

Strategy Report for Electronics Waste Management in Iowa



**Prepared by:
Iowa Department of Natural Resources,
Environmental Services Division,
Energy & Waste Management Bureau**

November 26, 2003

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Introduction

In 2002, the Iowa Legislature passed Iowa Code Section 455D.6(7) which charged the Iowa Department of Natural Resources (IDNR) to develop a strategy and recommend to the Environmental Protection Commission (EPC), administrative rules to implement by January 1, 2004 a strategy for the recycling of electronic goods and the disassembly and removal of toxic parts from electronic goods. Completion of 455D.6(7) by IDNR has taken place in a two-fold process: the development of administrative rules for electronics recyclers and the development of a strategy report to guide state policy and procedure related to Iowa's electronic waste. This document is the strategy report.

Background

Electronics is one of the fastest growing waste streams. According to a study completed for the Department of Natural Resources in 2002 (see Appendix C for the executive summary), Iowans generated 274,000 obsolete personal computers in 2001. By 2005 that number is expected to double, meaning one computer will become obsolete for every new computer put on the market¹.

Electronics waste is of particular concern due to the potential hazards they possess through their composition, which may include hazardous or toxic components and materials. For example, several states, including Minnesota, have implemented landfill bans for cathode ray tubes (CRT) due to their high lead content. Emerging studies have shown that some other electronic devices may also have levels of lead and other hazardous materials (e.g. cadmium, mercury) that cause them to fail Toxicity Characteristic Leaching Procedure (TCLP) tests, and thus require specific waste handling.

To date, fifty-two electronics waste management bills have been introduced in 26 states and the federal government (see Appendix D for more information). International requirements through the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive as well as the Restrictions on Hazardous Substances (RoHS) Directive have also been introduced and passed into law in other countries, and are currently emerging in proposed U.S. legislation. The IDNR has been actively following these national and regional initiatives.

The IDNR is also providing assistance and resources to build upon current state infrastructure (see Appendix B). For example electronics are a priority area for the Solid Waste Alternatives Program and IDNR has provided grants to five communities to start sustainable electronics collection programs. Over 100 tons of electronics have been collected from various state-sponsored collection events over the past year. IDNR's education and outreach initiatives have included site visits to recyclers, an electronics management web site, and development of informational resources.

¹ Wuf Technologies, LLC, "Iowa Electronics Waste Characterization Study", Iowa DNR contracted study, 2002.

Methodology:

A multi-stakeholder advisory committee (see Appendix A), consisting of electronics recyclers, landfill operators, the Iowa Society of Solid Waste Operations (ISOSWO), the Iowa Recycling Association (IRA), and federal, state, and local government officials, was convened. The advisory committee met five times on March 10, July 28, August 6, September 19, and November 3, 2003, to complete this report.

Committee members were asked for their perspective and expertise on what issues were of highest priority in regard to state policy and initiatives for electronics waste management. To ensure the advisory committee was aware of national and international initiatives, the IDNR hosted Brian Mitchell from the Environmental Protection Agency and Scott Cassel from the Product Stewardship Institute (of which the Department is a member) as expert witnesses at our July and August meetings.

In subsequent meetings, committee members deliberated and prioritized topics they felt should be given priority or further consideration. Those priority areas identified were:

1. Evaluation of a Landfill Ban
2. Funding and Monetary Incentives
3. Market Development
4. Regulatory Scope
5. Education

Further discussion then took place to establish specific recommendations to best address these priority areas. Those specific recommendations are as follows. It should be noted that these recommendations were supported by a majority of the committee and some recommendations were not unanimous.

Recommendations:

1. Evaluation of a Landfill Ban:

The IDNR has developed a procedure for evaluating the necessity and feasibility of implementing a landfill ban. This procedure utilizes an advisory committee and systematically looks at the feasibility and impacts of a landfill ban and alternative methods of diverting the material from disposal.

- The legislature should consider directing IDNR to undertake the Determination Procedure for Solid Waste Disposal Bans, and issue a report on the feasibility and appropriateness of a ban of select electronics from Iowa landfills for the 2005 session.

2. Funding and Monetary Incentives:

Financial resources and incentives are needed to foster new and existing businesses undertaking electronics recycling. Furthermore, we must create greater value in the proper management of electronics waste. Specific action steps included the following.

- The DNR should maintain electronics waste management as a priority waste stream within their Solid Waste Alternatives Program (SWAP).

- Alternative funding sources such as product fees, and retailers license fee to support the proper management of electronics as have been proposed in other states should be explored and considered.
- Continue support and increase emphasis on programs that assist the recycling industry within IDNR and the Iowa Department of Economic Development (IDED).
- Support the development of a marketing program through Recycle Iowa (IDED) that will focus on the promotion of the electronics recycling industry, as well as industries utilizing raw materials derived from recycling electronics.
- Develop an awards program to recognize outstanding businesses and programs that are aiding the growth of the electronics recycling industry.

3. Market Development:

In order to develop and maintain a strong electronics recycling infrastructure, the business of recycling electronics must be profitable or sustainable. Recommended action steps included the following.

- Offer tax incentives for recycling properties and equipment that are utilized within the electronics recycling industry by expanding current legislation to include electronics waste.
- Increase funding for research projects and initiatives to develop infrastructure and markets for electronics recycling programs and derived materials.
- Develop and implement state government procurement and end-of-life management program for electronics that incorporates sustainability and best management practices, and encourage county, city, and other units of government to do the same.

4. Regulatory:

Businesses wishing to dispose of their end-of-life electronics and electronics recyclers need a better understanding of applicable regulations and assurance that the regulations are implemented in a consistent manner.

- Consider state re-adoption of Resource Conservation and Recovery Act (RCRA) Subtitle C, thus allowing Iowa hazardous waste regulations (some of which would apply to electronics waste) to be implemented, clarified, and enforced by state government regulatory agencies and officials. Currently, these responsibilities are solely that of federal government agencies and officials.

5. Education:

Educational programs to aid in understanding and awareness of electronics waste management issues, and to encourage the recycling of electronics should be maintained and expanded. The following specific action steps were recommended.

- Maintain and consider expanding current educational efforts such as developing and distributing point-of-sale educational materials to retailers and consumers about electronics recycling.
- Disseminate information regarding the applicability of federal regulations to electronic waste management. IDNR should partner with the Environmental Protection Agency as needed to achieve this objective.

Appendix A: Advisory Committee Members

Joe Aho	Recycle America Alliance - eCycling Services
Bill Bingaman	Computer Renaissance
Dave Cretors	Iowa Department of Economic Development
Dave Elias	Eastern Central Iowa Council of Governments
Rodger Kaster	Rathbun Solid Waste Commission
Barb Klawiter	REACT Center
Dave Long	Midwest Electronic Recovery
Judi Mendenhall	Metro Waste Authority, Regional Collection Center
Dan Mickelsen	Iowa Society of Solid Waste Operations
Brian Mitchell	EPA Region 7, Office of External Programs
Jeff Myrom	DNR, Energy and Waste Management Bureau
Kevin Officer	Iowa Recycling Association Iowa Environmental Council
Merry Rankin	DNR, Energy and Waste Management Bureau
Amber Sauser	DNR, Field Office 1
Theresa Stiner	DNR, Energy and Waste Management Bureau
Larry Young	A-TEC Recycling, Inc.

Appendix B: Summary of FY 2003 Department Sponsored Electronics Collection Events and Initiatives

Introduction

The Department has been involved in several activities addressing the growing electronic waste (e-waste) stream and the infrastructure needed to support its appropriate management. These include the following:

- County-wide computer collection events.
- Entity-targeted electronics collection events.
- Financial assistance opportunities to local governments to initiate sustainable electronics reuse / recycling programs.
- Participation in the national dialogue on electronics product stewardship with other states, federal government representatives, and electronics manufacturing representatives.
- The completion of rules addressing electronic waste processing and recycling activities.

Background

Electronics is one of the fastest growing waste streams. According to a study completed for the Department of Natural Resources in 2002, Iowans generated 274,000 obsolete personal computers in 2001. By 2005 that number is expected to double, meaning one computer will become obsolete for every new computer put on the market².

Electronics waste is of particular concern due to the potential hazards they possess through their composition, which may include hazardous or toxic components and materials. Leaded glass in computer monitors is the primary hazardous material noted, however, other heavy metals such as mercury and cadmium can be found in a variety of electronic equipment.

Several other states are also closely examining the issue of e-waste for the same reasons as Iowa - to evaluate and reduce the risk of lead, cadmium, mercury and other hazardous materials entering the environment.

School Electronics Collection Events

In May and June of 2003, the Department initiated a series of electronics collection events targeting Iowa schools and AEA offices. A letter was sent to all Iowa schools and AEA offices to determine their interest. Nearly 100 schools, school districts, and AEA offices responded.

The following table summarizes the type and weight of electronics received by each collection site in May and June 2003.

² Wuf Technologies, LLC, "Iowa Electronics Waste Characterization Study", Iowa DNR contracted study, 2002.

Host Collection Site	<u>Monitors</u>	TVs	CPUs	Other	Total (pounds)	<u>Number of Schools/ Districts/AEAs</u>
Clarinda	5,380	40	1,247	1,067	7,734	4
Council Bluffs	13,323	1,008	5,805	7,020	27,156	5
Cylinder	9,695	697	5,916	4,664	20,972	8
Davenport	16,406	1,207	2,049	8,361	28,023	3
Des Moines School District	26,895	1,439	3,808	16,730	48,872	1
Hiawatha	9,921	1,008	3,228	2,909	17,066	6
Marshalltown	10,445	250	2,433	7,374	20,502	16
New Hampton	13,425	300	5,958	4,457	24,140	10
West Des Moines	9,310	329	2,974	4,397	17,010	9
Total	114,800	6,278	33,418	56,979	211,475	62

The total cost for the nine collection events (including labor, transportation, recycling, and all supplies and materials) was \$54,173. The participating schools and AEA offices provided \$18,315 as their cost share, or 34% of the total project cost. Participants were charged \$5 to participate. If more than two cathode ray tubes (CRT) were delivered, then \$5 was charged for each additional CRT accepted for recycling.

These collection events resulted in more than 105-tons of electronics being reused and recycled. This includes a diversion of several hazardous materials, including nearly 10.5-tons of lead.

A follow-up letter to schools unable to participate in this collection event is planned to identify the reasons and barriers to their participation. Possible reasons for not participating could be the inconvenience of traveling to the collection site and the cost of participation.

Residential Computer Collection Events

During the fall of 2002, the Department sponsored a demonstration collection event for household computers in conjunction with a Toxic Cleanup Day (TCD) in Appanoose County, and a stand-alone collection event in Woodbury County.

Below are the results of those collection events.

	Monitors	TVs	CPUs	Other	Total (pounds)
Appanoose County	2,540	2,831	1,554	750	7,585
Woodbury County	3,942	6,855	1,259	2,172	14,228
Total	6,392	9,686	2,813	2,922	21,813

These collection events were intended to gauge the household interest in computer recycling. Participants were required to pay a participation fee of \$5, plus \$5 for each CRT after the third CRT they delivered to the event. These collection events resulted in more than 1,100 pounds of lead being diverted from disposal and back into the manufacturing stream through recycling.

Information learned from both collection events is being used to initiate a sustainable electronics recycling program across Iowa. This program is offering cities and counties grants to initiate on-going e-waste collection and recycling programs. The focus has shifted from Department-sponsored, one-day collection events to local programs operating on a continual, sustainable basis.

Local Sustainable Electronics Programs

The Department offered grants of up to \$10,000 to government entities establishing new programs focusing on the sustainable and ongoing management of electronic waste. These local programs will assist the Department in its efforts to increase recycling opportunities for electronics waste to Iowa citizens not currently served by a local program. Eligible participants included households, businesses, and schools.

The first round of grants were issued and five grant awards provided to the following entities:

Benton County Landfill

- Eligible electronics included computers, computer peripherals, and televisions.
- There was a \$10 fee for all computer monitors and \$15 for all televisions.
- Materials were collected at the county's RCC satellite facility.

Floyd-Mitchell-Chickasaw Solid Waste Management Agency

- Eligible electronics included computers, computer peripherals, televisions, and other audio and visual electronics.
- There was a \$5 fee for all computer monitors and televisions under 19-inches, and a \$15 fee for all televisions over 19-inches.
- Materials were collected at each county's RCC satellite facility.

Iowa City Landfill and Recycling Center

- Eligible electronics included computers, computer peripherals, televisions, and copiers.

- There was a \$5 fee for all computer monitors and portable television, and a \$15 fee for all console televisions and copiers.
- Materials were collected at the RCC satellite facility.

Metro Waste Authority

- Eligible electronics included computers, computer peripherals, televisions, and copiers.
- There was a \$0.35 per pound fee for materials.
- Materials were collected at the RCC's main facility, MWA's recycling center, and the landfill.
- Eligible participants included all households, businesses, and schools within the 19-county RCC service area.

Siouxland Regional Recycling Center (City of Sioux City)

- Eligible electronics included computers, computer peripherals, televisions, and small household electronics.
- There was a \$5 fee for all electronics, \$5 for each computer monitor or television after the 3rd delivered, and \$1 for each small household electronic item after the first five items.
- Materials were collected at the recycling facility located in Sioux City.

It is anticipated that a request for proposals will be issued at the beginning of 2004, soliciting applications to expand the number of local sustainable electronics programs in Iowa.

National Electronics Product Stewardship Initiative (NEPSI)

"Product Stewardship" is one of several terms that recognizes the need for industry, government, and consumers to promote the development and use of consumer products that pose no – or increasingly fewer – health and environmental impacts. To further this initiative, the Product Stewardship Institute (PSI) was founded in 2000. NEPSI is one of many targeted product-specific stewardship initiatives created by PSI to bring a multi-stakeholder group together to develop solutions to the issue of electronics product management.

The infrastructure for collecting, reusing and recycling electronics in the United States has not kept pace with this growing waste stream, and the number of electronic products entering the waste stream is projected to increase dramatically unless reuse and recycling options expand. NEPSI brings all stakeholders (federal, state and local governments, manufacturers, retailers, recyclers, and environmental groups) together to find a solution to this issue.

The main goal of the NEPSI dialogue is: "The development of a system, which includes a viable financing mechanism, to maximize the collection, reuse, and recycling of used electronics, while considering appropriate incentives to design products that facilitate source reduction, reuse and recycling; reduce toxicity; and increase recycled content."

This dialogue gives participants the opportunity to discuss potential solutions to the issues surrounding electronic products. Such solutions will encourage and require cooperation among stakeholders to improve the infrastructure for collection, reuse and recycling, to develop markets for remanufactured products and recycled materials, to remove regulatory barriers for collection and reuse and recycling, and to ensure that product designs facilitate reuse and recycling in the future.

The Department is a member of the Product Stewardship Institute, and has been an active stakeholder in the NEPSI dialogue since its beginning. In addition to participating in meetings and conference calls, the Department has been a member of working subcommittees and chaired the initiative to develop environmentally-sound management (ESM) guidelines for the NEPSI system.

Electronics Recycling Rules

In 2002, the Iowa Legislature passed Iowa Code Section 455D.6(7), which charged the IDNR to develop a strategy and administrative rules by January 1, 2004, for the recycling of electronic goods and the disassembly and removal of toxic parts from electronic goods. The administrative rules (IAC 567—Chapter 122 “Electronics Recycling”) implement permitting requirements for electronics recycling facilities and electronics collection facilities.

In developing the administrative rules, DNR utilized input from a multi-stakeholder advisory committee. The committee consisted of electronics recycling companies, landfill operators, the Iowa Recycling Association (IRA), the Iowa Society of Solid Waste Operations (ISOSWO), the Iowa Association of Business and Industry (ABI), and federal, state, and local government officials.

FY04 Activities

Priority initiatives planned for FY04 include the following:

- Implementation of the administrative rules (IAC 567—Chapter 122).
- Compliance assistance to regulated facilities.
- Continued involvement in the NEPSI dialogue process and related activities.
- Requests for proposals issued to establish additional sustainable electronics collection programs.
- Continuing e-waste as a SWAP (i.e. grant and low interest loan program) targeted waste stream.

Department Staff Contact Information

For more information about DNR’s electronics initiatives, please contact the following Energy and Waste Management Bureau staff: Merry Rankin at (515) 281-8263, or Theresa Stiner at (515) 281-8646.

Appendix C:

IOWA ELECTRONICS WASTE CHARACTERIZATION STUDY

EXECUTIVE SUMMARY

Submitted By:
Wuf Technologies, LLC, Concord, NH
March 2002

This study was undertaken in 2001 to address the significant waste management and environmental issues represented in the large and growing number of personal computers, computer monitors, televisions, and related equipment entering the Iowa waste stream. Computers and related electronic equipment are one of the fastest growing segments of the municipal and commercial waste stream, in Iowa and nationwide. Environmentally, they are a concern for several reasons, principally leaded glass in computer monitors, and lead, mercury, and other heavy metals in a wide variety of electronic equipment.

The study was designed to address a series of related questions:

1. How many computers are being discarded by Iowa residents and businesses?
2. What recycling options are available for used electronic equipment in Iowa? Is the availability of recycling options different for different generators?
3. What are the barriers to electronics recycling for Iowa generators? Are they different for different generators?
4. What equipment and which generators should be the highest priorities as the State considers attempting to expand the availability of recycling opportunities for electronics?
5. What policy options are available to the State to address these high priority generators and their electronic equipment wastes?

CURRENT ELECTRONIC EQUIPMENT WASTE GENERATION RATES

This study estimates that approximately 274,000 personal computers or their equivalents were generated as waste in Iowa in 2001. When related equipment including monitors, keyboards and mice are accounted for, this equates to an approximate quantity of 6,900 tons of electronic equipment waste. This value can be expected to double by 2005.

With an average of over 35 million units sold per year through the 1990's, the number of TVs purchased annually by American consumers is nearly triple the number of personal computers (despite the rapid growth in PC sales throughout the decade) (Electronic Industries Alliance, 1999). Therefore, the need and demand for TV recycling options is at least as great as demand for computer recycling options. This situation will be exacerbated in coming years as the TV industry and consumers convert fairly rapidly to high-definition television, a transition expected to begin by about 2003.

Table ES-1 Estimated Discards of Computers and Related Electronic Equipment in Iowa, 2001		
Sector	Estimated 2001 Discards, PCs or Equivalent	
	Number	Weight (Tons)
Commercial / Institutional	175,000	4,400
Residential	99,000	2,500
Total	274,000	6,900
Note: Estimated weight of approximately 50 lbs/system includes monitor (approximately 25 lbs) plus CPU, keyboard, and mouse (approximately 25 lbs).		

CURRENT ELECTRONIC EQUIPMENT MANAGEMENT PRACTICES

Commercial / Institutional Sector

Forty percent of 30 reporting firms donate some or all of their equipment or attempt to do so. Over half report that they dispose of all or some of their surplus computers and electronic equipment (CEE), or store it because they have no better alternative. Only two firms report third-party recycling as a means of disposing of surplus CEE. One-third of all firms reported that they use multiple means of disposing of used equipment.

A few broad patterns characterize the current status of CEE recycling in the private sector both in Iowa and the US.

- Larger firms tend to have more options in managing their electronic surplus than smaller firms. Smaller firms are more likely to report storage or disposal as their primary means of disposition.
- Large firms tend to have more disposition options.
- There is a definite trend toward leasing CEE, with integrated end-of-life takeback, particularly among large firms.
- Many firms don't have any sort of plan for disposing of surplus CEE, or reliable information about what disposition options are available.
- Donation absorbs only a small fraction of potentially available equipment, and is unlikely to develop into a major outlet for surplus electronics.

Residential Sector

Throughout the U.S. as in Iowa, residential electronics recycling is in its infancy. A detailed analysis by the Northeast Recycling Council identified fewer than 500 residential electronics recycling programs that have operated in the U.S. from 1998-2001 (Northeast Recycling Council, 2001).

In addition to government-organized recycling, four of the five major computer manufacturers and one nationwide retailer have initiated independent recycling programs for individual consumers (and small businesses). The national retailer Best Buy has also started the pilot phase of what it hopes eventually to establish as a nationwide recycling program, in which consumers can return equipment for recycling at participating stores on designated “recycling weekends.”

From the perspective of attempting to replicate the most successful of these programs in Iowa, two considerations are most important: participation and cost.

CURRENT STATUS OF THE ELECTRONICS RECYCLING INDUSTRY

With the exception of a few firms, the electronics recycling industry is less than ten years old, and is still evolving rapidly. Barriers to entry are relatively low, so that many new players have entered and continue to enter the industry. But the industry is complex, competitive, and subject to rapid change in its markets, with the result that industry exits are almost as common as new entrances.

There are many CEE recycling models, which fall along a spectrum ranging from simple resale to full-service “demanufacturing” (dismantling electronic equipment to recover components and commodities). In general, the highest profit margins in the industry are derived from resale of functioning, recent vintage equipment. Equipment that cannot be re-sold is generally either dismantled to recover working components (e.g., hard disks, memory), or shredded to recover basic commodities (e.g., metals, plastics). Non-profit recyclers are a significant part of the industry. Without exception, their primary goal is to secure functioning equipment which can be redistributed (with or without refurbish and upgrade) to needy individuals or organizations.

Iowa has five in-state computer recyclers that handle substantial volumes of equipment, and a number of smaller recyclers.

Additionally, three Iowa counties or waste districts (Linn County, Clinton County, and the Landfill of Northern Iowa Planning Area in Clear Lake) manage electronics collection or have run pilot programs.

Beyond this small number of public and private initiatives, there are no other meaningful recycling options for Iowa generators. Some number of local computer shops take used equipment from customers, Catholic Charities take equipment from a small number of generators, and some generators can make regular or sporadic donations to local schools, churches, and similar organizations. But none of these outlets, alone or in combination, amounts to a meaningful recycling option.

BARRIERS TO ELECTRONICS RECYCLING

In general, the barriers to electronics recycling can be grouped into four areas. In different combinations, these are what have impeded and continue to impede the expansion of electronics in all generating sectors — commercial, institutional, and residential. These barriers are:

1. **Law and Regulation:** The absence of any regulatory incentives or mandates directing surplus CEE out of the waste stream and toward recycling.

2. **Information.** The lack of information regarding the impacts of improper CEE management, and the lack of information about recycling alternatives.
3. **Collection:** The absence of infrastructure to collect equipment efficiently and cost effectively, and move it into recycling channels.
4. **Recycling Cost:** The high cost to recycle used equipment (particularly the environmentally problematical equipment such a computer monitors and televisions) in comparison to the cost of disposal.

The absence of law or regulation driving surplus CEE out of the waste stream and toward recycling is the single most significant barrier affecting all generating sectors. Until this barrier is removed, it is unlikely that the volume or proportion of surplus CEE diverted from disposal to recycling, in Iowa or elsewhere in the U.S., will increase more than incrementally.

The absence of in-state recyclers is not as significant a barrier as it might appear. Iowa's two larger commercial recyclers, have substantial additional capacity. And nearby states, particularly Minnesota and Illinois, are home to a concentration of electronics recycling organizations. Although long travel lanes add cost to electronics recycling for Iowa generators, recycling capacity itself is not a meaningful barrier.

LESSONS LEARNED FROM OTHER ELECTRONICS RECYCLING INITIATIVES

As Iowa considers options to improve electronics recycling opportunities for its residents and businesses, it can benefit from the experience of other state and local electronics recycling initiatives. Among the most important pieces of information that can be gleaned from recycling experience elsewhere in the country are the following:

1. Programs must be as convenient as possible to targeted participants, in terms both of timing and location;
2. To the maximum extent possible, CEE recycling should be linked to existing recycling programs. This will simultaneously enhance participation, reduce expenditures needed for publicity and education, and generate savings in setup and management expenses.
3. Collection events should use existing recycling drop-off sites whenever possible, to encourage participation and reduce costs.
4. Greater frequency encourages greater participation, and tends to reduce costs per participant and per ton of equipment collected for recycling (especially if events are linked to an existing recycling program).
5. Fees charged to participants at the time of recycling significantly discourage participation.
6. The more a consumer has to do (packaging, shipping, transporting to a remote location, etc.), the less likely he or she is to participate in CEE recycling.

POLICY OPTIONS TO IMPROVE ELECTRONICS RECYCLING IN IOWA:

OVERVIEW

Improving CEE recycling for residents and small businesses in Iowa will, almost certainly, entail policy action in three areas. It is difficult to envision the widespread development of CEE recycling opportunities if only one or two of these areas are addressed.

1. Action to mandate or encourage recycling over disposal for all or a fraction of the CEE waste stream;
2. Action to foster establishment of collection and recycling infrastructure;
3. Action to provide funding for CEE recycling.

RECOMMENDATIONS FOR IOWA

Waste Streams and Generators of Highest Importance

- Personal computers (including workstations, servers, etc.), computer monitors, and televisions are the items of greatest importance to divert from the waste stream.
- Individual residents and small businesses are the waste generating sectors that should be served by publicly supported electronics recycling.

Options To Provide Collection And Recycling Infrastructure

Wuf Technologies believes that the following options match up best against the criteria that tend to promote successful and cost effective recycling of surplus electronic equipment for consumers and small businesses:

1. **Drop-off at Local Recycling Drop-off Locations**
2. **Drop-off or Curbside Collection During Local Spring Cleanup Days**
2. **Drop-off at Local/Regional Recycling Centers**

Options To Fund Statewide Electronics Recycling

Wuf Technologies believes that the following options offer the greatest promise to provide a stable funding source for electronics recycling, and fairly allocate costs among the parties with an interest in the success of this effort.

One of the most significant features of these options, which they have in common, is that the ultimate payment for electronics recycling is shared between the generators of electronic waste and product manufacturers. This approach represents a commitment toward shared financial responsibility for end-of-life management of electronic products which has been widely discussed, but which has not yet been implemented in any jurisdiction in the U.S.

1. **Advance Disposal Fee with Manufacturer Merchandise Rebate to Consumer**
2. **Advance Disposal Fee with Manufacturer Match**
3. **Capture of Sales Tax Revenues with Manufacturer Match**

FUTURE CONSIDERATIONS

It is unlikely that CEE recycling opportunities for residents and small businesses will develop without action on the part of Iowa's legislature. The economics of recycling and disposal will continue to favor landfilling of used electronic equipment in Iowa. And to the extent that the private recycling industry continues to develop, its primary beneficiaries will be large businesses and institutions. Iowa cannot expect national legislation or regulatory action to address the issue; meaningful action will have to be initiated within the State.

If Iowa chooses to pursue legal and/or regulatory action to implement CEE recycling, it can do so on one of three levels — by establishing pilot recycling programs, by promulgating legislation that encourages electronics recycling, or by promulgating legislation that mandates electronics recycling.

Appendix D:
2003 ELECTRONICS STEWARDSHIP LEGISLATION
Prepared by Jerry Powell, E-scrap News, 2003³

California

SB 20 A producer responsibility measure, this bill requires that OEMs establish and fund a free recycling program for products containing hazardous materials, such as lead, silver and cadmium. Producers, such as out-of-state or small firms, would have the option of paying a fee on sales in California to fund a recycling system run by others. A 50-percent recycling level is mandated for 2005, rising to 90 percent by 2010. 12/02/2002 introduced as spot bill. 01/08/2003 to senate committee on rules. Issued in rewritten form 5/06/03. Committee hearing 5/12/03. Signed into law 9/25/03.

http://www.leginfo.ca.gov/pub/bill/sen/sb_0001-0050/sb_20_bill_20021202_introduced.html

AB 1174 Existing law requires the California Integrated Waste Management Board to administer state programs to recycle plastic trash bags, plastic packaging containers, waste tires, newsprint, and other specified materials. This bill would define "electronic waste" for the purposes of those provisions. *Status: First read 2/03*

http://www.leginfo.ca.gov/pub/bill/asm/ab_1151-1200/ab_1174_bill_20030221_introduced.html

Connecticut

HB 6259 That the general statutes be amended to establish a recycling program for certain electronic devices and to impose a recycling fee to fund the program. Stated purpose is to impose a recycling fee to fund the program. Stated purpose is to reduce a source of lead in the environment for which no collection system currently exists. There are no details available for this bill – it will be fleshed out in hearings by the committee. 01/27/03 introduced. 01/28/03 to Joint Committee on Environment.

http://www.cga.state.ct.us/asp/CGABillStatus/CGAbillstatus.asp?selBillType=Bill&bill_num=HB6259

HB 6267 Concerns a recycling program for electronic devices; reduces a source of lead in the environment for which no collection system currently exists. 01/27/2003 introduced. 01/28/03 to Joint Committee on Environment.

http://www.cga.state.ct.us/asp/CGABillStatus/CGAbillstatus.asp?selBillType=Bill&bill_num=HB6267

³ Web site links were current at the publication of this report, but they may not be current at the time of your reading.

HB 6269 Concerns a recycling program for certain electronic devices and establishes a recycling program for electronic devices that contain cathode ray tubes. 01/27/2003 introduced. 01/28/2003 to Joint Committee on Environment.

http://www.cga.state.ct.us/asp/CGABillStatus/CGAbillstatus.asp?selBillType=Bill&bill_num=HB6269

Florida

SB 674 Mandates electronics takeback; allows for repeal if there is a national law or program; covers: including but not limited to: cathode ray tubes, mercury-containing lamps, central processing units, laptop computers and peripherals, radios, disc/tape recorders & players, fax machines, portable telephones, answering machines, electronic game consoles, PDAs, and other products that are “designed for transmitting sound, images, or other information by telecommunication.” Imposes an advance recycling fee of \$10 (as of January 1, 2004) on each covered product and requires sellers to notify customers of the fee either on the cash receipt or by prominent signage. Funds would go to counties with EPA-approved electronic recycling programs. Additionally, as of January 1, 2004 counties would impose a surcharge (to be determined) on solid waste disposal fees to help fund their electronics recycling programs. As of January 1 2006, each marketer who sells or distributes electronic products must implement a product collection system without imposing additional costs on the purchaser, and inform each purchaser of the method by which product can be returned for proper disposal. Annual reporting on the collection system must be made after January 1, 2007. 02/04/03 introduced.

http://www.flsenate.gov/cgi-bin/view_page.pl?File=sb0674.html&Directory=session/2003/Senate/bills/billtext/html&Tab=session&Submenu=1

SB 678 Creates an electronics recycling account in the Solid Waste Management Trust Fund to provide funding for grants to entities establishing comprehensive electronics recycling programs. The moneys in the electronics recycling account shall be disbursed according to 403.7185 as grants to counties for establishing programs for recycling electronics products and components. SB 678 also provides for future review and termination or recreation of the account and provides a contingent effective date of July 1, 2003.

http://www.flsenate.gov/cgi-bin/view_page.pl?File=sb0678.html&Directory=session/2003/Senate/bills/billtext/html&Tab=session&Submenu=1

Electronics End-of-life in Florida: <http://www.dep.state.fl.us/waste/categories/electronics/>

Georgia

HB 133 Amends article 4 of Chapter 5 of Title 50 of the Official Code of Georgia Annotated, and provides that disposal of surplus state property include bidding and sale of computers and other electronics. 01/27/03 introduced. 01/27/03 to House Committee on Governmental Affairs.

http://www.legis.state.ga.us/legis/2003_04/sum/hb133.htm

Hawaii

SB 29 Directs Department of Health to adopt rules establishing a cathode ray tube recycling program by 07/09/2008. A landfill ban would then take effect. Passed Senate March 4.

<http://www.capitol.hawaii.gov/site1/docs/getstatus2.asp?billno=SB29>

Illinois

HB 1165 Amends the Environmental Protection Act. Creates the Computer Equipment Disposal and Recycling Commission. Requires that the Commission (i) issue a report of its findings and recommendations related to the disposal and recycling of computer equipment on or before May 31, 2004 and (ii) beginning on May 31, 2005, evaluate the implementation of programs by the state relating to computer equipment disposal and recycling, and shall issue a report of its finding. 02/04/03 introduced. Passed both Houses. To Governor 6/13/03. Vetoed. May be added to Veto Session in November 2003.

<http://www.legis.state.il.us/legislation/BillStatus.asp?DocNum=1165&GAID=3&DocTypeID=HB&LegId=1736&SessionID=3>

Maine

LD 590 This bill bans the disposal of cathode ray tubes in landfills and incinerators beginning January 1, 2006; establishes a multi-stakeholder group to develop a recommended shared-responsibility recycling plan. Signed into law.

<http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280008753&LD=590&Type=1>

LD 743 An act to protect public health and the environment through the collection and recycling of electronic waste. The measure would place responsibility on manufacturers for developing and financing, within two years, a collection and management system for their own brand, and orphan and historic wastes by market share at the time the waste costs are incurred.

Manufacturer compliance plans are required within six months, and financial assurances are required within 12 months. The bill bans electronics from landfills and incinerators, and phases out the use of toxics by 2006 (unless proven to be technically unfeasible), and limits exports to OECD-member countries. Status: *Killed by Natural Resources Committee.*

<http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280008950&LD=743&Type=1>

LR 1194 protects public health through the collection and recycling of electronic waste.

Maryland

HB 911 Prohibiting any person from disposing of a cathode ray tube (CRT) from a computer monitor or television in any location not designated by the Department of the Environment for the management and recycling of used CRTs on or after December 31, 2004; prohibiting any sanitary landfill, solid waste transfer station, or incinerator from accepting a CRT on or after that date; requiring the Office of Recycling to develop a method for the management and recycling of used CRTs; authorizing the Department to adopt regulations; etc. Status: *In Committee 2/03*
<http://mlis.state.md.us/2003rs/billfile/hb0911.htm>

Massachusetts

House Bill 1533 A bill was introduced in the state house that would require cathode ray tube makers to either participate in a national takeback system or finance all recycling collection directly. The bill, now before the Joint Committee on Natural Resources and Agriculture, would require that manufacturers provide a state-approved collection plan that will not cost state or local governments anything. In the alternative, they could prove they are participating in a national takeback plan, which would alleviate the need for local governments to finance collection.
<http://www.state.ma.us/legis/history/h01533.htm>

Michigan

HR 24 urges the state Department of Environmental Quality to conduct an assessment by December 1, 2003 of the unregulated electronic waste stream generated in the state and of the state's capacity for managing this waste. It also requires the agency to establish an electronics recycling strategy and a public education program.

H 4296 Prohibits the disposal of products containing cathode ray tubes in landfills beginning January 1, 2004; requires the state environmental agency to establish a multi-stakeholder task force to report to the legislature on regulatory problems related to electronics and CRTs. *Status: Passed House 10/2003.*
<http://michiganlegislature.org/documents/2003-2004/billintroduced/house/hm/2003-HIB-4296.htm>

SB 147 Prohibits disposal of consumer electronics, such as televisions and computers, in landfills; instructs the state environment agency to conduct a study on electronics recycling and report to the legislature; and instructs the agency to establish standards for electronics recyclers. 02/04/03 introduced. 02/04/03 to Senate Committee on Natural Resources and Environmental Affairs.
<http://michiganlegislature.org/documents/2003-2004/billintroduced/senate/pdf/2003-SIB-0147.pdf>

Minnesota

House File 882 prohibiting the placement in mixed municipal solid waste of electronic products with cathode ray tubes; establishing a process for a list of electronic products complying with certain standards for recovery and recycling; providing immunity for certain anticompetitive conduct for manufacturers that participate in collection and management programs for waste electronic products; proposing coding for new law in Minnesota Statutes, chapter 115A. Status: *Introduced 3/13/03*

http://www.revisor.leg.state.mn.us/cgi-bin/getbill.pl?session=ls83&version=latest&number=HF882&session_number=0&session_year=2003

Senate File 838 bans CRTs from disposal by July 1, 2005; requires all manufacturers to be responsible for collecting and recycling electronic products; producers cannot charge end-of-life fees for such efforts; producers must submit compliance plans to the state; also must submit annual progress reports indicating sales and recovery levels and end-use markets. The measure was passed unanimously by the Senate environment committee (March 20) and then unanimously by the Senate judiciary committee (April 3).

Legislative budget bill. As part of the Omnibus Environmental Funding package, the following language was inserted: "Effective July 1, 2005, a person may not place in mixed municipal solid waste an electronic product containing a cathode ray tube." This was approved by both houses and signed into law.

Mississippi

SB 2398 The "Mississippi Computer and Electronic Solid Waste Management Act" requires that each state agency prepare and implement a policy for the management and sale of surplus computers and peripherals, and outlines the procedures for processing, reusing and recycling electronic waste generated by state agencies. Among other provisions, the act also establishes a Computer and Electronic Recycling Fund, and earmarks 25% of any proceeds from the sale of computer and electronic equipment to the fund.

<http://billstatus.ls.state.ms.us/documents/2003/html/SB/2300-2399/SB2398IN.htm>

Nebraska

LB 301 Adopts the Electronic Equipment Recycling Act and creates the Electronic Equipment Recycling Program. Imposes a fee of \$10 on the sale of every new item of electronic equipment that contains a cathode ray tube. Funds will be used to establish the Electronic Equipment Recycling Enforcement Fund. Institutes a ban against disposing of electronic equipment as including but not limited to: televisions, audio and stereo equipment, monitors, computers, video cassette recorders, computer keyboards, printers, telephones, copy and facsimile machines and microwave ovens. Provision is made to hire a contractor to develop and implement a program to

establish a statewide system of determining the most efficient means to dispose of electronic equipment. The program will also work with local governments and businesses, develop public education programs and provide grants to electronic recycling businesses, as well as offer grants to local governments and solid waste facility operators to cover processing and recycling costs assessed by authorized electronic equipment recyclers. 01/12/2003 introduced. 01/14/2003 to Legislative Committee on Natural Resources; passed out.

<http://www.unicam.state.ne.us/scripts/InfoRon.asp>

New Hampshire

HB 73 Establishes a committee to study imposing a recycling fee on new computer purchases to be presented to the governor and others by November 1, 2003. 01/08/2003 to House Committee on Environment and Agriculture.

<http://www.gencourt.state.nh.us/legislation/2003/HB0073.html>

New Mexico

House Bill 58 requests the state environmental agency study and make recommendations on the disposal of computers. Passed House and Senate. <http://legis.state.nm.us>

New York

Assembly Bill 637 Requires that all new computers and accessories sold must contain only new components unless labeled otherwise, establishes label requirements, and permits the Attorney General to seek injunctive relief and civil penalties. Also authorizes the right of private action. 01/09/2003 Introduced. 01/09/2003 to assembly committee on consumer affairs and protection.

<http://assembly.state.ny.us/leg/?bn=A0637>

Assembly Bill 3073 Directs the commissioner of environmental conservation to promulgate rules and regulations providing for the recycling, reuse, and remanufacturing of electronic equipment; defines electronic equipment. 02/02/02 introduced. 02/03/03 to Assembly Committee on Environmental Conservation. Approved March 2003. To Senate Rules Committee June 19, 2003.

<http://assembly.state.ny.us/leg/?bn=A3073>

Assembly Bill 3075 Requires every business engaged in the retail sale of disposable cellular telephones to accept, at no charge, used models of such telephone or recycling or reuse subject to the regulations of the commissioner of environmental conservation; prohibits any person from disposing of or incinerating a disposable cellular telephone. 02/03/03 introduced. 02/03/03 to Assembly Committee on Environmental Conservation. Passed Assembly 147-0 on June 16, 2003; sent to Senate Rules Committee. <http://assembly.state.ny.us/leg/?bn=A03075>

Assembly Bill 3633 Enacts the "electronic equipment recycling act"; establishes an electronic equipment recycling program within the department of environmental conservation to develop and implement the most efficient means of collecting, storing, transporting, processing and recycling electronic equipment which contain hazardous materials; provides assistance for development of electronic equipment recycling programs through the department of environmental conservation and the office of waste prevention services; prohibits the discarding of cathode ray tubes in landfills; imposes civil penalties for violations of such provisions; provides all penalties collected pursuant to such act shall be deposited in the environmental protection fund for use in implementing the provisions of this act. *Status: in committee 2/2003 (same as S 890?)*
<http://assembly.state.ny.us/leg/?bn=A03633>

Assembly Bill 3770 Prohibits the sale of disposable cellular telephones and imposes a civil penalty of not more than \$250 for a violation of such provisions. *Status: Referred to consumer affairs and protection 2/03*
<http://assembly.state.ny.us/leg/?bn=A03770>

Assembly Bill 5302 Imposes a \$10 fee upon the retail sale of cathode ray tubes; prohibits the disposal and the acceptance for disposal of cathode ray tubes in mixed solid waste; imposes civil penalties for violations of such provisions; provides that all fees and civil penalties collected pursuant to such act shall be deposited in the solid waste account of the environmental protection fund for use in electronic equipment recycling programs.
<http://assembly.state.ny.us/leg/?bn=A05302>

Assembly Bill 6096 prohibits the disposal of electronics and requires manufacturers to provide recycling collection and disassembly; provides a public education program.

Senate Bill 890 Enacts the "electronic equipment recycling act"; establishes an electronic equipment recycling program within the department of environmental conservation to develop and implement the most efficient means of collecting, storing, transporting, processing and recycling electronic equipment which contain hazardous materials; provides assistance for development of electronic equipment recycling programs through the department of environmental conservation and the office of waste prevention services; prohibits the discarding of cathode ray tubes in landfills; imposes civil penalties for violations of such provisions; provides all penalties collected pursuant to such act shall be deposited in the environmental protection fund for use in implementing the provisions of this act. *Status in committee 2/2003*
<http://assembly.state.ny.us/leg/?bn=S00890>

Senate Bill 897 Directs the commissioner of environmental conservation to promulgate rules and regulations providing for the recycling, reuse, and remanufacturing of electronic equipment; defines electronic equipment. 01/23/03 introduced. 01/23/03 to Senate Committee on Environmental Conservation.
<http://assembly.state.ny.us/leg/?bn=s0897>

Senate Bill 902 Creates a personal income tax credit for the fees imposed by recyclers for the taxpayer; defines “electronic equipment”. 01/23/03 introduced. 01/23/03 to Senate Committee on Investigations, Taxation and Government Operations.

<http://assembly.state.ny.us/leg/?bn=s0902>

Senate Bill 903 Requires every business engaged in the retail sale of disposable cellular telephones to accept, at no charge, used models of such telephone or recycling or reuse subject to the regulations of the commissioner of environmental conservation; prohibits any person from disposing of or incinerating a disposable cellular telephone. 01/23/03 introduced 01/23/03 to Senate Committee on Consumer Protection.

<http://assembly.state.ny.us/leg/?bn=s0903>

North Carolina

Senate Bill 970 and **House Bill 878** are reintroductions of a measure from 2002. The bills call for a \$10 retail fee on CRTs, with local governments reimbursed \$10 for each recovered CRT. Infrastructure grants also will be funded. The measures call for the certification of electronics processors. A disposal ban would take place in 2007.

Oregon

House Bill 2971 bans the disposal of cathode ray tubes. In addition, the measure assesses a \$50 fee on the sale of new monitors and televisions containing CRTs, with monies flowing to a state CRT recycling fund. Each new monitor and TV would have to have a unique label affixed to it, with the state environmental agency managing a registry of the label numbers. The CRT program funds would be used to certify CRT recycling plants, pay consumers \$25 if they deliver their obsolete registered CRT to such a center, and help subsidize the cost of recycling those CRTs.

House Bill 3563 places a \$3 fee on the sale of electronic products, including televisions, cathode ray tubes and computers. An Electronic Products Account is established to build a sustainable infrastructure for reclaiming and disposing of electronics.

SB 867 creates an Electronic Products Stewardship Advisory Committee to work with the state community and economic development agency to assess a sustainable electronic products recycling and disposal program. The measure also requires a pilot recycling and reuse project by Metro, the Portland-region waste management agency. The bill passed the Senate unanimously and the House by 42 to 9. http://pub.das.state.or.us/LEG_BILLS/PDFs_2001/SB867.pdf

Rhode Island

H 5783 and **H 5829** would create the electronic waste producer responsibility act designed to regulate the disposal of electronic waste. Within two years of enactment, manufacturers would have to implement a program to finance an electronics recycling system; consumers cannot be charged for such service; producers failing to take part would be barred from selling in the state; compliance plans are required within six months of enactment; electronic waste is banned from disposal and incineration; use of toxic substances is banned within 12 months; electronic scrap cannot be processed by prison inmates unless they are paid prevailing wages; electronic scrap cannot be exported; Status: *In Committee 2/03*

<http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H5783.htm>

<http://www.rilin.state.ri.us/BillText/BillText03/HouseText03/H5829.htm>

S 234 This act would prohibit the sale of cathode ray tubes until manufacturers establish collection system for old CRTs. Status: *In Committee 2/03*

<http://www.rilin.state.ri.us/BillText/BillText03/SenateText03/S0234.htm>

South Carolina

SB 148 A Joint Resolution to establish the Electronic Equipment Recycling Program to be administered by the Recycling Market Development Advisory Council within the Department of Commerce. Imposes a \$5 fee on each cathode ray tube containing device sold, and requires the State Treasurer to deposit the fees collected in the Electronic Equipment Recycling Fund. 01/08/2003 to Senate Committee on Agriculture and Natural Resources. 01/14/2003 introduced. 01/14/2003 to Senate Committee on Agriculture and Natural Resources.

http://www.scstatehouse.net/sess115_2003-2004/bills/148.htm

Texas

HB 595 Provides for the recycling of electronic devices including computers, printers, copiers, televisions and monitors, fax machines and video games, and any device containing a computer chip or circuit board. Exceptions can be made for those devices deemed harmless. Imposes fees to be collected by wholesalers and manufacturers at the time of sale. Fees are set according to predetermined classification of the items based on level of disposition costs involved in disposal of that type of device. Funds accrued will go to the "electronic equipment disposition account" to pay approved recyclers, and for grants and loans for research and facilities upgrades. Forbids landfilling of affected products, and requires disposal be made by registered electronic equipment disposition specialists. Fines to be imposed for improper disposal. Anyone illegally disposing or exporting e-waste would be subject to Class C misdemeanor charges. 01/28/03 introduced.

<http://www.capitol.state.tx.us/tlo/78R/billtext/HB00595I.HTM>

Senate Bill 1239 and **House Bill 2967** are identical measures which add electronics scrap to the definition of household hazardous waste and require manufacturers to establish a recycling system. Compliance plans would be required to be submitted to the Texas Commission on Environmental Quality. Producers could not use prison recycling operations, or export scrap.

Senate Bill 912 relates to the disposition of the state's surplus and recyclable computer equipment. Introduced on March 3, 2003. Passed Senate April 10, 2003. Passed House May 16, 2003. Signed by the governor June 20, 2003.

Utah

HB 67 Sets up an educational initiative on electronic waste in the state. 01/20/03 introduced. 01/20/03 to House Committee on Public Utilities and Technology: reported favorably as amended.

<http://www.le.state.ut.us/~2003/htmdoc/hbillhtm/HB0067.htm>

Vermont

HB 343 requires electronics producers to establish and finance e-scrap recovery programs; bars firms failing to comply from selling in the state; bans e-waste landfilling and incineration; requires use of alternatives to toxic substances; and establishes state electronics procurement standards.

Virginia

HB 2375 Requires the department of Environmental Quality to adopt regulations to provide for an electronic equipment recycling program. Requires the program to work with local government and businesses to determine how to recycle electronic equipment and to promote recycling and donating electronic equipment and bans the disposal of cathode ray tubes in mixed solid waste. 01/08/2003 introduced. 01/08/2003 to House Committee on Agriculture, Chesapeake and Natural Resources. 01/29/03 from House Committee on Agriculture, Chesapeake and Natural Resources: Reported as substituted, see HB 2376.

<http://leg1.state.va.us/cgi-bin/legp504.exe?031+sum+HB2375>

HB 2376 Requires the Department of Environmental Quality to adopt regulations to provide for a cathode ray tube special wastes recycling program. Bans the disposal of cathode ray tubes in landfills or incinerators, or mixed municipal solid waste beginning January 1, 2004. 01/08/2003 introduced. Committee substitute printed. 01/31/03 Committee substitute adopted House floor. 01/31/03 engrossed by House as substituted. Status: *Passed both Senate and House 2/03. Signed into law.*

<http://leg1.state.va.us/cgi-bin/legp504.exe?031+sum+HB2376>

Washington

HB 1942 Declares that, except as provided in this act, every manufacturer must develop, submit to the department, implement, and finance the implementation of a plan for the collection and the recycling or reuse of sixty-five percent, by weight, of all electronic waste from its own products each year. Consumers cannot be charged for recycling. The plan must provide and promote convenient, strategically located fixed collection sites to serve urban and rural populations throughout the state. Provides that all plans required by this chapter must be submitted to the department and the advisory committee by September 30, 2004, and reviewed by the department by December 31, 2004, with implementation by manufacturers beginning by June 30, 2005. Status: In committee 2/03; to be held over to 2004 session, with interim committee to be assigned.

<http://www.deq.state.va.us/recycle/computer.html>