

The IT Industry Has a Critical Duty to Prevent Heavy Metal Pollution

Friends of Nature Institute of Public and Environmental Affairs Green Beagle

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Project Background: Heavy Metal Pollution Severely Threatens Eco-Environment and Public Health

In 2009, a number of heavy metal pollution incidents, which occurred in Liuyang and Wugang of Hunan, Fengxiang of Shaanxi, Shanghang of Fujian, Jiyuan of Jiangsu, Yancheng of Jiangsu, and Qingyuan of Guangdong, shocked the country. According to the statistics of the Environmental Protection Ministry, in 2009, in the 12 cases of heavy metal pollution the Ministry received, blood level of lead in 4,035 people and the blood level of cadmium in 182 people were excessive, which led to 32 mass incidents.¹

On these incidents, a China Environmental News newspaper commentator pointed out: "These pollution events are only the tip of the iceberg of heavy metal pollution problems. Due to the long term accumulation and lag in treatment, right now our country is facing serious threats of mass outbreaks of heavy metal pollution problems." ² In 2006, the head of the National Environmental Protection Administration discussed the general state of China's soil pollution and disclosed an estimate that the amount of the nation's grains polluted by heavy metal reached 12 million tons per year, with direct economic losses of more than 20 billion yuan. This environmental pollution threatens the ecological environment, food security, public health, and the development of sustainable agriculture.³

The national government has taken the harmful effects of heavy metal pollution very seriously, and strengthened its administration and management in 2009. On April 10, 2010, in a teleconference on regulating illegal industrial discharge to protect the public health and environment, the State Council reiterated the need to further increase corrective measures on industrial heavy metal discharge violations and to check on

¹ <http://www.chinanews.com.cn/cj/cj-hbht/news/2010/01-25/2090643.shtml>.

² <http://green.sohu.com/20091225/n269200918.shtml>.

³ http://news.xinhuanet.com/environment/2006-07/19/content_4852888.htm.

heavy metal incidents that happened so frequently.⁴

As environmental organizations, we fully support the supervision and regulation of government agencies over the problems of heavy metal pollution. At the same time we believe that heavy metal pollution is the cumulative result of many years and involves numerous industries and a large number of enterprises. The effort to overcome heavy metal pollution's direct damage to public health requires broad participation from society. We conducted this investigative study in order to encourage IT industries to take environmental responsibility, strengthen the environmental management over their supply chains, and further progress green production through green purchasing.

Industries involved in heavy metal discharge include: mining, smelting and metallurgical industry, chemical industry, textile printing and dyeing, leather tanning, pesticides, animal feed manufacturing, electroplates, and batteries, etc.. This investigation focused on IT product manufacture-related heavy metal discharge, especially the battery industry relating to the production of IT products and the electroplate industry relating to printed circuit board (PCB) production. China is undeniably the world factory for IT industries with around fifty-percent of the world's computers, cell phones, and digital cameras manufactured in China. Nevertheless, as the center of the world's IT product manufacturing, China faces huge environment pressure. Among all the negative impacts of heavy metal discharge, heavy metal pollution should be taken very seriously.

In view that IT product manufacturing is a source of heavy metal pollution, Friends of Nature, the Institute for Public and Environmental Affairs and Green Beagle decided to start an investigative study of this industry to promote this fast-growing industry towards enhancing heavy metal discharge control measures.

Major Findings of the Investigation are as follows:

I, Some IT enterprises have violated heavy metal discharge standards and have caused serious pollution.

Take the printed circuit board (PCB) production as an example. In the process of electronic plating and copper foil etching of the board, the wastewater contains

⁴ http://myrb.newssc.org/html/2010-04/10/content_895950.htm.

major pollutants such as total copper, as well as the Category I pollutants such as nickel and chromium.

These heavy metals can cause the following harms:

Copper

There are many biological effects from copper toxicity. A copper concentration of 0.01 mg/L can inhibit water self-purification; at a concentration of 0.0002 mg/L, water starts to become toxic for fish. Copper can remain in soil, so sewage irrigation or sludge fertilizer could easily lead to soil pollution, hinder root development, and inhibit nutrient absorption and growth. Copper toxicity also affects aquatic organisms; in coastal and harbor areas the presence of copper once caused green oyster events.

An epidemiological survey found that areas where drinking water contains high level of copper are correlated with high rates of deaths from cardiovascular problems. Symptoms of acute copper poisoning include: low blood pressure, vomiting, melena, jaundice, hemolytic anemia, and coma to death.⁵

Nickel and Nickel Compounds

Nickel is recognized as a human carcinogen. Those who get exposed to nickel dust or nickel steam will have respiratory inflammation, dermatitis, leukocytosis, nasal cancer, lung cancer and other illnesses. According to field investigation, most scholars believe that the high incidence of cancer is correlated with nickel sulfide, nickel oxide and nickel carbonyl content.⁶

Chromium

Chromium is a poisonous carcinogen. There are two major valence states of chromium: trivalent chromium (Cr III) and hexavalent chromium (Cr VI). Chromium VI is far more toxic than chromium III, which unlike chromium VI, occurs naturally in the environment. Chromium VI chiefly affects the respiratory tract from inhalation and acute exposure causes coughing and wheezing. In cases of chronic exposure, chromium VI can cause perforations of the septum, bronchitis, pneumonia, decreased pulmonary function, and risk of lung cancer. Epidemiological studies have shown that chromium VI is a carcinogen when inhaled. Non-cancerous effects include dermatitis and ulceration of the skin from skin exposure, and gastrointestinal problems.⁷ Chromium can kill microorganisms in water and restrain the self-purification process of the water.

⁵ Shi Biqing, Zhaoyu, Lu Zhenhua, Environmental Pollution and Human Health, China Environmental Press, August 2008

⁶ Shi Biqing, Zhaoyu, Lu Zhenhua, Environmental Pollution and Human Health, China Environmental Press, August 2008

⁷ Shi Biqing, Zhaoyu, Lu Zhenhua, Environmental Pollution and Human Health, China Environmental Press, August 2008

In the investigation, we found that a large number of PCB manufacturers have not been able to sustain compliance with discharge standards. For example, in Shenzhen City where PCB production was concentrated, the municipal law enforcement inspection shows that in 2008 the plating circuit board industry audit compliance rate was not high enough. Some plating circuit board enterprises' wastewater treatment and discharge of pollutants exceeded standards despite repeated prohibitions; and from time to time, some enterprises made efforts to get false compliance.⁸

Also in 2008, In Dongguan City where IT industry is also concentrated, 41 PCB companies were inspected for their approval and acceptance of environmental protection, generation and disposal of hazardous waste, and pollution control facilities. 27 of the 41 companies violated the "Three Synchronies" requirements, illegally transferred hazardous waste, and/or had poorly operated pollution control facilities, all of which were handled in accordance with the law.⁹

Still in 2008, Guangzhou Municipal Environmental Protection Bureau and Guangzhou Municipal Supervision Bureau jointly listed 37 circuit board factories in Zengcheng City as factories that needed intensive supervision and rectification. Zengcheng City extended the scope to 54 PCB factories during the implementation of the municipal requirements.¹⁰

PCB enterprises have exceeded wastewater and emission standards and have consequently caused serious environmental pollution. In 2008, when commenting on the causes of Danshui River pollution, the local government of Huiyang District, Huizhou City, pointed out: "Presently, the Danshui River's pollution comes from industries in electroplating, tannery, printing and dyeing, circuit boards and other heavily polluting enterprises. They exceed wastewater discharge standards, have old facilities, have eroded workshop floors, have complex pipeline and wire systems, and lack environmental records. Therefore it is difficult to implement stable pollution control measures and to reach wastewater discharge standards."¹¹

In September 2009, the "Shenzhen Evening News" reported: According to the Shenzhen Urban Residential Environment Committee, some rivers still suffer from

⁸ <http://news.sina.com.cn/o/2009-09-24/064116348716s.shtml>.

⁹ <http://www1.dg.gov.cn/publicfiles/business/htmlfiles/dgepb/jczf/200903/136024.htm>.

¹⁰ http://epaper.nddaily.com/A/html/2008-10/06/content_589686.htm.

¹¹ <http://www.huiyang.gov.cn/display.asp?articleid=19781>.

heavy metal pollution, chiefly caused by plating circuit board factories that secretly discharged wastewater. The Longgang River and Pingshan River areas in Shenzhen also occasionally exceeded heavy metal level standards, resulting in trans-boundary pollution disputes. Some areas had an increase of heavy metals in soil and although the levels were still within the state soil quality standard, they did not accord with the standards for human inhabitation. Due to the excessive levels of heavy metals in the incoming wastewater, some sewage treatment plants could not effectively treat wastewater, which had a direct impact on the city's pollution reduction efforts. The report quoted the head of the Urban Residential Environment Committee who said that heavy metal pollution was a major hazard in the city; it severely damaged the city's environmental quality and endangered the city's environmental safety.¹²

The Annual Report of Marine Environment of Guangdong Province shows that in 2008, the Pearl River, the Shenzhen River and other rivers discharged more than 12,000 tons of heavy metals and arsenic into the sea.

Table I 2008 River Run-off of Major Pollutants into the Sea in Guangdong Province (tons)¹³

River Name	COD _{Cr}	Nutrients	Oil	Heavy Metals	Arsenic	Total
Pearl River	1550000	68100	40200	8813	3760	1670873
Rong River	7337	506	173	85	2	8103
Shenzhen River	1659	2674	58	14	3	4407

Nearly six years of monitoring showed that almost all coastal waters of Guangzhou, Dongguan, and Zhongshan cities had been seriously polluted, and waters west of Shenzhen and near Zhuhai had also been heavily polluted. The ecological system in the Pearl River Estuary under ecological monitoring had already been in an unhealthy condition. Higher than normal levels of heavy metals existed in some organisms and the pollution also created significant changes in habitat, and caused

¹² <http://news.sina.com.cn/o/2009-09-24/064116348716s.shtml>.

¹³ The Annual Report of Marine Environment of Guangdong for the Year 2008, Guangdong Province Oceanic and Fishery Bureau, April 2009

some abnormalities in organisms' composition in the biological community¹⁴.

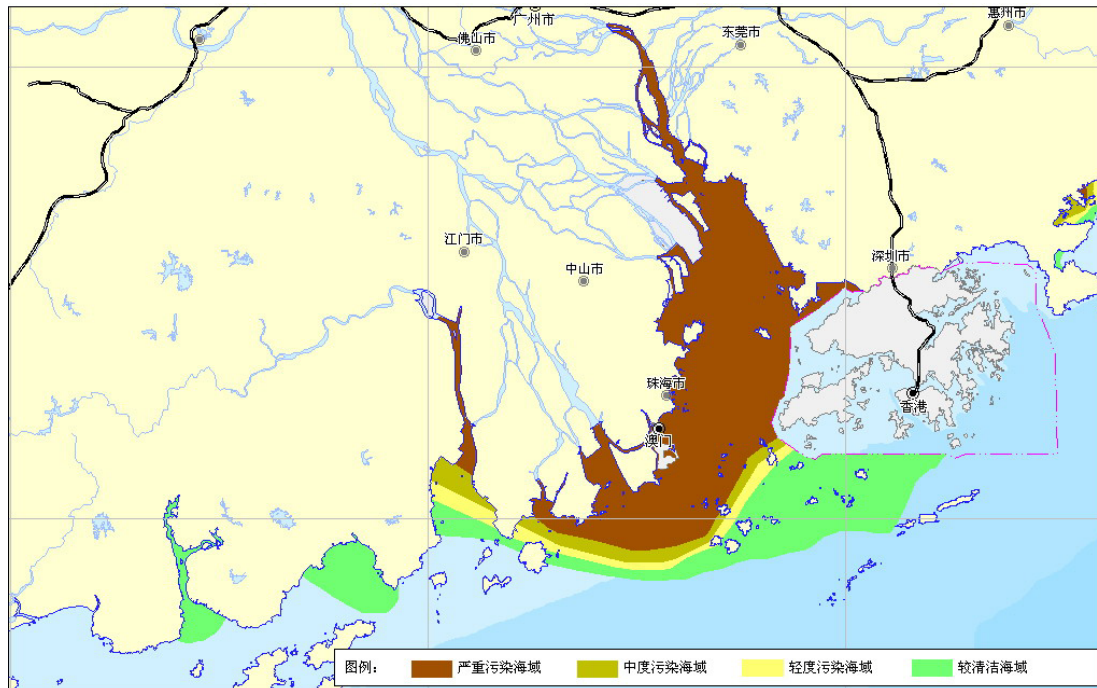


Figure 1: Pearl River Estuary coastal water pollution diagram¹⁵

The battery and power supply industry is indispensable for the IT industry (especially the telecommunications industry) and the major heavy metal involved is lead. Lead is a kind of toxic metal that can accumulate in the human body, and in animals and plants. Lead persists for a long time in the environment, and emissions will lead to severe air, water and soil pollution, and animal and plant pollution.

Lead hazards are as follows:

1. Lead is a kind of toxic metal that can accumulate in human body and in animals and plants. Its main toxic effects are anemia, nerve dysfunction and kidney damage. Lead affects the safety of aquatic organisms at a concentration of 0.16 mg/L.¹⁶

2. Lead has no physiological function in human body; the ideal blood lead level should be zero. Low concentrations of the lead in the body will harm normal cells, and lead molecules in the blood interfere with normal nerve cell function. Lead destructs hemoglobin in the blood and the survival of cerebral microvasculature. Its accumulation in the brain has particularly severe

¹⁴ The Annual Report of Marine Environment of Guangdong for the Year 2008, Guangdong Province Oceanic and Fishery Bureau, April 2009

¹⁵ The Annual Report of Marine Environment of Guangdong for the Year 2008, Guangdong Province Oceanic and Fishery Bureau, April 2009

¹⁶ Environmental Monitoring, Higher Education Press.

impacts: in early brain development (such as the embryonic period), it can lead to mental retardation and affecting human brain function.¹⁷

3. Contact with excessive lead and inorganic lead compounds can cause damages to nerve, digestive, and hematopoietic systems. Lead poisoning symptoms include: headache, insomnia, bone and kidney damage, anemia, miscarriages in women, and general systematic symptoms. Child lead poisoning causes delayed brain development or acute brain problems.¹⁸

With regard to the main sources of lead pollution, in addition to leaded gasoline, car exhaust, metal smelting, and waste materials recycling and smelting, lead-acid battery production is an undeniable source of pollution. In 2009, the lead poisoning and high blood lead level cases in Shanghang, Fujian Province, Dafeng of Yancheng, Jiangsu Province, and Qingyuan, Guangdong Province were all related to the production of batteries. Because the IT industry, especially the telecommunications industry, uses lead-acid batteries as power source, lead-acid battery production and lead smelting are an integral part of their production chain.

II, Some Well-known IT Brand Suppliers Violate Heavy Metal Discharge Standards

By retrieving corporate violations of wastewater discharge standards through the China Water Pollution Map and the China Air Pollution Map, we found that a number of suppliers of some well-known IT brands have exceeded heavy metal discharge standards and have become heavy polluters.

Among the PCB manufacturers, the monitoring record for the Huizhou Merix Electronics Technology Co., Ltd. shows: "On March 3, 2009, during the on-site inspection our law enforcement officers found that your company does not discharge wastewater in accordance with regulations, but directly discharges some untreated wastewater. Wastewater monitoring sample results show: pH level is 5.6 units lower than the acidity standard, chemical oxygen demand exceeded the standard by 96.9 times, suspended solid particles exceeded the standard by 32.5 times, copper exceeded the standard by 5199 times, zinc by 3.9 times, nickel by 9.6 times, total nitrogen by 8.6 times, ammonia by 24.7 times and iron exceeded by 178.2 times, causing severe

¹⁷Qian Hua, "The Sources of Lead Pollution in Environment and Their Impact on Human Health," Management and Techniques in Environmental Monitoring, 10.6 (1998).

¹⁸Shi Biqing, Zhaoyu, Lu Zhenhua, Environmental Pollution and Human Health, China Environmental Press, August 2008

environmental pollution.”¹⁹

Merix Huizhou’s U.S. parent company is the NASDAQ-listed Merix Corporation. Merix’s 2008 annual report lists Cisco and Motorola as two of its largest corporate customers: “Two of our largest customers, Cisco and Motorola, accounted for 11 % and 10%, respectively, of our net sales in fiscal 2008.”²⁰

Let us look at another PCB manufacturer: Wannianfu Electronics Co., Ltd. in Dongguan. October 31, 2009 at 2 am, according to public report, the Sub Bureau of Environmental Enforcement and Publicity and Education Center formed a law enforcement working group, and conducted a surprise inspection on Wannianfu Electronics Co., Ltd. The on-site inspection on the company’s wastewater treatment facilities indicated that the company did not have normal operation of its wastewater treatment facilities, with the dosage control system and belt filter idle. The company arbitrarily set a hose of 10 cm in diameter to connect to the sludge concentration reserve tank, circumvented the standard channel but directly discharged the untreated sludge and wastewater through the hose into the sewers. On-site sewer manhole covers were forced open and revealed that the sewer drains were filled with sludge and untreated wastewater. According to the company’s wastewater treatment staff, they discharged about six cubic meters of untreated sludge from the sludge concentration tank. On-site detection of the pH level showed the pH value of wastewater in the wastewater treatment tank to be about 2 to 3. Meanwhile, according to the careful calculation of the company’s water volume, hazardous waste, and the usage of online monitoring system, the company had four other problems: they are unable to explain how and where they discharge 350 tons of wastewater per day; illegally transferred spent etching solution and sludge; did not regularly use online monitoring system, failed to properly arrange the wastewater treatment pipelines and therefore lead to a potential risk of secret wastewater dumping²¹. In 2006 and 2007, respectively, this company was also investigated and punished by environmental protection agencies due to its violation of environmental rules.²²

In the end of the January 2010, the Department of Environmental Protection of

¹⁹ <http://www.ipe.org.cn/bdbq/gyqyinfo.jsp?ID=38556>

²⁰ Merix Corporation Annual Report 2008 .

²¹ <http://www.ipe.org.cn/bdbq/gyqyinfo.jsp?ID=45163>

²² <http://www.ipe.org.cn/bdbq/gyqyinfo.jsp?ID=28492>
<http://www.ipe.org.cn/bdbq/gyqyinfo.jsp?ID=19289>

Guangdong Province announced a list of the enterprises that need to carry out environmental rectification under intensive supervision in 2010. The 20 enterprises under supervision included three PCB plants that belonged to the Hong Kong listed company Kingboard Chemical Group Co., Ltd. (KINGBOARD CHEM148), including Wannianfu Electronics Co. Ltd²³. The companies under another Hong Kong-listed company, Kingboard Laminates Holdings Ltd., that belongs to the afore-mentioned Kingboard Group also have a number of records of violations. One of them is Guangzhou Kingboard (Nansha) Petrochemical Company Ltd.. In May 2009, Guangdong Provincial Oceanic and Fishery Administration announced that for two consecutive years the said company exceeded discharge standards and contributed to pollution of the Pearl River.²⁴ The Guangzhou Environmental Protection Bureau listed the company on the 2009 corporate environmental supervision list.²⁵

Some openly available data shows that sales of Kingboard Group PCB rank high in Asia and IBM and Intel were cited as two of its many customers.

Let us look at the battery and power suppliers. Public documents show that the Jiaoyang Huaqiang Battery Factory whose pollution caused excessive blood lead levels in 121 children at Shanghang County, Fujian Province, in September 2009 is part of the supply chain for a number of well-known international brands.

According to the “Prospectus of Initial Public Offering and Listing on the GEM Market” by Zhejiang Narada Power Source Company Limited,²⁶ which was listed on April 21, 2010, for nearly three years, Shanghang Huaqiang Battery Factory has been the company’s most important OEM manufacturer in its lead products.

²³ <http://www.ipe.org.cn/bdbqy/gyqyinfo.jsp?ID=44296>,
<http://www.ipe.org.cn/bdbqy/gyqyinfo.jsp?ID=44283>,
<http://www.ipe.org.cn/bdbqy/gyqyinfo.jsp?ID=44289>,

²⁴ <http://www.ipe.org.cn/bdbqy/gyqyinfo.jsp?ID=24425>.

²⁵ <http://www.ipe.org.cn/bdbqy/gyqyinfo.jsp?ID=37227>

²⁶ http://pg.jrj.com.cn/acc/CN_DISC/STOCK_NT/2010/04/20/300068_Is_57835953.PDF

(6) 公司 OEM 委托加工及装配情况

① 报告期内，公司向各 OEM 厂商委托加工情况如下：

期 间	OEM 厂商名称	委托加工 产品	数量	金额 (万元)
2009 年度	武汉长光电源有限公司	电池	3.48 万 kVAh	1,406.40
	上杭华强电池有限公司	铅制品	20,803.25 吨	30,306.92
	安徽海容电源动力有限公司	铅制品	3,459.97 吨	5,250.79
	圣豹电源有限公司	铅制品	942.22 吨	1,403.44
	赣州南鹰电源有限公司	铅制品	2,205.68 吨	3,825.08
	合 计	—	—	42,192.63
2008 年度	武汉长光电源有限公司	电池	2.18 万 kVAh	1,280.76
	圣豹电源有限公司	电池	24.71 万 kVAh	13,397.33
	上杭华强电池有限公司	铅制品	21,396.35 吨	37,218.80
	安徽海容电源动力有限公司	铅制品	773.74 吨	1,181.67
	合 计	—	—	53,078.27
2007 年度	武汉长光电源有限公司	电池	0.07 万 kVAh	41.84
	上杭华强电池有限公司	铅制品	4,851.34 吨	11,011.73

126

	合 计	—	—	11,053.57
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注：上述 OEM 商与发行人均无关联关系。

(Figure 2 The outsourcing of Zhejiang Narada Power Source Co. Ltd to its OEM suppliers) ²⁷

Narada Power Source Company Limited claims on its website that: “Narada set up companies in Singapore and the UK, so as to show its image to the world. The Company has joined the supplier systems of such well-known international corporations such as Vodafone, Alcatel-Lucent, Nokia, Siemens, Motorola, Singapore Telecom, and British Telecom, and has received the ‘Global Outstanding Supplier Award’ selected by Alcatel and other corporations.”

²⁷ “Prospectus of Initial Public Offering and Listing on the GEM Market” by Zhejiang Narada Power Source Company Limited



Figure 3: Narada Power Source Company Limited's website, "about us"²⁸

III, Some Well-known IT brands Have Not Responded to the Questions regarding Their Suppliers' Heavy Metal Pollution

After discovering the relationships between the famous IT brands and their suppliers that exceeded discharge standards and violated regulations, on April 15th and 16th²⁹ of 2010, we wrote to the CEOs of 29 IT companies.

The letters first explained that we are writing as 34 environmental NGOs in China, and in our efforts to reduce pollution and protect the environment we are particularly concerned with the environmental performance of enterprises. We then informed the company that through our research we found that a number of businesses violated environmental regulations and were publicized or punished by environmental protection agencies; we also provided links related to the violations of regulations for their review. We then provided the relevant materials that showed that these supplier companies were part of the said company's supply chain.

We then requested answers to the following questions:

²⁸ Snapshot of Narada Power Source Company Limited's website,

²⁹ Due to delay in obtaining their headquarters' contact information, the letters to Vodafone and Philips were not sent out until April 21, 2010.

1. Are the above enterprises your company's suppliers?
2. If the enterprises are your suppliers, have you been aware of their environmental violation records?
3. If you have been aware of their violations, what measures have you taken to remedy them? If you have not been aware of the violations, then, after receiving the letter, what kind of measures or action will you prepare to take?
4. Do you have any other suppliers that have problems with environmental compliance?
5. Do you have environmental standards for your suppliers? Have you established an environmental management system for your supply chain?

The last part of the letter stated: given that the aforementioned non-compliance suppliers are likely to involve the use and discharge of heavy metals or other toxic substances, we hope your company will seriously investigate the situation and respond to our questions in a timely manner.

After receiving this letter, some companies responded in a timely manner for a follow-up, and some companies only partially responded. Of these companies, Panasonic was the first to respond and has started more in-depth communication. Japan's Sanyo, Hitachi, and Sony, China's Haier and Lenovo, the United States' Intel, and Singapore's SingTel also directly communicated with environmental organizations.

Within these companies, the Japanese company Panasonic, Sanyo and Chinese companies Haier and Lenovo were the most active in responding to our questions.

- Panasonic not only did a rather deep investigative check on the supplier list provided by NGOs, but that they had began to use the database to screen their first tier suppliers. The Director of Environment Promotion Department of Panasonic China also made a direct communication with environmental groups, discussing about how to enhance cooperation with various stakeholders and establish a mechanism to improve environmental supply chain management.
- Sanyo China contacted us by phone many times, saying that the headquarters considered this matter very important and ordered Sanyo China to carry out a verification. Afterwards the headquarters of Sanyo sent a written explanation, confirming the verification. They also said they would follow up on problems with suppliers. One of its suppliers also started communications with NGOs.
- Haier contacted us by phone, and not only did it confirm our questions, but had already followed up with supplier company who had exceeded environmental standards. Specifically the company stated that Haier's purposes were in line with environmental organizations and that they would like to jointly promote environmental protection.

- Lenovo carried out a written notification, although they said the company violator were not their suppliers, they still expressed willingness to work with public organizations on the existence of other suppliers that have environmental compliance problems and said they would have further communication on environmental supply chain management mechanisms.

However, most companies have not given any type of response³⁰. The responses of the enterprises can be seen on the following table:

Table II The Responses Made by 29 IT Brands by April 26, 2010

Company Name	Reply to NGO letter	Under-stands the purposes of the study	Conduct checks on Supplier violation cases		Use public information to enhance supply chain management	
			Initial checks	In-depth checks	Consider establishing a search mechanism	Decided to establish a search mechanism
Panasonic	✓	✓	✓	✓	✓	
Haier	✓	✓	✓			
Sanyo	✓	✓	✓			
Lenovo	✓	✓	✓			
Sony ³¹	✓		✓			
Hitachi	✓	✓				
Sing Tel	✓	✓				
Intel	✓	✓				
Philip	✓					
Nokia	X					
Ericsson	X					
Siemens	X					
Alcatel-Lucent	X					

³⁰ Companies failed to respond is not listed in particular order

³¹ Sony replied to environmental NGOs' letter on April 19, 2010, claiming that 10 companies listed in the letter that violated environmental regulations are not its "direct suppliers." The environmental NGOs questioned its reply; but Sony has not replied again yet.

Vodafone	X					
British Telecommunication	X					
IBM	X					
Cisco	X					
Motorola	X					
Apple	X					
HP	X					
Canon	X					
Seiko Epson	X					
Toshiba	X					
Sharp	X					
Samsung	X					
LG	X					
TCL	X					
BYD	X					
Foxconn	X					

Major Suggestions: The IT Industry should use Information Disclosure to Enhance the Environmental Management of Supply Chains

As an integral part of strengthening environmental protection, since 2003 the Chinese government has promulgated a series of laws and policies to promote the disclosure of environmental information and public participation. The Chinese public's environmental awareness has continuously increased, the capacity of environmental organizations has been strengthened, and enterprises have started to realize the significance of environmental protection. All these aspects lay a foundation for solving environmental pollution problems through extensive cooperation in the public and private sectors.

By collecting and collating environmental monitoring data issued by government agencies at various levels, the Institute of Public and Environmental Affairs has established a national water pollution and air pollution database. Up to April 2010, it has included 60,000 entries of standard violations by enterprises across the country since 2004. In 2008, 21 environmental NGOs formed the Green Choice Alliance (GCA) to promote the regulation of large retail enterprises over their suppliers. Presently, 34 environmental groups have joined GCA. By using the database search engine, large enterprises can easily access the information about suppliers and their violations of environmental regulations publicized by government agencies. Currently, GE, Nike, Wal-Mart, Esquel, Unilever and other large enterprises have started to use the database to advance the environmental management of their supply chains. Through regular comparison and inquiry by customer companies, many suppliers with violation records have felt the pressure to take corrective measures and make public disclosure about the results.

However, the IT industry that provided critical support to information transparency, has become a laggard in using information disclosure to promote environmental protection. Up to the present, no leading enterprises, including many famous IT brands, are willing to commit to effective environmental management of the manufacturing processes of their supply chain. In the early exchanges with some of the brand companies, they were indifferent to the potential environmental damages caused by their suppliers. One company even said: We have 5,000 suppliers; it is "too much trouble" to compare that with publicly available records of violation. But will going through the suppliers in the database today be more troublesome than having the

surrounding communities suffer from heavy metal pollution for generations? Will demanding the suppliers to control heavy metal emissions today be more troublesome than cleaning up the heavy metal sediment that is deposited in our rivers, soil, groundwater, and coastal waters in the future?

We hope that this report will help the IT industry take their suppliers' heavy metal discharge more seriously, respond to public questions, and carry out thorough inspections and make feedback. More importantly, we hope this report can help encourage IT enterprises to establish a long-term management system and assert strict control over their supply chains' emissions and discharge of heavy metal pollutants. Given that many IT brands only know first tier supplier information, which could be limited in numbers and could even be trading companies, and given that many high polluting production processes include extensive subcontracting, we propose that the IT brands first figure out the exact supplier enterprises in their own large and complex supply chain.

At the same time, we believe that IT brands should promote the expansion of their suppliers' public information disclosure and place them under public pollution supervision. We hope that IT brands can urge their suppliers that discharge heavy metal pollutants to strictly observe the 2010 State Council's call to punish companies that illegally discharge pollutants so as to protect public health, and take specific environmental protection measures, such as: "establish account books for pollution generation and discharge and daily monitoring system, make regular reports of monitoring results, and publicize situations such as the discharge of heavy metal pollutants."

We also hope that based on this investigation we can conduct the second phase of green choice consumer action in 2010, so as to raise consumers' awareness of pollution control in the production of IT products. We also hope to encourage consumers to use their purchasing power to strengthen the IT industry's environmental management of its supply chain, and promote green production of IT products through green consumption.

***Note: This report is a translation of the Report in Chinese. In case of any discrepancies, the original version in Chinese shall prevail.**

Appendix Table I³²

NGO Members of Green Choice Alliance	
1	Friends of Nature
2	Global Village Beijing
3	Green Earth Volunteers
4	Global Environmental Institute
5	Huai River Water Living Circumstance Scientific Research Center
6	Gansu Green Camel Bell
7	Friends of Green in Tianjin
8	Beijing Promotion Association for Sustainable Development
9	Center for Legal Assistance to Pollution Victims
10	Chongqing Green Volunteer Federation
11	Nanjing Green Stone Environmental Action Network
12	Nature Watcher Volunteer
13	Hubei Green Hanjiang
14	Environment Protection Commonwealth Association
15	Xinjiang Conservation Funds
16	Hebei Green Friend Association
17	Yunnan Green Watershed
18	Wenzhou Green Eyes
19	Wild China
20	Green Island
21	Green Beagle
22	Shanghai Oasis Ecological Conservation and Communication Center
23	Volunteers Association of Red Phoenix Project in Shaanxi
24	Friends Of Green Environment
25	Green Longjiang
26	Green Anhui
27	Green Zhujiang
28	Green River
29	Dalian Environmental Resource Center
30	Center for Rural Development and Biodiversity Protection of Lanzhou University
31	South China Nature Society
32	Green Kunming
33	The Youth Environmental Association in Chongqing
34	Institute of Public and Environmental Affairs

³² NGO members are not listed in particular order