

# Technology Troubles

## Overcoming the Challenge of E-Waste in China

by GREEN INITIATIVES

Managing Waste Electrical and Electronic Equipment (WEEE), also known as e-waste, is a growing challenge in China. An increase in China's domestic consumption of electrical and electronic goods, large imports of e-waste from the West, and the informal treatment of e-waste has created significant obstacles for the Chinese to overcome in order to effectively reduce and treat e-waste.

China's dramatic domestic development in the last century has created both positive and negative results. Positive results include improved standards of living, better welfare, and increased international exposure. Some of the negative results of this rapid growth include air pollution as well as the massive generation of waste, which has had a huge impact on the environment. More recently, rising incomes of China's burgeoning middle class has made technology more accessible, which has also contributed to increased e-waste generation. The quantity of e-waste disposed domestically is growing exponentially. According to China Household Electric Appliance Research Institute (CHEARI), In 2011, ten million units were disposed; in 2014, the number of units disposed increased by tenfold to over 110 million.

In addition to the increasing amount of e-waste generated domestically in China, huge quantities of e-waste are imported from abroad for treatment and disposal. According to the China Business News report, China is the final destination for 70% of the world's 500 million tons of e-waste annually. Currently, e-waste is primarily generated by western countries; however, as India and Southeast Asia continue to develop, these countries also pose a threat to exacerbate the problem.

It is estimated that 60% of China's e-waste is treated in informal waste centers with low safety standards and low-cost labor. Informal waste centers are often small-scaled, family-run, backyard recycling workshops which makes it difficult for the government to manage the treatment of e-waste. Currently, e-waste treatment occurs primarily in cities along the Southeast coast of China, most notably in Guiyu in Guangdong province. Guiyu is widely known as the largest e-waste recycling destination in the world. At its peak, approximately 5,000 workshops in Guiyu recycle 15,000 tons of e-waste daily.

There is a solution to the e-waste problem in China, however, it will require a collaborative effort by the Chinese government, individuals and industries.

### **Negative Environmental and Health Impacts of E-Waste**

The informal treatment and disposal of e-waste has both direct and indirect impacts on the public and environmental health. The treatment process primarily consists of burning, shredding, and using acid baths to extract precious metals from the collected items, these processes directly and indirectly harm both humans and the surrounding environment in China.

Throughout the informal e-waste treatment process, workers frequently come into direct contact with Polychlorinated Biphenyls (PCBs), which are proven to have mutagenic effects on human hormones in both adults and children. Acid baths, burning, and shredding releases harmful emissions into the environment. It is reported that 80% of children in Guiyu suffer from lead poisoning, which is damaging to human cardiovascular, reproductive and nervous systems.

Negative environmental externalities caused by the treatment and disposal of e-waste are well-documented. Toxic chemicals such as cadmium, lead, and mercury are harmful to ecosystems in the surrounding areas. High levels of mercury contamination have been linked to the death of vegetation, marine life, and birds. In Guangzhou city, roughly 400 kilometers away from Guiyu, city officials found high rates of cadmium in the soil and groundwater, rendering it toxic.

The negative environmental and health impacts of e-waste demonstrate the pressing need for China to reduce and manage e-waste.

### **Policies Implemented by the Chinese Government to Manage E-Waste**

China (People's Republic of China or PRC) has implemented several programs to reduce and manage e-waste, including establishing production standards for electronic products, implementing consumer engagement programs, and providing financial support for treatment facilities.

The Ordinance on Management of Prevention and Control of Pollution from Electronic and Information Product, commonly known as China RoHS, has been enforced since 2007. In 2014, the PRC re-published

the WEEE Treatment List to include 14 products categories such as mobile phones, air conditioners, and televisions. The WEE Treatment list places regulations on the use of hazardous materials, product labelling and reporting, as well as suggestions for recycling and disposal. In January 2017, China's State Council issued a new Extended Producer Responsibility (EPR) plan to ensure the environmental sustainability of a product throughout its lifecycle.

Consumer engagement programs are also crucial to reduce e-waste generation. From 2009 to 2011, the PRC offered rebates to customers who traded in older appliances when purchasing a newer model. More recently, a mobile application called Baidu Recycle Station was launched in partnership with the internet giant Baidu to help consumers identify safe ways to dispose their e-waste while offering them a small financial incentive for it. The app's goal is to bring consumers, manufacturers, and treatment facilities together to streamline the recycling and disposal of e-waste in China.

In 2012, the Chinese government implemented the WEEE Treatment Fund Policy, which created a framework for providing financial support to e-waste treatment facilities. The WEEE Treatment Fund Policy is supported by three PRC ministries, including the Chinese Ministry of Finance. Funding is generated through levies placed on manufacturers and recipients of imported electronics. These funds are then distributed as subsidies to WEEE recycling and disposal facilities. The PRC revises WEEE standards regularly, with the most recent revision in 2016 addressing changes to five product categories and standardizing subsidy rates for e-waste recycling.

The PRC's efforts to reduce and manage e-waste are impressive, however, more will have to be done in the future to overcome the growing e-waste problem.

### Individual Actions to Reducing E-waste

There are various actions that individuals can take to limit e-waste and the associated pollution.

First and foremost, it is essential to embrace conscious consumerism by reducing purchases, choosing better quality and longer lasting products, as well as buying environmentally friendly electronics or from brands that are more responsible. Users can take good care of electronics to prolong a product's life-cycle and prevent unnecessary waste. Finally, end-users can responsibly recycle electronics through local recycling programs, ensuring materials can be salvaged for re-use or disposed of properly.

It is important to note that with an increased number of e-waste recycling solutions, consumers also have an added responsibility to ensure that the organizations who are providing them with recycling solutions are both licensed and safe. This will help ensure that fewer e-waste ends up in the informal recycling sector.

### Industry Actions Towards Reducing and Managing E-Waste

Industry changes to the production of new electronic goods and e-waste treatment standards will help reduce and manage the adverse impacts of e-waste.

Establishing industry-wide standards on sustainable design, eco-friendly materials, and eco-friendly manufacturing is the first step

towards sustainable growth. Producing better quality products that embody a 'zero-waste' design approach will play a big role in reducing the generation of e-waste. Making 'modular', 'evolutionary' products will also encourage consumers to use products longer and potentially alter consumers' purchasing behavior.

Providing efficient and affordable 'repair' solutions will have a huge impact by reducing the amount of e-waste that is generated, and extending product lifecycles when they would otherwise be considered as waste. Placing an increased amount of responsibility on producers for e-waste treatment via Extended Producer Responsibility (EPR) is important to 'close the loop' of e-waste. Finally, improving internal e-waste treatment monitoring, processes, and standards will also reduce the associated negative impacts on humans and the environment.

### What's Next and How Consumers Can Help

E-waste has had multiple negative impacts on China's environment, but measures taken by producers, consumers, and the government to improve current conditions and promote sustainable growth provides hope for a brighter future. As e-waste generation increases domestically and globally, it is becoming increasingly important for China to enforce and improve standards to avoid further environmental and health degradation.

Adopting a cradle-to-cradle design approach to create high-quality, eco-friendly, and safe products is the first step towards reducing e-waste. It is equally important for consumers to reduce consumption, re-use products as much as possible, and efficiently recycle towards the end of use. Finally, enforcing and improving e-waste treatment standards will reduce the adverse impacts of e-waste treatment and disposal on humans and the environment.

China is not the only country that faces the challenge of reducing and managing the generation of e-waste. E-waste is a global challenge that will require a collective effort that incorporates government, industry, and individual action to ensure the healthy future of our planet and its inhabitants.

This article was a collaborative effort between various members of the Green Initiatives team. For any enquiries or feedback on the content of this article, please write to: [info@greeninitiatives.cn](mailto:info@greeninitiatives.cn).

Green initiatives (GI) is a volunteer-led nonprofit organization based in Shanghai since 2009. GI's mission is to increase education on environmental issues while providing local solutions to environment and waste problems in cities. GI organizes regular community activities to spread awareness on a wide range of environmental issues, and implement impact-focused scalable programs to engage businesses through CSR:

*GI launched the [WE] Project in 2016 to provide the local community and companies in Shanghai with a transparent, systematic and environmentally-friendly way to dispose/recycle unwanted and broken electronic items. The project is currently being planned for launch in other cities. For any enquiries on [WE], please contact [we@greeninitiatives.cn](mailto:we@greeninitiatives.cn)*