



Backgrounder

Electronics Waste

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Why is electronics waste an issue today?

As activists point out, there are an estimated 62 million computers that were expected to be junked in 2003 -- three times the number that were obsolete in 1999. The E-waste issue has moved into prominence in the last few years, in part because the environmentalists have been able to gain major media attention to the issue. In California and Massachusetts, cathode ray tubes are banned from landfills. Maine and Minnesota recently banned CRTs from landfills as well. (In fact, they had always been restricted from California's landfills as is ALL Household haz waste (not enforced) -- but the activists discovered this three years ago, and this forced the state agencies to deal with it.) Local governments then put pressure on the state to pass new legislation because they did not want to be burdened with the new costs. About 300 local governments mostly in MA and CA have passed resolutions pushing their states to adopt takeback laws for electronics or at least CRTs.

- ❑ While all appliances and electronics comprised no more than 4% of MSW in 2000, (by weight) the volume is growing with technology moving so fast. Today it is frequently more cost-effective to replace a computer or TV than upgrade it.
- ❑ **What's more, the bulk of old electronics -- perhaps 75% -- are sitting in garages and warehouses. NO one knows the exact figures on these.**
- ❑ Electronics are costly for local governments to deal with -- it costs between 5-25 cents/ pound to recycle, after transportation.

Don't electronics have toxics in them?

Yes, there is a lot of lead used in the glass of cathode ray tubes for monitors and TVs, and there is lead, mercury, cadmium, and chromium used in many electronics items. However, there is much less of these materials found in today's circuit board than has been widely reported in the media.

The real question is: *Are these metals leaching into the environment in manufacturing or upon disposal, and what is their relative contribution to the overall toxicity of the waste stream?*

The problems of mercury in the environment are well-established, and there are many bills and laws now addressing the mercury issue. Congress has not acted on mercury, however, except for thermometers. This leaves it to a patchwork of state laws.

As for lead: there is no alternative to using lead in CRTs. Even if everyone were to go out and buy backlit displays which use small amounts of mercury for the light, the huge issue of what to do with old CRTs will loom. While there is evidence that keeping CRTs out of incinerators

reduced toxics, we have not seen evidence that they are leaching lead in landfills. No one in industry is advocating that CRTs should be landfilled, however.

The European Union directive (RoHS) restricts lead, cadmium, mercury, chromium VI, and three brominated flame retardants by 2006. There are certain exemptions. Now this requirement has already lead to major -re-designs. Once a major manufacturer is forced to design out these metals in non-critical applications, it becomes a de facto standard.

The problem is that even after companies go to the expense of phasing out say lead solder, there is no guarantee the replacements will be any better for the environment, and they may not be recyclable. In this case, manufacturers will probably continue to use the less expensive lead solder in countries where it is not restricted. Bear in mind, the big brand owners must compete with less expensive "no-names" in the U.S.

Again, it should be emphasized, from an environmental standpoint, the big issue is leaded glass, not lead solder. These regulations will increase the cost of electronics to consumers, with very limited environmental benefit.

A recent study from the High Density Packaging User Group concluded that "for beryllium, cadmium and mercury . . .the HPUG study did not detect these chemicals in any of the boards, add-in cards or cables used in PC assemblies." They compared their findings with those of a six-year old Microelectronics and Computer Technology Corp. (MCC, a Texas consortium) study, which is widely quoted by environmental groups and the media, and found that in some cases, the actual content today is an order of magnitude lower.

The concern over toxicity in current products has, in some cases, been overstated.

To be fair, however, we *don't know the toxicity levels* in the really old TVs and electronics that are currently in storage!

What are electronics makers currently doing to address the issue?

First of all, about 12 countries currently have takeback laws on the books for electronics; more than 15 have rechargeable battery laws (including the US). With the new WEEE directive, we predict about 28 countries worldwide will have takeback laws within five years.

In more than seven European countries, manufacturers are paying fees into privately run collection organizations. In many cases, there is a visible "fee" that consumers see at retail. However, all money is collected from manufacturers -- there is little government handling of money. The exception is Norway, where fees on electronics for imports are collected at import (avoiding free riders) and distributed to appropriate collection groups. Norway is one leader in electronics recycling today.

In the U.S., the large companies all have various takeback programs or are contributing to consumer collection programs in the U.S. These are all well- publicized.

It is important to note that most major computer makers have had commercial takeback of old units for many years. In fact, there are hundreds of recyclers in the U.S., but most of them want to handle the high-volume corporate electronics. For this they charge a sliding fee, depending on if they can re-furbish the units or re-sell parts.

Most are not interested in handling post-consumer units, as these tend to be very old and have no value. Local governments do not have the budget -- without charging fees or raising taxes -- to pay the recyclers.

Japanese companies are making major investments in green electronics, in part because they hope to use these attributes as a marketing point, and because the new technology can in some cases be commercialized. Getting recycled material in Japan is not much problem for obvious reasons: smaller country, no landfill space, and importantly, a culture of cooperation between industry sectors. However, to their credit, many Japanese firms have managed to push "zero waste" at their US plants as well.

Many U.S. companies have the same goals, but do not publish their environmental activities very well. IBM is the only US company we found that publishes what it spends on environmental activities. Moreover, all companies vary as to how they account for "environment."

We will have an updated overview of 29 companies in the new edition of our report, "Electronics Recycling: What to Expect from Global Mandates" due in August.

Why is there no agreement yet on a national plan?

From what we can determine, a big sticking point is who should pay for the historic waste. It has been difficult for manufacturers to agree on who should pay for what, and if there should be a visible fee or not.

What are states doing?

The pressure is highest in the two states with existing CRT landfill bans – California and Massachusetts. California. Local governments – about 300 of them – have passed ordinances urging the state to require electronics makers to pay for electronics recycling.

There are numerous programs now being funded by electronics makers, with the Japanese TV manufacturers making major contributions.

Many states collect E-waste on certain days, but *most cannot afford to collect on an ongoing basis.*

As a result, 26 states have introduced 52 electronics waste bills this year. They range from studies to landfill bans to complete takeback mandates.

- Eight bills include some sort of fee assessed to help pay for ewaste recycling
- 11 bills would require some sort of takeback or producer responsibility
- 10 would ban electronics or at least CRTs from landfills
- Five bills would restrict heavy metals in certain electronics

Why are "advance recovery fees" problematic?

The problem with charging a fee on sales in just one state – or different fees in different states – is that they open the issue of taxation for Internet sales. This is not technically a problem for really large companies such as Dell. However, if it is legal to "tax" internet sales the nation's small niche businesses will suffer a severe setback in trying to cope with such a patchwork.

If a state tries to do an advance recovery fee that affects Internet sales, there could be litigation.

What's the difference between the WEEE directive and what is being proposed in the U.S.?

There are two directives:

WEEE – requires takeback by manufacturers. They must finance current and all historic waste. Each member state will implement as they see fit, and they can be more stringent. The directive covers everything with a battery or a cord!!

In the US only computers, peripherals, and TVs are on the table. (There is a fairly well-developed system for recycling of large appliances already in the US.)

RoHS – phases out heavy metals and just three brominated flame retardants from electronics, but allows certain exemptions. Committees will have to hammer out better definitions. For example, “servers” are exempt, but no one knows what a “server” will be –it can be a personal computer! Member states cannot be more stringent than the directive on this issue.

State bills that include heavy metals tend to just mention a blanket ban on all of them, with no exemptions, and the ban includes PVC.

Please note, that with the exception of Ontario Canada, and perhaps Australia, no country is implementing “EPR” on a state basis – *all systems are national*. Ontario and Quebec are running into serious problems in current attempts to implement EPR bills.

Won't takeback laws serve to improve electronics designs?

Not specifically. As with packaging, companies tend to see fees as a bit of a tax, and just pay it and move on. Recent surveys indicated that unless industry is able to standardize certain design aspects, such as snap-apart frames and use certain plastic resins across the board, the “design for disassembly” ideas we thought would help probably won't for many years.

Computers probably could be designed for longer life, however.

EPA is working on some positive incentives for better designs, and this may be a better way to go than mandates.

What about E-Waste Exports? Doesn't it all go to illegal operations in Asia?

A number of the state bills would ban exports of used electronics unless the receiving country has comparable working conditions to the U.S. There will have to be some exports of electronics or components to Asia, because that is where electronics are now made.

It is not fair to assume that 100% of exports are going to illegal operations, though perhaps a good portion of them are.

China's recent ban on imports of scrap electronics has not stopped the flow of old electronics to illegal operations, because they seem to get in "underground," However, the **policy has stopped the critical feedstock for legitimate Chinese recyclers**, and there are no opportunities for low income Chinese people to obtain refurbished computers.

There are many efforts afoot to certify recyclers, and given the *negative publicity*, it is doubtful any large or national recycling scheme run by industry would try to do illegal exports.

What about using prison labor?

Environmentalists have been critical of a federal prison program that trains inmates on how to repair electronics. The system is expanding, and this is one low-cost alternative for disassembly of computers in the U.S. The programs have a waiting list of inmates trying to get in.

Activists don't want prison labor to be used, as they think it unfairly competes with regular recyclers.

From what we can tell, these programs comply with worker safety laws. Taxpayers must pay for inmates anyway. It is a judgment call.

Does the U.S. have enough infrastructure to handle electronics waste, if there were a national program?

For general disassembly and getting the metals to markets, there are hundreds of electronics recyclers out there. The key issue has been money.

There needs to be more infrastructure and market development for plastics, and even CRT glass, however. Recyclers say that within a few years, there may not be any U.S. markets for recycled CRT glass. Since Dow Corning is closing its Pennsylvania leaded glass plant, there are only four U.S. manufacturers are left, and they are having a difficult time competing with cheap Chinese imports.

There are potential alternative markets for the CRT glass and plastic housings in the construction sector. However, U.S. industry does not have good record of exploiting all of these markets. You only have to look at the state of plastics recycling in general.

Which policy options make the most sense?

There seem to be two issues here:

1. historic waste – getting the stuff out of garages and warehouses
2. Recent and future E-Waste

It appears that to really address the mountain of old waste, a collective solution will be needed, with the cooperation of government and industry. Surveys vary on whether consumers will pay to get their stuff recycled or not. My instinct is that overall, the only way to address all E-waste is to enable free take-back in some way. Government should bear a part of the burden, but today, in the current economy, local governments are strapped for cash. Consumers will ultimately pay for recycling in the cost of new equipment. Its just matter of

- A. how efficient can you make the system
- B. do you want consumers to see the cost?

For current and future waste, it appears the retailer takeback can be efficient, and it is doable even for very small retailers and consultants – if we have a good national collection system in place. (Large retailers would backhaul to warehouses – small retailers would use waste haulers.)

Bear in mind that right now, companies cannot even accumulate too many CRT's under the Resource Conservation and Recovery Act – they become hazardous waste, and no one wants to be a generator. This is a legal barrier to E-waste recycling that must be addressed. EPA was about to clarify this, but the regulation got held up amidst activist screams that the regulation would lead to rampant exports. Is this productive?

What does Raymond Communications do?

We have been publishing State Recycling Laws Update for 11 years. We also track recycling policy in 39 countries with Recycling Laws International, and we have special reports on electronics and battery recycling laws worldwide. (See web site at <http://www.raymond.com>)

We also do some corporate research and referral to consultants that deal with compliance, packaging design, marketing, government relations in Europe, and software. We also organize the **Take it Back!** Conference. The next conference will be March 2003 in San Francisco.