

Exports of Scrap Electronics – Situations, Principles, and Standards



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The purpose of this draft White Paper on Electronics Exports is to solicit debate and comments and promote dialogue. The goal is to develop a better set of standards for the practices of Reuse, Export, Trade and Recycling. Our business is to reduce mining and extraction, and to promote the sharing of quality secondhand equipment, without turning other nations into dumping grounds for useless junk.

Please submit comments to exports@retroworks.com

1.0 The Situation:

Consumers in the West demand new products and services, which demand a large portion of the world's fossil, mineral, and renewable resources. The focus of this paper is on Western demand for electronic products containing non-ferrous metals, such as lead, copper, gold, and palladium, and on recycling services to remove those materials when the consumer upgrades.

Just as the United Nations Conference on Trade and Development (UNCTAD) used lead acid battery recycling¹ practices to focus discussion on recycling in general, this paper will focus on a few examples, such as leaded glass CRT monitors, to illustrate problems and practices. CRT monitors are easily identifiable, are specifically banned from disposal in Massachusetts and California, and are difficult to recycle. Demand for replacement monitors is also relatively simple to project.

Americans are expected to buy 50,000 new monitors next year². Monitors are now 35% of the entire computer cost, and about half of the computer's weight. The largest part of a traditional monitor is leaded glass; monitors also contain lead solder, copper wiring and plating, silver, palladium and a small amount of gold. Based on demanufacturing of past monitors, we estimate that manufacturing those 50,000 new monitors will require between 1-2 million pounds of copper, gold, palladium, leaded glass and silver. Some of those materials (particularly free lead) are extremely toxic in themselves, while others (such as gold) are separated from mining ore or scrap using toxic processes (cyanide baths, for example). *Those materials are primarily supplied through mining, but increasingly through recycling of products such as wire and used electronics.*

Today, most of the computer monitors sold in Western nations are *replacements* for old monitors and computers, deemed "obsolete" by the consumer (such as monitors which have lost color, have loose power connections, or at 14 inches are just too small and too low resolution for the US market).

For the sake of example, let's say that 10 monitors are manufactured in Asia to replace 10 in the US market. Old monitors were once stored in attics or thrown in the trash, but these 10 are now turned in to a recycling program.

Of the 10 "end of life" monitors, statistically, at least 1 is probably worth fixing and reselling in the US (17 inch SVGA's 1996 and newer). At least 2 more can be fixed or reused in countries with cheaper techs and lower cosmetic standards. The remaining 7 should be recycled back into leaded glass, copper, gold, ABS plastic, etc.

The process of separating monitors back into individual components involves demanufacturing and sending individual components thousands of miles to different processing destinations. At those locales, the materials can be prepared for use in

¹ http://www.unctad.org/trade_env/docsbangkok/Draft%20report.doc link to Report of the Workshop on Building National Capacity in Rapidly Industrializing Countries on Sustainable Management of Recoverable Material/Resources
² source, IDC <http://www.sid.org/displaytechnologies/reports/sid2000keynote.pdf>

place of mined materials to manufacture new electronic products, by companies in Asia which either source from both mine-based smelters and secondary scrap smelters.

The problem with recycling is that many of the individual scrap components, and especially CRT glass, are expensive to process and ship. Without a plan and a market for each component, some components become “speculative accumulation”, and ultimately abandoned waste. Simply put, a processor without “Environmentally Safe Management” (ESM) practices can pull the goldfingers out of monitors, find a market for the plastic, and leave the CRTs on the ground.

This does happen, and in the developing world, it gets very ugly. Some groups have called for Rich nations to stop exporting used electronics³ and advocate self-reliance. For the 7 unrepairable monitors which are banned from disposal in MA and CA, it is difficult to argue that leaded glass will be better recycled overseas⁴. Most state-sponsored CRT recycling programs ban that practice.

But *after* the monitor is processed, what about the copper yoke, or degaussing coil? Other scrap materials, such as processed copper, steel, baled paper, are the #1 export by volume from the United States – surpassing even wheat and automobiles. For the consuming (importing) nations, the only alternative to recycling has been foresting⁵ and mining.

Meanwhile, the wealthy nations are better at disposal than they are at repair⁶. Truly repaired items are not “wasted”, nor are manifested loads of copper, steel, silver and gold scrap (assuming the scrap has a higher chemical percentage of material than the mined material). Basel Action Network agrees that this practice can be allowed if the processing method is clean (e.g. no burning wire casings).

So for those of us who have strong environmental and social principles, is “exporting” simply a bad practice? Or can it be improved if we begin to draw lines, and establish better standards? To simplify discussion, let’s continue with the example of 10 monitor replacements. To determine which of the 10 used items should be exported, let’s consider the following environmental principles.

After reading this analysis, and the conclusions we are leaning toward, we would like you to participate in this discussion (prior to the final draft of this Export Policy document). Please send your questions, comments and observations to exports@retroworks.com.

³ <http://www.corpwatch.org/issues/PID.jsp?articleid=1608> February 2002 article on scrap exports to unknown uses.

⁴ Most large recyclers, such as Envirocycle, ElectroniCycle, and DMC, do not export leaded glass scrap overseas.

⁵ Unlike forestry in the US, forestry in developing nations has been blamed for many endangered species lists, particularly primates, and is not considered a sustainable practice. While not a focus here, waste paper is a major US export to Asia. http://www.janegoodall.org/chimp_central/conservation/issues/bushmeat_factsheet.html

⁶ As a percentage of repairable units, see Bureau of Labor statistics on decline in the repair market, compared with expansion in new product sales.

SHANGHAI (Dow Jones)--Following is a table of data for China's copper, nickel, aluminum, alumina, lead, zinc, tungsten, antimony, molybdenum imports and exports for Jan. 1 to Dec. 31, according to China's General Administration of Customs, via the State Materials Information Center.

Exports:

	Jan-Dec in tons	Change on year	Dec in tons	Change on month
Copper	177,908	-32%	12,644	-18%
Nickel	5,422	-41%	337	-18
Aluminum	408,829	+96%	35,529	-8%
Lead	472,071	+1%	51,585	+15%
Zinc	563,964	-5%	44,058	-25%
Tin	57,250	-26%	7,625	+212%
Tungsten	4,379	+60%	180	-36%
Antimony	22,097	-51%	1,620	-8%
Molybdenum	1,744	+6%	196	+109%
Scrap Copper	9,934	-2%	814	-8%
Scrap Aluminum	9,189	+22%	795	-3%
Alumina	25,339	+43%	1,362	+43%

Imports:

	Jan-Dec in tons	Change on year	Dec in tons	Change on month
Copper	1.7m	+9%	196,063	-7%
Nickel	37,407	+213%	3,935	+3%
Aluminum	529,637	-42%	42,649	-4%
Lead	28,788	+77%	3,385	-14%
Zinc	141,127	+9%	12,953	+12%
Tin	6,486	+31%	912	+25%
Tungsten	412	+2%	20	-25%
Antimony	189	-60%	11	-29%
Molybdenum	216	+22%	6	-53%
Scrap Copper	3.3m	+33%	304,906	-5%
Scrap Aluminum	367,802	-54%	30,976	-1%
Alumina	3.3m	+92%	317,400	+2%

China's largest import on this list is copper. Scrap copper imports have grown over 3 times faster than mined copper this year. The Chinese government does not ban imports of copper and gold plated items unless they can be reused (which they consider "dumping" in the "unfair trade practice" sense of the word)

2.0 Principles:

In order to build a consensus towards workable recycling business standards, we should begin with certain principles which most of us feel have been proven over time. The three principles presented below focus on (1) dumping, (2) mining v. recycling, and (3) recycling v. reuse/repair. These principles (aka "reduce, reuse, recycle") are based only on environmental effects, and we don't really touch on wages, social welfare, or whether a fixed TV is a good thing or a bad thing (some say they are more hazardous when they are working. These principles follow the life cycle of the product (e.g. monitors) from manufacture to maintained use to fate of the components, which has been done in a more thorough fashion for many products by scholars and consultants. The trick for this study is to apply these principles overseas.

1) Principle: Land disposal in developed countries is safer than land disposal in developing countries.

For the universal practice of dumping things which *aren't* recyclable by anyone, the worst lined landfills and monitored incinerators in the US are decades ahead of the best in India, China, Eastern Europe or most RICs. In some countries, they are centuries ahead. Where populations are burgeoning or in relocation, neighborhoods develop faster than a waste collection infrasture, and environmental chaos ensues. There may be no dump (or sewage⁷) at all except for a nearby river or field, much less an enforcement mechanism to ensure use. Whether something *is* recyclable or not is usually an economic question. In the West something may not be recyclable because of high labor/sorting costs; in the developing world, another material may not be recyclable because of transportation distances to factories which use it.

The most outrageous examples of foreign dumping, such as hazardous waste left on beaches in Nigeria prior to the initiation of the Basel Convention, are where countries with the means of safe disposal nevertheless send it to countries without those means simply to save a dollar. *As an environmental principle, it would be superior for poor countries to send their "disposables" back to the USA⁸.*

Today, in terms of tonnage of toxic material, the largest ongoing practice of toxic dumping on poorer nations beaches is from the western mining industry⁹, where mine owners are trying to avoid the expensive process of mine remediation.

Of course, the difficulty with this principle is that different countries have different definitions of "disposable", and some things disposed of in one country would never be disposed of in another. In the US, Singer Sewing is in liquidation, because very few Americans can afford the time to reattach a button or mend a tear. Salvation Army may refuse donations of even perfectly good sewing machines. The same dynamic makes America the largest exporter of used textiles, supplying 45% of the world market.¹⁰ Africa is the largest consumer of used clothing – which are re-sewn and reused, and still millions of people go barefoot. However, Africa has absolutely no use for items like winter boots, and no means to transport those items back north – sending winter clothes to Africa is therefore a form of dumping. Africa also has no discernable repair market for monitors (degaussing equipment, etc.); while there are dozens of sewing machine repair shops in Cameroun, it would be dumping to send "repairable monitors" to that country.

In other words, the principle which applies so simply to dumping does not apply to reuse and recycling.

⁷ "Do you have employee toilets? Can you send a photo?" is one test we have used to explore new markets. It is certainly not proof of ESM but the lack of a toilet correlates strongly with a lack of ESM.

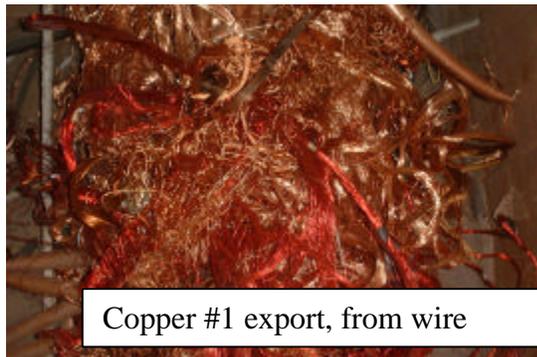
⁸ This is currently the law in the Maquila Law (maquiladora) zones of Mexico, established prior to NAFTA.

⁹ http://www.moles.org/ProjectUnderground/drillbits/6_03/hotspots.html Project Underground exists as a vehicle for the environmental, human rights and indigenous rights movements to carry out focused campaigns against abusive extractive resource activity.

¹⁰ <http://www.ciwmb.ca.gov/Markets/StatusRpts/exports.htm#Textiles> Calif. Integrated Waste Management Board

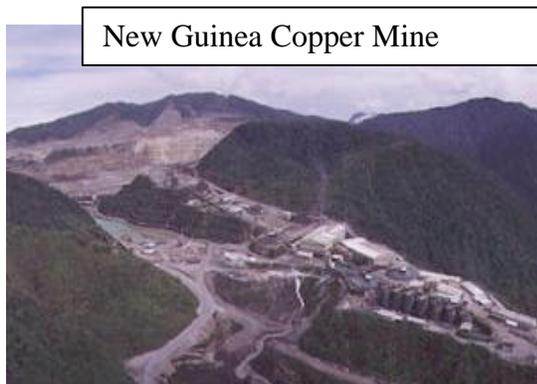
2) Principle: Recycling is almost always better than Mining / extraction.

Recycling is not practiced because it is clean. A toilet paper mill in Erving, Massachusetts makes 100% recycled material. The river it sits on is doubtlessly harmed by the heat and effluents from production. However, it is well established that the total amount of pollution and carbon use per ton of paper produced is far lower than production of toilet paper by cutting down trees and reducing them to bleached fiber.



Copper #1 export, from wire

While “saving trees” is still well ingrained among consumers and recyclers, mineral and metal mining is not as familiar. Yet “avoided extraction” is an even more compelling case for recycling. Recycling aluminum reduces energy use by 95% because mining aluminum bauxite from a mountainside and separating the ore is an extremely intensive procedure. When copper is mined, not only are the trees cut down, but the very earth for several hundred meters below those trees is scraped, bared, and exposed to chemical baths, and it may be centuries before a tree will grow on that land again. Lead mines kill rivers dead¹¹.



New Guinea Copper Mine

The harms from extraction are evident domestically¹² though the evidence shows that it is far worse overseas¹³. There is child labor, a high death rate, and atrocious environmental standards, and the industry itself is not even sustainable (jobs are lost when the mine is empty). Arguably, mining smelters in Eastern Europe have done more long-term harm to the environment than Chernobyl¹⁴. In 2000, the Swedish parliament gave Nobel consideration to Birsel Lemke of Turkey for his organization of

strikes against the Turkish gold mining industry.¹⁵ Closer to China, there are photos available of the mines which produce gold and copper for the electronics industry; the Marinduque Mining operation in the Philippines offers one atrocious example¹⁶.

Even the best mining is usually worse than the worst recycling. Like original sin... the worst environmental damage these monitors will ever cause, was already caused before the day they were sold. Clearly, if our business standards reduce or eliminate recycling, we need a better alternative than mining more ore.

¹¹ <http://ens.lycos.com/ens/aug99/1999L-08-11-01.html> photo, OK Tedi Copper Mine, New Guinea.

¹² www.mineralpolicy.org lists several US mining superfund sites.

¹³ http://news6.thdo.bbc.co.uk/hi/english/world/asia-pacific/newsid_32000/32669.stm Details of Chinese mining practices. For information on Chinese lead and zinc mines go to <http://www.mbandi.co.za/indy/indyming/ldzc/as/cj/p0005.htm>. For information on Phillipine and Turkish mining, visit www.mpi.org.au

¹⁴ <http://www.planetark.org/dailynewsstory.cfm/newsid/12951/story.htm> Planet Ark reprint of Reuters, detailing several eastern European metal refining disasters from copper and gold extraction.

¹⁵ <http://www.mineralpolicy.org/media/index.php3?nav=3&inc=release&release=79>

¹⁶ <http://ens.lycos.com/ens/may2001/2001L-05-02-03.html>. See also Mineral Policy Institute (Australia)

3) Repair and reuse is better than recycling.

Like the recycled tissue paper mill, secondary metal recycling is at best the lesser of two evils. While mining is an evil which will occur to fill whatever gap in demand recycling leaves, it does not make recycling pretty.

Shocking descriptions and photos of the recycling process have recently been posted at www.ban.org. It is difficult to discern how much Basel Action Network's photos of Guiyu, China¹⁷ recycling disturb us because of the low working standards and primitive metal extraction technology, and how much we are bothered by images of poverty in any practice, be it bakeries, hospitals, or schoolyards. But BAN is correct that recycling is dirty. Even in the West, the industry has a dark underbelly. One of the largest electronic copper smelters in the US was forcibly closed last year, and the principles sent to prison, following an FBI and EPA action near East St. Louis, Illinois.¹⁸

Unlike aluminum cans and office paper, however, durables like electronic appliances (and car parts, used shoes, and pots and pans) have a third alternative. If they are built with sufficient quality and foresight, and are supported by manufacturer product support, they can be reused. The used car economy in the US is seven times the size of the new car economy, and if teenagers had no used cars to learn on, we would have a "driving skills gap" as well as a "digital divide".¹⁹ Of course, average age of cars in poorer countries is even higher, and repair shops are even busier.

Assuming they are put to productive and good use, as an alternative to a newly



manufactured product, more environmental and economic benefits are gained from repair and reuse of the first 3 monitors in our example than from recycling the other 7 monitors²⁰. While recycling the 7 for individual materials saves mining, the recycling practice itself is nasty even in the US²¹.

Repair is an activity which requires active support through our proposed business standards.

¹⁷ <http://www.ban.org> *Exporting Harm: The High-Tech Trashing of Asia*

¹⁸ Chemetco smelter http://www.newstribune.com/stories/010900/sta_0109000099.asp.

¹⁹ Once again, we are not exploring the social costs and benefits of access.

²⁰ <http://www.epa.gov/region1/compliance/solid/jtrfinal00.pdf> a report on jobs created by electronics recycling infrastructure in Massachusetts

²¹ (see link on Chemetco's Illinois smelter -- the FBI and EPA shut down the company last year) http://www.newstribune.com/stories/010900/sta_0109000099.asp.

Traditionally, the biggest opponents of repair and reuse have been OEMs (which coined the term “planned obsolescence” in the 1960s, and which some allege impede repair as “market cannibalization”²²).

However, “repair” has also been used as an alibi by US recyclers who have no domestic processing. These exporters send containers overseas full of appliances “as is”. “As is” containers should have another name – “As if (!)”. True export-for-repair shops identify each monitor by make, model, year and serial code, and preferably the condition. The recyclers who perform this pre-technical inspection are rewarded by higher prices – which they will need in order to demanufacture the 70% of monitors refused by foreign repair shops.

The free market has largely kept winter boots sent to Africa – if a charity is unwilling to put the winter clothing aside, there are thousands of clothing collectors in the US, and an African importer can find another supplier who will. What makes electronics so special a problem is that recyclable and reusable components, such as copper coils (yokes) on TVs, are physically and securely attached to other components with screws, bolts and solder, and removing plastic housings from CRT screens is quite an effort. Electronics recycling is expensive in the West primarily because all of those parts must be separated by workers with power tools, by hand. Because electronics recycling is expensive, there is a poor collection infrastructure, which in turn makes foreigners desperate for the material willing to accept junk mixed into loads.

Africans will accept winter boots if there is a shortage of clothing. As supplies increase, buyers can raise their standards. Monitor repairers have lowered their prices in the past year, while “getting more picky”. Whereas “screen burn” was the only disqualifier for monitor shipments to Eastern Europe two years ago, today it is difficult to ship monitors with cosmetic flaws (yellowed plastic, low VGA resolution), and ElectroniCycle has begun demanufacturing monitors made before 1993 (unless they can be donated at cost to a non-profit setting up schools, such as World Computer Exchange²³).

The repair market is legitimate, but frequently abused, and often a certified technician must speak with the export market to clarify standards. And while durables are repaired and maintained longer in poorer countries, they need to be certifiably repairable in the first place.

4) Principle: Source reduction has the greatest promise

Reuse and repair of appliances can fill a social need like sewing machines, or computers to close the “digital divide”, can provide very high employment, and prolong our finite natural resources. But it is not perfect. Prolonging the use of old kitchen appliances, for example, can increase carbon use because older appliances are less

²² More recently in China, repair shops have been closed based on “unfair trading competition” or “dumping below market”, as if the monitors were new. Nigeria’s new clothing manufacturing industry has blocked shipments of used clothing in Lagos.

²³ www.worldcomputerexchange.org

energy efficient. And reuse machines tend to fill the needs of poorer people without reducing the consumption by the rich.

Long term, to reduce the dumping, mining and recycling will require new technologies. Lead-free solder is a major source of discussion among engineers (www.lead-free.org), and its primary benefit will be reduced mining, without the sacrifices which come from reuse and repair. According to Electronic Engineering Times²⁴ European ban on lead solder is expected to take effect in 2006. If it succeeds (and replacement technology survives the test of retrospect, unlike brominated flame retardants and other past “advances”), it will solve the debate of recycling v. mining of lead (CRT monitors are already expected to be phased out by flat panels in the next 10 years).

Unfortunately, the source reduction principle has little apparent application to the export debate of appliances we’ll be collecting for the next decade (except that it may reduce the demand for recovered scrap if that scrap is left in attics and basements until the last minute). We just hope the energy of the export debate reflects its light upon it, and that *whatever* standards or legislation we propose *does source reduction no harm*.

Summary of Environmental Principles:

A quick summary of the Environmental Principles we will use to improve recycling’s standard business practices: Don’t dump on the poor. Don’t mine. And reduce, reuse, recycle. Admittedly, those are purely environmental standards – there is considerable world debate about social standards, and wage and worker protection standards differ around the world²⁵. For best business practices, we are left with 3 questions:

To prevent dumping: Should US electronics companies be allowed to send unprocessed, mixed loads of electronics overseas for reuse, recycling or disposal as those countries see fit? Or should those loads be demanufactured or certified repairable by a technician?

To avoid mining: If the US buys monitors made overseas, should we send the semi-precious metals needed to make those monitors? If so, how can those sales be used as incentives toward Environmentally Safe Management [ESM]? Can OEMs reduce the use of elements like lead solder, making neither mining nor recycling a necessity?

To promote reducing and reusing: Given the decline of repair in the US²⁶, should we be willing to export repairable items to technicians in Eastern Europe, Latin America, etc. where repair and reuse is a way of life? Are there activities OEMs can undertake to promote repair and reuse?

²⁴ <http://www.electronicstimes.com/story/OEG20020224S0003> “Uphill battle to end the use of lead”.

²⁵ Free trade is an issue we have an opinion on, but social arguments are beyond the scope of this paper.

²⁶ Bureau of Labor Statistics – consumer product repair is the only technical job projected to decline steeply

3.0 Standards, or Best Business Practices:

Until the West stops purchasing electronics made with copper, lead, gold and other metals, it is unlikely we will reduce environmental and human harm by restricting the flow of metals at the end of the pipe. Restrict recycling and mining will increase. Still, electronics scrap recycling is a new practice, open to misunderstanding and abuse. What this field calls for is some "BEST BUSINESS PRACTICES".

As an approach to Best Business Practices, we have researched the markets and practices of several different recyclers. The draft policy which ElectroniCycle Inc. is working from was formed through the following steps:

- a. Identify and group the "business practices" of the recycling community
- b. Analyze each practice according to accepted Environmental Principles
- c. Propose concrete, employable standards which move us towards those principles, while still coping with the volume of material coming through the door every day
- d. Measure and revisit our performance in meeting those standards, and revisit those standards as necessary.

First, we have identified three basic categories of electronics which are currently being exported by various recycling companies, through design or ignorance, for better or worse:

- 1) materials the RIC's do not need and do not want
- 2) materials the RIC's manufacturers want for raw material / scrap value
- 3) materials which the RIC's entrepreneur/repair sector wants for repair and resale

Second, we have already begun analyzing these practices above. According to the environmental principles above, the worst offense is **(1)** to send either sorted residue known to be worthless to the buyer. More commonly, the dumping occurs through neglect -- leaving unrepairable and unrecyclable components attached ("toxics along for the ride"). The worst and most readily altered practice is leaving the leaded glass CRT attached to a \$0.75 scrap copper yoke, which the "recyclers" in Guiyu simply break off and discard in a canal. In other words, US recyclers should not send things to other countries which they don't need and don't want, even if that means demanufacturing, separating and processing the items in the US.

Analyzing the second category, **(2)** scrap recycling, is more complex. This is a question of whether to send the copper yoke, which the industries in Asia demand in order to meet our own appetite for new products. Should we be more motivated by the photos of scrap recycling, or photos of mining in the Phillipines?²⁷

One preference is stated by UNCTAD, which is to allow Rapidly Industrializing Countries (RICs) to recycle as an alternative to exploitive and unsustainable mining, but to work towards an international ESM (Environmentally Safe Management) standard. Given the harsh human conditions of many scrap recycling outfits in RICs, and the UN's

²⁷ <http://ens.lycos.com/ens/may2001/2001L-05-02-03.html>

penchant for speed, this may take a long time. In the end, this is a very traditional question: do you effect more change by doing commerce with foreign recycling companies (or communists, or apartheidists) or by refusing to interact with them?

Analyzing the third export practice, **(3)** export for reuse or repair, seems easy to do conceptually, more difficult to monitor in practice. If a repair shop cannot take Apple monitors, ElectroniCycle removes them and demanufactures them, rather than insisting "they are part of the deal". In general, repair markets offer dollars on the unit rather than pennies on the pound, and specifications are supposed to be high. The more picky the buyer, the less likely they are just after the copper coils attached to the CRT. The Shipping Inventory below shows categories of repaired and repairable monitors; each pallet also has its own manifest, showing the individual make, model, serial number and repairs necessary for each unit on the pallet.

Sample Shipping Inventory		Monday 8/27/2001	
40: Category - Monitors and peripherals			
Individual pallet manifests (each monitor brand, date, condition) available			
Description	Per	Cost/unit	No. Units
Item 41 Monitor - not tested 14/15" (S)VGA 1990,91,92	unit	\$7.00	180
Item 42 Monitor - not tested 14" (S)VGA 93 to present	unit	\$9.00	288
Item 43 Monitor - not tested 15" (S)VGA 93 to present	unit	\$13.00	288
Item 44 Monitor - not tested 17" (S)VGA	unit	\$19.00	0
Item 45 Monitor - not tested 19/20/21" (S)VGA	unit	\$35.00	0
Item 46 Monitor - tested not working 14" (S)VGA	unit	\$7.00	0
Item 47 Monitor - tested not working 15" (S)VGA	unit	\$11.00	0
Item 48 Monitor - tested not working 17" (S)VGA	unit	\$18.00	72
Item 49 Monitor - tested not working 19/20/21" (S)VGA	unit	\$19.00	24
Item 50 Monitor - working 14" (S)VGA 1993 to present	unit	\$20.00	0
Item 51 Monitor - working 15" (S)VGA 1993 to present	unit	\$29.00	32
Item 52 Monitor - working 17" (S)VGA 1993 to present	unit	\$57.00	91
53 Sun Monitors, pristine condition	\$ 40		24
54 Wyse monochrome terminal monitors Untested	\$ 10		120
91 Cabletron Smartswitch new, unopened boxes ATM	\$ 29		45
91 Cabletron Smartswitch new, unopened boxes Ethernet	\$ 33		70
91 Cabletron Smartswitch new, unopened boxes Fiber	\$ 29		33
Call for inventory lists of the following items:			
CC CPUs, pentium, 486 currently consigned to purchase order.			
XX Intact laser, matrix, jet printers available, will sort to your specifications			
XX Tested working TVs available, all years			
XX VCRs, stereo equipment			
XX Sewing machines			
XX Copy machines			
XX Shoes, clothing			
All used items unless indicated			
<input type="checkbox"/> Guaranteed no screen burn			
<input type="checkbox"/> No irreparable defects			
<input type="checkbox"/> Plastic housings intact but not scrubbed unless indicated. Some bases (see pallet manifest).			
<input type="checkbox"/> Inspection or digital photos available			
<input type="checkbox"/> Escrow services accepted for orders over \$20,000			

²⁸ US Commerce Department <http://web.ita.doc.gov/ticwebsite/FAQs.nsf/6683DCE2E5871DF9852565BC00785DDF/79A1A2610E110BBE85256A37004F9FCA?>

²⁹ ElectroniCycle has the advantage of 27 year history as a factory-authorized repair facility for consumer electronics from over 30 OEMs.

³⁰ This is a long established practice (when Nigeria and Mexico opened clothing manufacturing, they both banned shipments of clothing from the Salvation Army and Goodwill Industries).

Suggested Best Business Practices

As far as Recycling Standards go, we offer the following “best business practices” for adaptation by all electronics recycling companies. (ElectroniCycle Inc. and Envirocycle Inc. have already adapted these).

1. RECYCLERS: BEST BUSINESS PRACTICES FOR EXPORTING SCRAP AND REPAIRABLE ELECTRONICS

Capacity to handle the “other stuff”: If a US company calls itself a recycler rather than an exporter, it should demonstrate the capacity to take apart the 7 of 10 monitors and reduce them to a form (copper scrap, gold scrap, etc.), which is needed overseas. If the monitors are sent overseas for repair, the US company should manifest each individual monitor by make/model, brand and year, and if possible what the technical repair is needed. Anything else in the container is “toxics along for the ride”.

Demanufacturers spend about \$2.25 in labor to demanufacture and recycle each non-qualified monitor. The temptation is strong to throw those in with the good, and ask for less money for the good ones. We suspect this is the practice with a number of "recyclers" who have no domestic recycling plant or capacity. “Toxics along for the ride” is a term EPA uses when this practice is used to dilute other hazardous wastes.

There are several indicators which show that a recycler is able to follow this practice, (assuming they even claim to). First, detailed manifests on the products that are sold are to be expected. The material has to be kept inside and dry, and some plant space is needed for sorting of products by type and brand for different markets (for example, by 120 or 220 current, PAL or NST television signal, etc.). Some level of technical expertise is needed on the staff to identify non-repairable problems. And unless the company is an asset recovery company which only purchases what it needs, some capacity should be in place to recycle the items which aren't repairable. The repair and asset recovery companies overseas should be very picky, ask for manifests and digital photos, and pay in dollars per unit rather than pennies per pound.

Recyclers need the tools to practice of sending processed, separated electronics scrap to the most conscientious available vendors – those who do not pay the highest rates but who most openly demonstrate their willingness and intention to follow ESM guidelines, while recovering the maximum amount of material. We hope that trading with “clean” companies at a monetary compromise will show other foreign recyclers that ESM standards can help them win material more cheaply, and be profitable. The problem with this approach is a lack of actual contact; ElectroniCycle has often had only personal references to go by in the scrap trade (repair is more transparent, as the technical skill of the importer can be evidenced by the pickiness they demonstrate in approving individual units on a manifest). And when the apparent best buyer suddenly cuts off purchases, the recycler needs to have an immediate back-up available.

The US Department of Commerce makes several foreign trade visits each year; that agency should take these recommendations and test them overseas.

2. MANUFACTURERS SHOULD SUPPORT THESE PRACTICES THROUGH THEIR OWN PRACTICES.

The ideal practice is DFE – Design for the Environment. While bans on exports have not gained broad acceptance, Europe is planning to ban lead solder in electronics by 2006. This is not a recycling practice, per se, and is not included as a “recycling standard” below. But the Lead Free Soldering Technology Centre (www.lead-free.org) is an excellent source of information for engineers and scientist trying to build circuitry without rare metals and hazardous chemicals.

Manufacturers dictate reduction in the use of lead, dictate the support offered to repair and reuse, and have the power to purchase copper, gold, and other metals through recyclers who meet the best business practices above. “Post consumer recycled content” should become as important to CRT manufacture as it is to copy paper. Once manufacturers are buying scrap consciously, they will also be in the position to reward ESM practices.

Hitachi is currently the only manufacturer to provide downloadable repair manuals³¹. Some other manufacturers charge up to \$40 to the repair facility per manual (remember that when you get your next TV repair quote). While no one is protesting about “planned obsolescence” these days, there is certainly not much “good Samaritan activity” by manufacturers to make repair easier. The US is giving up on repair, and consumer repair technician is one of the only skilled technical professions projected to make double-digit declines in employment³².

Industry should meet with US repair technicians and come to terms to make products more repairable, and technicians should recognize higher quality products, just as we would recognize recycled content or recyclability. Recyclers should employ at least one certified repair technician to examine reuse and repair exports, to certify that anything not working really is repairable somewhere else.

Conclusion

Personally, I believe it is easier to leverage business practices when there is business going on. This paper would lean towards a standard of sending processed scrap (demanufactured, separated from unwanted components) for metal recovery to any country which mines, refines or uses metals, and using that economic leverage to demand ESM in the countries using the metal.

However, I don’t think we have proven that case positively. Our hope is that UNCTAD will succeed – and quickly – in defining an actual test of Environmentally Safe Management practices for recyclers overseas. Perhaps foreign recyclers will adapt ESM more quickly if they see that it leads to more business and competitive advantage. In practice, however, US recyclers are rarely able to inspect a foreign buyer, and even

³¹ <http://www.hitachi.com/tv/resource/prodsupport/ownmanuals.shtml>

³² repair (see Bureau of Labor Statistics <http://www.bls.gov/oco/ocos187.htm>)

after inspection cannot be sure that material will not be re-brokered by that buyer to less savory operators.

If you are unsure about the recycling company you are working with, here are a few simple questions that may indicate what is going on.

- Does the company really have the capacity to demanufacture 7 out of 10 of the leaded CRT monitors it receives?³³ (If the company ONLY exports, then they export EVERYTHING.) If not, is it paying for specific, tested materials and rejecting those that aren't reusable?
- What do they do with monitors that can't be repaired?
- What technical staff do they have to examine whether monitors are repairable?
- If they export scrap, what are the chemical weights (gram per Kg) of the copper, gold, or other metals the scrap contains? (if it's a jumble of ungraded old appliances, they don't know, and the buyer doesn't either)
- Who pays for transportation? Is the material worth the transport, or is the transport cost an alternative to dumping? Charging a fee to export material is a bad omen.

We hope that all recyclers will take the time to answer these questions, and to help the industry form a set of best business practices which have consensus, agreement, and are free for use by any business willing to follow them.

www.retroworks.com
www.electroniccycle.com

The author of this report, Robin Ingenthron, has been active in the recycling field since the 1970s. He has a BA degree in International Relations from Carelton College, and an MBA from Boston University with a concentration in Public Management. He was an Executive Director for the non-profit recycling organization from 1987-1992, where he consulted on recycling markets and infrastructure development for several state, federal and private organizations. In 1992 he was appointed Recycling Director for the Massachusetts DEP, where he was eventually promoted to Deputy Director of DEP's Consumer Programs Division.

At Massachusetts DEP, Robin administered a staff of 20, as well as policy and regulations (container deposit laws, waste bans, solid waste facility rules, municipal recycling standards, etc.) and a \$5-10M per year in grants to build recycling infrastructure. In 1999 (before implementation of DEP's waste ban on CRTs), Robin left DEP and established a self-sustaining reuse, export, trade and recycling plant in Vermont. In 2001 he merged his consulting and recycling business with ElectroniCycle Inc., the fastest-growing TV and electronics recycler in the Northeast.

As President of American Retroworks Inc., Robin continues to offer consulting and research in the areas of recycling program design and policy. American Retroworks also collects sewing machines, typewriters, clothing, shoes and other donations for shipment to Africa, Asia and South America. Robin served in the US Peace Corps from 1984-1986, and was afterwards hired by Peace Corps as a cross-cultural trainer for new volunteers.

³³ Some "asset recovery" companies legitimately build better loads by purchasing the monitors from recyclers, or by bidding on company take-outs. But those are not RECYCLING companies and should not say that they can recycle anything given to them.

LINKS: The price of recycling or not recycling used electronics:

We urge readers to consult with the following organizations websites:

Mineral Policy Center (US) (www.mineralpolicy.org)
Mineral Policy Institute (Australia) (www.mpi.org.au)
Project Underground (US) (www.moles.org)

Those sites have some very dramatic photos and links to mining and strip-mining operations. Readers should balance that information by consulting the following two sites critical of all exports of recyclable scrap:

Silicon Valley Toxics Coalition (www.svtc.org)
Basel Action Network (www.ban.org)

The BAN site has a recent policy paper which shows conditions at some of the worst reclamation sites in China.

Some other non-profit sites with general links to electronics recycling issues:

EIA Electronics Industry Assoc. (www.eia.org)
EPA Environmental Protection Agency (www.epa.gov)
IAER International Association of Electronics Recyclers (www.iaer.org)
IPC (www.lead-free.org)
ISRI Institute of Scrap Recycling Industries (www.isri.org)
NRC National Recycling Coalition (www.nrc-recycle.org)
NSC National Safety Council (www.nsc.org/ehc/epr2.htm)