

E-Waste Recycling Programs¹

This IPRO report presents an overview of electronic-waste recycling programs across the United States.

Definitions

Electronic waste (e-waste): outdated, unwanted, or broken electronic appliances (e.g. computers, cell phones, copiers, fax machines, monitors, printers, scanners, stereos, televisions, video game consoles).²

Extended producer responsibility model: The manufacturer pays to collect and recycle electronic products.³

Advanced recycling fee model: Consumers pay a fee to retailers at the point of purchase. This fee is deposited in a statewide recycling fund.⁴

Background

Since 2000, Electronic-waste (e-waste) has accumulated as technology is continually updated and gadgets become obsolete. E-waste is a rapidly growing waste stream and with few disposal regulations in place, much of it ends up in landfills. According to the EPA, the United States generated 2.63 million tons of e-waste in 2005. Of this waste, 88 percent went into the landfill or was burned by incinerators and approximately 12 percent was recycled. Currently, no federal legislation exists to regulate e-waste. To date, 24 states have adopted e-waste recycling programs.⁵

Costs and Benefits of State E-Waste Recycling Programs

Costs

Financial Cost

E-waste recycling imposes additional costs upon manufacturers and customers. E-waste programs necessitate collection, transportation, and recycling of covered products; internal compliance costs such as tracking, reporting, and registration; and government-incurred administrative costs.⁶ Under California's advanced recycling fee model, consumers pay an

¹ This report was prepared by University of Iowa undergraduate students Katherine Valde (katherine-valde@uiowa.edu) and Liza Minor (elizabeth-minor@uiowa.edu).

² Oleen, Brooke. "Reduce, Reuse, and Recycle: Managing E-Waste." *National Conference of State Legislatures*. Apr/May 2008. Web. 9 Sept. 2011. <<http://www.ncsl.org/?TabId=22063>>.

³ "E-Waste Recycling Legislation." *National Conference of State Legislatures*. Feb. 2011. Web. 9 Sept. 2011. <<http://www.ncsl.org/?tabid=22239>>.

⁴ Ibid.

⁵ Ibid.

⁶ "Benefits and Barriers to Electronic Waste Collection Models." *Sustainable Cities Institute*. Web. 10 Sept. 2011 <http://www.sustainablecitiesinstitute.org/view/page.basic/class/feature.class/Lesson_Benefits_Barriers_EWaste_Coll>.

additional \$6-10 fee at sale to cover the costs of recycling.⁷ For manufacturers, costs range from \$2.50 for small pieces, such as cell phones and printers, to \$15 for larger monitors.⁸

Infrastructure

Implementing a statewide e-waste recycling program requires the construction of new recycling collection sites and adequate storage facilities. In Iowa, there is a shortage of statewide coverage of local drop-off centers and many of these sites lack the storage capacity necessary to handle increased waste streams as well as truck loading capabilities.⁹ A statewide e-waste recycling program would also increase staffing needs, as uncontrolled drop-off is not acceptable for electronics.¹⁰ The Manufacturer's Coalition for Responsible Recycling reports that sorting e-waste by brand, under the extended producer responsibility model, also imposes additional costs and time on manufacturers.¹¹

Benefits

Health

Electronics contain toxic materials such as heavy metals, brominated flame-retardants (BFRs), polyvinylchloride, plastics, and gases that can be health hazards. Chemicals released from incinerators and leached from landfills can contaminate groundwater and air. Human exposure to lead, mercury, cadmium, and BFRs has documented health risks such as brain and kidney damage. Reusing and recycling materials from retired electronics conserves natural resources, avoids air and water pollution, and reduces greenhouse gas emissions caused by manufacturing new products.¹² About 40 percent of heavy metals in landfills come from e-waste.¹³ E-waste recycling diverts these materials from the landfill.

Social impact

E-waste recycling programs properly dispose of unwanted materials rather than externalizing waste to other nations. The Department of Commerce reported that between 50 and 80 percent of United States e-waste collected is exported overseas for disposal, often to China and India.¹⁴ These countries often lack the capacity to safely handle and dispose of e-waste. Electronics are sometimes dismantled for the scrap metal or burned, causing exposure to

⁷ "E-Waste Recycling Legislation." *National Conference of State Legislatures*. Feb. 2011. Web. 9 Sept. 2011. <<http://www.ncsl.org/?tabid=22239>>.

⁸ Ibid.

⁹ "Iowa Electronics Waste Characterization Study." *Iowa Department of Natural Resources*. Mar. 2002. Web. 25 Sept. 2011. <<http://www.iowadnr.gov/Environment/LandStewardship/WasteManagement/Residential/Recycling/Ewaste>>.

¹⁰ Ibid.

¹¹ Thompson, David. Statement to the House Committee on Energy and Commerce Subcommittee on Environment and Hazardous Materials. 8 Sept. 2005 Available at: <www.electronicrecycling.org/UserDocuments/Thompson.doc>. Accessed: 25 Sept. 2011.

¹² "Electronics: Waste Prevention, Reuse, and Recycling." *Indiana Department of Environmental Management*. Web. 24 Sept 2011. <<http://www.in.gov/recycle/5721.htm>>.

¹³ "Green Chemistry vs. Toxic Technology." *Electronics Take Back Coalition*. Web. 9 Sept. 2011. <<http://www.electronicstakeback.com/toxics-in-electronics/>>.

¹⁴ "Responsible Recycling vs. Global Dumping." *Electronics Take Back Coalition*. Web. 9 Sept. 2011. <<http://www.electronicstakeback.com/global-e-waste-dumping/>>.

harmful toxins in the process. Low labor costs and lack of environmental controls abroad lead to unsafe recycling. This is managed through state e-waste recycling programs.

State Action

Nearly all states with e-waste laws, 23 out of 24, require manufacturers to pay the costs of recycling. California, the first state to adopt legislation, is the only state that requires consumers to pay a small fee for disposal.¹⁵

California

California enacted the first e-waste legislation in 2003 using the advanced recycling fee model. Consumers are required to pay retailers a fee of \$6 to \$10 when they purchase a television or a computer, varying according to screen size. Retailers transfer the fees to an account that is distributed to pre-approved recyclers.¹⁶ All e-waste is banned from the landfill (see Table 1). The California Department of Resources, Recycling and Recovery provides an Electronic Product Management Directory to aid citizens with locating proper recycling sites based on the type of material, the county, or the facility name.¹⁷

Minnesota

In 2007, Minnesota's electronic recycling legislation, using the extended producer responsibility model, was signed into law targeting the collection and recycling of video display devices sold to households and consumers, including computer monitors, televisions, and other devices meeting the statute definitions. Only TVs and TV monitors are banned from the trash (see Table 1). Manufacturers of video display devices must annually register and pay a fee to the state, collect and recycle covered electronic devices from households and consumers, and file a report detailing the results of their collections for each program year.¹⁸ In the first year of the program, over 2,750 tons of e-waste was collected from Hennepin County, population is approximately 1.1 million.^{19,20}

Iowa

Iowa has not passed e-waste recycling legislation nor does it have any pending bills regarding disposal. Iowa is one of the five states in the Midwest that does not have an e-waste law. One-third of all states with e-waste legislation reside in the Midwest.²¹ Three in-state recyclers handle most of the used electronics that are recycled in Iowa. Two for-profit recyclers are Midwest Computer Brokers in Cedar Rapids and A-Tec Recycling, Incorporated in Des Moines. The REACT Center in Cedar Rapids is a non-profit computer

¹⁵ "E-waste Recycling Legislation." *National Conference of State Legislatures*. February 2011. Web. 11 September 2011. <<http://ncsl.org>>.

¹⁶ "The Greening of Landfills: Protecting Public Health by Recycling E-Waste." *National Conference of State Legislatures*. 31 March 2008. Web. 11 September 2011. <<http://ncsl.org>>.

¹⁷ "Electronic Product Management Directory." *California Department of Resources Recycling and Recovery*. Web. 11 September 2011. <<http://calrecycle.ca.gov>>.

¹⁸ "Minnesota's Electronics Recycling Act." *Minnesota Pollution Control Agency*. 8 September 2011. Web. 23 September 2011. <<http://www.pca.state.mn.us>>.

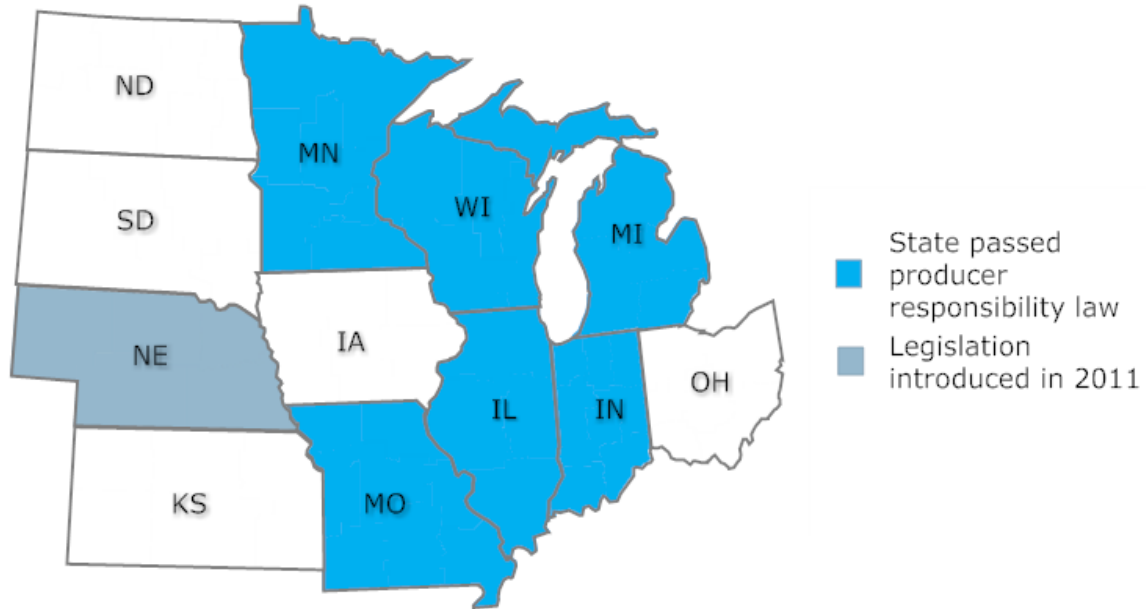
¹⁹ "Electronics Recycling in Hennepin County." *Minnesota Solid Waste Administrators Association*. 11 September 2008. Web. 23 September 2011. <<http://swaa-mn.org>>.

²⁰ Hennepin County population is 1,122,093.

²¹ "Brief Comparison of State Laws on Electronics Recycling." *Electronics Take Back Coalition*. 13 June, 2011. Web. 11 September 2011. <<http://electronicstakeback.com>>.

recycler managed by Rockwell Collins.²² Disposal options are also provided through take-back programs, notably the Best Buy Take Back.²³

Figure 1²⁴
Midwest States with E-waste Legislation



²² "Iowa Electronics Waste Characterization Study." *Iowa Department of Natural Resources*. Mar. 2002. Web. 25 Sept. 2011.
<<http://www.iowadnr.gov/Environment/LandStewardship/WasteManagement/Residential/Recycling/Ewaste>>.

²¹Ibid.

²⁴ "State Legislation." *Electronics Take Back Coalition*. Web. 11 September 2011.
<<http://electronicstakeback.com>>.

Table 1^{25, 26}

States with Laws Banning Certain E-waste from the Trash

State	Date Signed into Law	Extended Producer Responsibility	Advanced Recycling Fee
California*	2003		X
Connecticut	2007	X	
Hawaii	2008	X	
Illinois	2008	X	
Indiana	2009	X	
Maine	2004	X	
Maryland	2005	X	
Michigan	2008	X	
Minnesota	2007	X	
Missouri	2008	X	
New Jersey	2008	X	
New York	2010	X	
North Carolina	2007	X	
Oklahoma	2008	X	
Oregon	2007	X	
Pennsylvania	2010	X	
Rhode Island	2008	X	
South Carolina	2010	X	
Texas	2007	X	
Vermont	2010	X	
Virginia	2008	X	
Washington	2006	X	
West Virginia	2008	X	
Wisconsin	2009	X	

*Note: California is the only state that uses the advanced recycling fee model.

This report was prepared in October 2011 by the Iowa Policy Research Organization (IPRO), a non-partisan public policy undergraduate group at the University of Iowa. For additional research on this or other issues, please visit our website at <http://www.uiowa.edu/~ipro/> or contact rene-rocha@uiowa.edu

²⁵ “States Where You Can’t Throw E-waste Into the Trash.” *Electronics Take Back Coalition*. 27 September 2011. Web. 2 October 2011. <<http://electronicstakeback.com>>.

²⁶ “E-Waste Recycling Legislation.” *National Conference of State Legislatures*. Feb. 2011. Web. 9 Sept. 2011. <<http://www.ncsl.org/?tabid=22239>>.