/index.cfm?pressReleaseID=34
9 www.greenpeace.org/india/Global/india/report/2008/8/take-back-blues.pdf

Dell was an early leader on take-back, being the first company to announce a global take-back programme in January 2007, although it is still in the process of implementing this. Nokia is now the best performer on take-back and is leading the way in implementing global voluntary take-back for its own branded obsolete products, having extended its programme to 85 countries, with almost 5,000 collection points so far. Five other companies – Motorola, Dell, Apple, Panasonic, and Lenovo – have also scored well (as of v.16) in the *Guide to Greener Electronics* for their voluntary take-back programmes. However, many companies still have a long way to go, as many of them only offer take-back for a limited range of their products and progress in extending their take-back programmes into non-OECD countries has been slow. For example, the only take-back programme specifically for TVs in a non-OECD country was launched in 2010 by Panasonic.

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