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by

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**E-waste Trafficking: From Your
Home to China**

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Abstract

E-waste Trafficking: From Your Home to China

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SUPERVISOR: Dennis Darling

Electronic waste generally means discarded or obsolete electronics products. Around 20 to 50 million tons of e-waste is generated worldwide every year. The United States is the world's largest e-waste producer, generating about 2.5 million tons of used electronics annually. However, American recyclers get to choose their own methods of recycling because there is no national legislation to regulate it. Often, the result is witnessed thousands of miles away, in growing dumping grounds in developing nations like China. Guiyu is a town in southeastern China that has become a center for processing imported e-waste. Local people extracting metals from e-waste use primitive methods that cause great harm to the environment and their health. I am doing a combination written and visual project to provide an overview of how e-waste trafficking works and what damage has been brought to other countries from U.S. e-waste exports.

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Forgetfulness

On a sunny Saturday morning in Williamson County, Texas, a man drives his pickup truck slowly onto the left side of the parking lot at the East Williamson County Event Center, where computers, televisions and monitors have been piled up on the ground. Today is the “Hazardous Waste Collection Day” for people in Taylor and nearby counties, and residents are gathering to drop off their old electronics. A couple of staff members come to help the man in the pickup lift two bulky televisions and a computer monitor to the collection point.

“They are no longer working,” says the man, William Jackson, a Taylor resident. “This is an opportunity to dispose of them properly.” Jackson is more than happy to get rid of his old televisions, which have been taking up a lot of space at home for some time, he says.

Melanie is also a Taylor resident who says she prefers to give only her first name. She has come to the event to drop off her old computers. “I am glad that they will do something rather than just dumping my computers in a landfill,” she says. “I just want to help out with the problems so that I can do my part for the environment.”

The day’s event is organized by Environmental Business Services of Goodwill Industries of Central Texas and Houston-based Waste Management Inc., America’s largest residential recycler. The goal is to give people in the area the opportunity to donate those end-of-life electronics.

“People tend to hold on their electronics waste and keep them in their garages for a long time because they don’t know what to do with them,” says Robin Llewellyn, director of environmental business services at Goodwill Industries of Central Texas.

Yet what will become of their electronic waste after the event seems to be beyond their knowledge. Melanie says that hopefully people in the event will replace the hard drive she removed and use it to give people educational opportunities. Jackson says he doesn’t have a clue how his old televisions are going to be recycled.

“I don’t know,” Jackson says, “but people who understand recycling know how to do it. There are some good parts in my old television. I am sure it can be used in another way.”

Instead of calling the old sets electronic waste, Llewellyn prefers to call them “resources.” She says the computers collected from residents and businesses in this event will later be dismantled to see if the computer parts can be sold.

“We have to make sure that we’re handling these resources responsibly and not sending waste overseas.” Llewellyn says.

For ordinary consumers, finding out exactly how their tech-trash is recycled can be a challenge. Most of the time at this event, people drop off their old electronics and leave without any questions for the recyclers.

Call it a case of globalized forgetfulness. Last year consumers worldwide bought 350.9 million personal computers and 417 million mobile phones, according to the research company Gartner Inc. The global market of electronic waste, or e-waste, is also growing with consumerism; it will reach 53 million tons by 2012 from 42 million in 2008, according to a report by TechNavio, a market research firm specializing in hardware field.

E-waste recycling is a lucrative business worldwide. The companies that deal with electronic waste recovery will see their revenue grow from \$5.7 billion in 2009 to \$14.7 billion by 2015, according to ABI Research, a New York-based firm that provides research on global connectivity and emerging technology.

The United States is the world leader in producing e-waste, generating around 2.5 million tons annually, according to the Environmental Protection Agency. However, e-waste is mostly unregulated by the federal government, which allows private companies to choose their own methods of recycling. Often, the result is witnessed thousands of miles away, in growing dumping grounds in China, India and West Africa where America’s e-waste is exported and can cause harm to local people’s health and the environment when discarded products are recycled by burning, breaking and dismantling.

International communities feel the effect of these dumping grounds, and of America’s penny-pinching approach to recycling. American recyclers cash in by collecting

e-waste for free and exporting it to developing countries where labor costs are extremely low, often around \$7 per person per day, but still higher than most local people can earn in more traditional jobs, like farming.

Among the countries importing Western e-waste, China, the world's largest manufacturer, is one of the largest dumping grounds. A large scale of primitive e-waste recycling was first fully documented in the southern coast area by Western activists a decade ago.

In 2001, the Basel Action Network, an American toxic trade watchdog organization, made a video project showing Western computers being dumped and processed improperly in a southern Chinese town, Guiyu, in Guangdong Province. The organization claims that 75 percent of e-waste in China comes from North America.

Guiyu processes about 1.5 million tons of e-waste each year, pulling in \$75 million in revenue, according to the Chinese government. Most of the e-waste comes from overseas. There are more than 5,000 mom-and-pop recycling workshops in Guiyu. However, the town has paid the price: The soil, water and air are all contaminated. Guiyu also has the highest levels of cancer-causing dioxins in the world, according to a study by Shantou University.

It may take a while to change a one-industry town like Guiyu. The local economy has been highly dependent on recycling activities for years. Local government officials have already closed hundreds of open burning sites because of negative media attention and pressures from international environmentalists groups. However, the challenge remains: The majority of people in the town—100,000 of the 150,000 residents—depend on e-waste recycling for their livelihood.

In the U.S., the Environmental Protection Agency has acknowledged that a significant portion of the nation's e-waste is exported. Last year, the EPA released a memo in which it added e-waste to one of the nation's international environmental challenges. But there is still no mandatory certification process for electronic waste recyclers in the U.S.—any company can claim to be a responsible recycler.

In fact, there are two domestic third-party certification recycling entities, Responsible Recycling Practices (R2) and e-Steward. The e-Steward certification has received positive comments from environmentalist groups because it specifically prohibits exporting e-waste as well as illegal traffic in hazardous waste. But neither group's certification is mandatory.

In 2008, an independent report by the U.S. General Accounting Office called for improved regulation of electronic waste in the U.S. In a comment letter on the findings, however, EPA officials said they believe that non-regulatory approaches can make an important contribution regarding safe exports of electronic equipment. "We are not convinced that developing a regulatory scheme to address these issues is the most appropriate course of action," the letter stated.

A middleman

"My five containers have been stuck in German customs, and they don't let me ship to China. Can you try to figure a way out?" Tom says into his phone. He prefers not to be identified by his real name partly because most of the e-waste trade he does is in a legally gray area. He says that he fears losing his clients' trust if he is exposed in the media.

Tom makes his phone call from the backseat of a car on the way to Guiyu, a town in southern China four hours' drive from Hong Kong. He is making as many calls as he can to save five containers full of scrap metals that cost him \$300,000. He lights a cigarette and checks the copper spot price on his iPhone.

Tom, a 32-year-old e-waste broker, is from southern Taiwan where ship recycling thrived in the 1980s; his father worked in the industry. Ship recycling has similarities with e-waste recycling, he says. They are all about extracting valuable metals from unwanted ones.

Tom hands a cigarette to the driver, who has been driving for three hours. Then he grabs his black laptop to see if there is anything wrong with the customs form that he filled out. The smoke quickly fills the car.

The five containers he is trying to ship are full of copper yokes. The yoke is the electromagnet on the back of a TV that deflects the electrons to the proper position on the

panel, according to *Waste Management Practice: Municipal, Hazardous, and Industrial* by John Pichtel.

Tom says those yokes can yield a huge amount of valuable copper. He has to ship them to his business partner in Guiyu so that he can make a profit on the price differences between the money he spent on these yokes from his upstream companies and the price at which he resells them to Chinese recyclers.

As Tom arrives in Guiyu, he looks out through the car window. The streets scenes passing by are now full of garbage-like bags, keyboards, and computers. Tom knows the squalid town lives off the tech-trash but is also a place where his money comes from. He is making profits in the industry, though he senses that Guiyu has been severely polluted.

Tom calls himself a “middleman”— one who buys electronic waste around the world, mostly from the U.S. and other developed nations, to ship to China. “From my understanding, there are about 30 to 50 people who do what I do as a middleman. They pretty much buy around the world,” Tom says.

Tom has been trafficking e-waste for 12 years and he says everything has been going pretty well. This is the first time that his containers have gotten stuck. But he says it is getting harder for him to do business in Europe, where exporting laws are getting strict, especially with an international treaty regulating e-waste.

That international treaty is the United Nations Basel Convention of 1989, which forbids sending hazardous waste from developed nations to developing ones. The convention was updated in 2006 to cover electronic waste. The United States is one of only three countries to have signed but not ratified the convention; the other two are Haiti and Afghanistan. Today, even the definition of e-waste recycling in the U.S. is not clear, since anyone can claim they are recyclers.

Environmentalists claim that a number of companies in the U.S. have been caught on camera exporting containers full of e-waste to developing countries. Executive Recycling Inc, a Colorado-based recycling company, was charged by federal grand jury with wire and mail fraud as well as environmental crimes this year. The company was caught sending monitors with cathode-ray tubes to China without a proper EPA license

after they claimed that they were not exporters. Environmentalists believe that it may be the first case of federal criminal charges against a recycler for exporting toxic e-waste.

“Recyclers in our country now have learned to say the right thing,” says Robin Schneider, vice chair of the Electronics Take Back Coalition and director of the Texas Campaign for the Environment. “They said that they are not exporting to developing countries but only OECD [developed] countries.” She says that it is really difficult to know where the containers will end up.

That is also why it is not hard for Tom to get electronic waste from the U.S. He says many American recyclers only collect e-waste, sort and shred it. Recyclers collect discarded electronics from people and businesses, they then shred the waste down to small pieces. A completed piece of printed circuit board or similar e-waste is illegal to export to less developed countries, he says, but it will work if they shred e-waste and mix it with aluminum and stainless steel, though “this is on the edge of the law.”

Recyclers load the e-scrap into sea-going containers and sell them to brokers like Tom. At that point, Tom ships the containers to places like Guiyu to process.

While Tom is trying to figure out how to ship his five containers out of Germany, the car stops in front of a three-story house. A middle-aged man walks out from a half-closed door and opens the car door for Tom. The moment he gets out, he starts to cough. A dense smell, like burning plastic, hangs over the street.

Electronics graveyard

It has been six years since Tom last visited Guiyu. But he is surprised to see the Liangjiang River still running dead black. The streets scenes have not changed too much; tons of old motherboards, printers and monitors are stacked up along the road everywhere. The retailers who sell scrap metal, IC components, second-hand laptops and cell phones are still there.

The man who opens the car door for Tom is Mr. Liao, who owns the recycling workshop located in this three-story house. He is not as tall as Tom and very skinny. He cautiously looks around when he opens the car door. Liao is not willing to give his full name because he doesn't want to draw the attention of local authorities. In the past few

years, the authorities have closed down some 800 coal-burning furnaces where e-waste was openly burned, according to Guiyu's official website. As a result, many workshops have moved into houses so they are not easily seen.

With its choking air and black polluted river, Guiyu makes its living as a graveyard for the toxic materials generated by the world's love affair with laptop computers, smart phones and other disposable electronic devices.

According to Jim Puckett, executive director of the Basel Action Network, the e-waste business was established in Guiyu long before 2001, when he visited for the first time to document conditions. During his stay, he was told that the e-waste recycling business already started five years before.

The business started small but grew quickly because it was profitable. Local farmers started to get involved because they made more money than farming, Puckett said in an interview.

The workers were burning the materials to extra copper and using acid stripping to get the gold from circuit boards, he recalled. "It can be very profitable. It's cheap to buy these materials because the U.S. recyclers need to get rid of them." Based on his tracking, about 75 percent of e-waste in Guiyu is from North America.

However, the actual e-waste volumes exported from the U.S. to Guiyu remains a mystery since the U.S. government does not monitor the e-waste trade.

Liao's recycling workshop receives e-waste from the U.S., Japan and other developed countries. The first floor of the house has big stacks of circuit boards, cellphones, printers and batteries. Workers are surrounded by these discarded electronics without protective clothing or eyewear.

A young woman in red shirt and blue jeans sits on a small chair next to a heap of circuit boards. She uses a hammer to break the circuit boards and plucks out the batteries. When asked about her hometown, she says she is from Sichuan Province, which is 1,000 miles away. "I already got used to the smell here," the woman says, smiling. She says the workshop shuts down temporarily if they know authorities are coming to do inspections. When that happens, she gets a day off.

Many workers in Guiyu are from distant provinces such as Guangxi, Hunan and Sichuan. They make the equivalent of about \$7 to \$10 per day, which is “much higher than they can get from [jobs in] their hometowns,” Tom says.

Liao shows Tom how a worker melts motherboards on top of a soup of tin; when the boards gets softer and liquid, the microchips are easier to pluck off. White smoke comes off the board. “We call it barbecue,” Liao says, laughing.

Sheng Zhang Peng, a 26-year-old man who was born and raised in Guiyu, says he has seen people recycling electronics and plastics since he was little. His family operated a recycling workshop at home back then, and he helped out every day. “The recycling industry here is mostly family-based small business units,” says Peng, who has started to take over his family’s recycling workshop this year. “It’s because this is a business that walks at the edge of the law, and also because we don’t want outsiders to get involved to take our money away,” he says.

Peng says most of the waste he gets is from the U.S.; the rest comes from East Asian countries such as Japan, South Korea and Malaysia.

What keeps the people in Guiyu engaged in the recycling business is simply profits. The town processes about 1.5 million tons of e-waste each year, pulling in \$75 million in revenue, according to the Guiyu township government website.

But these end-of-life electronics are a double-edged sword. Lack of technology and improper recycling processes that Guiyu people use have a serious impact on their health and environment. A team from Shantou University, an hour and a half drive from Guiyu, interviewed 297 local workers in 2003 and found that 260 of them had symptoms such as skin damage, headaches, vertigo, nausea, chronic gastritis and duodenal ulcers. Moreover, the study took blood samples from 165 children ages 1 to 6 in Guiyu; 82 percent of them had blood/lead levels of more than 100, which is considered unsafe by international health experts.

“The air we breathe every day is very horrible,” Peng says. “The water is undrinkable, and we can’t even wash our hands in the Liangjiang River now.” He doesn’t like his teeth very much because they are all dark yellow due to the polluted water he has

been drinking all his life. Peng predicts that either in his generation or the next people of Guiyu will have to move out.

Early this year, Peng started his own business for plastics recycling. “I use a lighter to burn the plastics a little bit then you smell it, so that I can know what kind of plastics they are,” he says. He admits that it might be harmful to his body, but he has no choice.

“When I make enough money, I will leave this town,” says Peng.

Stopover

The Chinese government has officially banned electronic waste imports and adopted the Basel Convention. But foreign e-waste still finds its way to the Chinese market through Hong Kong, which plays an important role in e-waste trafficking to the mainland.

Guiyu’s Mr. Liao also partners with another Chinese recycler, Shang, to operate an unlicensed e-waste storage area in northwest Hong Kong. Mr. Shang, who is not willing to disclose his real name for fear of triggering an investigation by Chinese authorities, is originally from Shantou in Guangdong Province. He says he has a relative who is an influential official in the Guangdong government, so he is not too worried about his illegal storage yard.

The main purpose of his storage yard is to unload containers smuggled from overseas, as well as to sort out usable electronic components. In fact, Hong Kong plays an important role in e-waste trafficking to the Chinese market. Although China banned e-waste imports in 2002, Hong Kong is a Special Administrative Region with its own legal system. Hong Kong’s waste disposal ordinance regulates used batteries and cathode ray tubes, but the restrictions on electronic waste are ambiguous.

In the U.S., Jim Puckett and the Basel Action Network have found that about 80 percent of the containers the group tracks leaving America are going to Hong Kong.

“Hong Kong is a free-trade harbor – the law of e-waste importing is not strict,” says Lai Yun, senior campaigner at Greenpeace China, which has been tracking the e-waste containers coming into Hong Kong for a decade. “Importing e-waste is technically not against any Hong Kong laws,” he says, adding that e-waste arriving there will typically be

sent into China in trucks or small boats. The busy trade volume and weak customs control between Hong Kong and China has made e-waste much easier to get into the country.

In Shang's storage area, large stockpiles of computers, old televisions, wires, adapters, cell phones, plastics cases and printed circuit boards are scattered openly on the ground. A couple of half-naked male workers are busy lifting three big lottery machines from New York City. Another plastic bag has ID tags reading "Japan Ishikawaken Police Station," along with a box of IBM laptop chargers and Asus CRT monitors. There is a heap of old machines with labels reading "County of Los Angeles, Agricultural Commissioner/Weights and Measures" including the name of the agency director on the ID tag.

"I got a lot of electronics waste, mostly from the U.S., Europe and Malaysia," Shang says, and he has just sent two truckloads into Liao's recycling workshop in Guiyu earlier this day. Shang says he only has an elementary school education. He was a part-time worker on construction sites and made only the equivalent of \$1.20 per day. When he got involved with e-waste recycling business through his friends 15 years ago, he put his low-income life behind him. He now owns a hotel in Shenzheng, Guangdong Province, he says.

"I can't speak English at all," Shang says. He receives e-waste from developed nations mostly through Tom, who is fluent in English, Mandarin, and Tagalog.

"The prices of gold and other rare metals have a pretty good price now, but copper has dropped drastically," Shang says. "The greater variety of the electronic waste I can get, the better profits I can make."

Sacrifices

After a tour around Shang's storage area, Tom makes a phone call in English. He tells the person on the other line end of line, whom he calls "Uncle Jack", what kind of electronic waste he sees here at the yard. After the phone call, he needs go to airport to catch a flight to Taiwan to take care of another e-waste business deal.

Since he got into the recycling business 12 years ago, Tom has become a frequent international flier and rarely stays in one place for long. "You know how I do my business,"

he says. “I get up late during a day, make phone calls and run some errands in the afternoon, meet with my clients at night, and we drink till morning.”

Tom just finished with a divorce lawsuit after a two-year marriage; he ended up paying nearly \$2 million in alimony to his ex-wife. He admits that it is difficult to maintain a normal family life with his work. He says he has a luxury three-story house in southern Taiwan, but no one is waiting for him when he goes back home.

The complications of his personal life apart, Tom says he has mixed feelings about the pollution in Guiyu. “I was feeling kind of bad for Guiyu people,” Tom says, “so I ended up importing more scrap metal waste and less electronic waste.” He claims that scrap metal causes less pollution during the recycling process.

“When I make enough money” Tom says, “I will quit and go back to school to teach.”

Baby steps

Robin Schneider, director of Texas Campaign for the Environment, walks into a Wal-Mart store in South Austin. She winks at a young woman, not a store employee or a customer, who is walking toward her from the clothing department; the girl nods slightly and disappears at the entrance gate. Later, the girl leads four people in all-black clothes with a black paper box on their heads walk into the store. They are protesters wearing Halloweenish zombie make-up. Giant words on the TV-shaped paper box reads common electronic brands “LG” and “VISIO.”

“There is no TV recycling match at Wal-Mart!” one protester shouts. “Recycle like Best Buy to get on the track!”

Schneider says her campaign, part of a grassroots nonprofit organization with a special focus on electronic waste, is aimed at pressing Wal-Mart to take back used electronics from consumers for proper recycling. She says that giant retailers such as Wal-Mart need to participate in the recycling-collecting infrastructure statewide. Schneider believes that, while increasing e-waste collection points is important and convenient for consumers, the responsibility of recycling e-waste properly has to be mainly on the producers’ side.

“If producers are willing to recycle their end-of-life products, they would be more careful how they recycle in order to protect their brand reputation,” Schneider says. However, no U.S. law requires producer responsibility. Many companies recycle voluntarily, and some states require it, including Maine, New Jersey and Texas.

In the past few years, Schneider and her campaign were involved in pressuring Texas-based electronics producer Dell to take back its obsolete products. Dell launched a take-back program that partners with Goodwill Industries in 2004. The program’s website says the effort is not exporting waste or sending any environmentally sensitive materials to landfills.

In April of this year, Dell announced in a press release that the company collected about 150 million pounds of discarded technology in fiscal year 2011, a 16 percent increase over the previous year.

John Pflueger, principle environmental strategist at Dell, says in an interview that whenever the company takes back assets, they check to see if the system or any individual component can be reused. If the individual parts can’t be reused, the materials will be sent to a certified recycler.

Dell would not disclose which certified recycler it works with.

Asus, a Taiwan-based computer manufacturer, has different views on producer responsibility. “We think it is a bit harsh on us to make it all [the] producers’ responsibilities,” says Chris Li, senior auditor for a committee at Asus supervising e-waste. Asus started a free take-back program in the U.S. in 2006.

Li says it is still difficult to control where the products will go after they are sold. Consumers can donate their old electronics to anybody they want.

He recalls when he went to Guiyu a couple of years ago on an inspection project for Asus, it was “unbelievable to witness the burden placed on this small town.” But he believes that what a producer can do about e-waste is limited. Other than e-waste from the consumer’s end, downstream manufacturers in China also produce a huge amount of e-waste themselves during the process of making products. “They are the ones who take care of their e-waste, not the brand companies,” Li says.

Environmentalists, on the other hand, believe that lax regulation of electronic waste in the U.S. and worldwide has contributed to the problem in the towns like Guiyu. The Consumer Electronics Association predicts that average American consumer will spend \$246 on electronics gifts this holiday season, a 6 percent increase from last year and an all-time high. Fast-paced global consumerism means new electronic gadgets pop into the market every six months, and there is still no federal mandate for electronics recovery.

In Texas, a recycling law passed in 2007 requires makers of computer equipment (except TVs) to develop and implement recycling plans. Currently, 78 manufacturers representing 123 brands are participating in the program, according to the Texas Commission on Environmental Quality. Yet only 14 recyclers in Texas have third-party certification.

Last year, the U.N. released a report calling for new recycling technologies and regulations to safeguard both public health and the environment. It warns that unless action is stepped up to properly collect and recycle materials, many developing countries face living under the specter of hazardous e-waste mountains, with serious consequences for the environment and public health.

“China’s lack of a comprehensive e-waste collection network, combined with competition from the lower-cost informal sector, has held back state-of-the art e-waste recycling plants,” the report says.

Jim Puckett of Basel Action Network, which developed the e-Steward standard, says it’s been hard to get the message out to Americans, and this is a problem. “There is not a magical disappearing hole when you throw things away,” he says. “You need to think about where it goes.”

VITA

I-Hwa Cheng was born in Kaoshiung, Taiwan. She completed her undergraduate degree in English Literature, and Linguistics at Providence University, Taichung, Taiwan in 2005. She was employed as assistant editor at the financial news TV station Unique Satellite TV in 2006 and later worked as news editor at the financial news website CNYes.com for two years from 2007 to 2009. In September 2009, she entered the Graduate School at the University of Texas at Austin.

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