



E-Cycle Wisconsin 2013 report

*Wisconsin DNR annual report to the Legislature
and governor under s. 287.17(10), Wis. Stats.*

December 2013

Executive summary

Wisconsin's electronics recycling law took effect Jan. 1, 2010, when manufacturers of certain consumer electronics were required to collect and recycle electronics from Wisconsin households and schools under the E-Cycle Wisconsin program. Beginning Sept. 1, 2010, many consumer electronics—including TVs, computers, printers and cell phones—could no longer be put in the trash or sent to landfills and incinerators in Wisconsin.

This report provides an update to the Legislature and governor on the law's implementation and achievements since 2012. Based on data and stakeholder input the DNR has collected throughout its implementation of 2009 Wisconsin Act 50, there is good news to report on progress toward meeting the law's goals. Overall, E-Cycle Wisconsin represents a significant environmental and economic success story for the state and its residents. The DNR recommends policymakers consider a few small changes to further improve E-Cycle Wisconsin and address changes in the electronics recycling industry.

Successes

- Between January 2010 and June 2013, Wisconsin households and schools recycled 123 million pounds of electronics through E-Cycle Wisconsin. During program year 4 (July 2012 to June 2013), registered collectors took in 38.8 million pounds of electronics, or 6.8 pounds per Wisconsin resident—one of the highest rates in the country.
- During program year 4, nearly all manufacturers met or exceeded their recycling targets, with only a handful of companies with small recycling targets choosing to pay a shortfall fee to the state instead of purchasing recycled pounds.
- The number of registered collection sites available to Wisconsin residents has continued to grow. During program year 4, there were nearly 700 permanent or special event collection sites in 67

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Other program results

The E-Cycle Wisconsin 2012 report and more detailed results on the surveys discussed in this report are available at <http://dnr.wi.gov/topic/Ecycle/wisconsin.html#tabx2>.

of Wisconsin's 72 counties, covering 99 percent of the state's population. Since the law took effect, only one county has not had a collection site registered under the program at some point. Consumers in most parts of the state have free or low-cost recycling options for most electronics.

- The vast majority of manufacturers, recyclers and collectors are complying with the law, and the DNR has taken actions to ensure a level playing field for program participants.
- More than 90 percent of the electronics collected under E-Cycle Wisconsin are processed initially in Wisconsin or other Midwest states, contributing to continued growth in the region's electronics recycling industry.

Challenges

- Some Wisconsin residents are still putting electronics in the trash or illegally disposing of them on public and private property. Residents in a few parts of the state still lack good electronics recycling options, or may be unwilling to pay the fees charged by existing collectors.
- The DNR's 2013 household survey showed that awareness of the electronics disposal ban and E-Cycle Wisconsin has dropped since 2011, and residents' biggest barrier to recycling electronics is not knowing where or how to do so.
- The continued rising cost of recycling led glass from cathode ray tubes and diversion of the more valuable electronic components from the program are posing economic challenges to recyclers and manufacturers. At the same time, electronics collection has been exceeding manufacturer targets by several million pounds—a positive outcome in terms of recycling, but one that puts downward pressure on the payments recyclers receive per pound they process.
- A 2013 DNR surveyed showed that many local governments that are collecting electronics are doing so outside of the E-Cycle Wisconsin program, and thus have not been realizing the cost savings envisioned by the law's sponsors.
- Small-scale recyclers and collectors not participating in E-Cycle Wisconsin are, in some cases, mismanaging potentially harmful materials.

Policy recommendations

As part of this annual report, the statute directs DNR to examine several aspects of the electronics recycling law and make recommendations for possible changes. Potential changes that would require legislative action are outlined here for the Legislature's consideration. For a complete discussion of these and other issues, see the policy recommendations section at the end of this report.

- To enhance collection in underserved areas, consider setting up a simple grant program, using manufacturer shortfall fees and some portion of registration fees, to help fund electronics collection sites or events for areas or populations currently underserved by E-Cycle Wisconsin.
- Consider changing the registration fee levels in s. 287.17(4)(b) to assist small businesses by reducing or eliminating registration fees paid to the state by very small electronics manufacturers.
- Consider modifying the definition of "school" under s. 287.17(1)(np) to allow all K-12 schools in Wisconsin to recycle electronics through E-Cycle Wisconsin.
- To gain a firmer understanding of how the mix of products being recycled under E-Cycle Wisconsin compares to the mix of products being sold, consider making small changes to the manufacturer and recycler registration and reporting requirements to require manufacturers to break their sales data into TVs and IT equipment, and have both groups report the pounds recycled by TVs, computer monitors, computers, printers and other eligible electronic devices

Introduction

Wisconsin's electronics recycling law (s. 287.17, Wis. Stats.) establishes a statewide program to collect and recycle certain electronics. Under this product stewardship-based law, manufacturers of TVs, computers and desktop printers must register with the DNR the brands they sell to households and schools in Wisconsin, and recycle a target weight of electronics each year based on their sales. Manufacturers contract with state-registered recyclers and collectors to meet their targets. This manufacturer-funded recycling program is called E-Cycle Wisconsin. The DNR's E-Cycle Wisconsin 2012 Report provides details on the law's history and first three years of implementation.

This 2013 report fulfills the annual reporting obligation in s. 287.17(10), Wis. Stats., which specifies several metrics on which the DNR must report to the Legislature and governor each year. These include the weight of electronics collected under the program and other basic information provided by program participants, an outline of electronics recycling outside of E-Cycle Wisconsin, a summary of compliance and enforcement actions taken related to the disposal bans, and recommendations for any changes needed.

To help evaluate the law and the DNR's administration of it, we also examine whether the law is meeting these six general criteria:

- Keeping electronics out of landfills and the environment.
- Using a market-based approach to manage e-waste in the most efficient and cost-effective manner possible, with minimal government intervention.
- Reducing electronics recycling costs and improving recycling convenience for consumers.
- Reducing the financial and administrative burden on local and state governments of managing e-waste.
- Ensuring a level playing field for all participants in the electronics recycling program, including accountability for environmental, worker safety and other standards.
- Encouraging and supporting a strong electronics recycling industry in Wisconsin and the Midwest.

The results presented below suggest the E-Cycle Wisconsin program, coupled with the disposal ban, is largely satisfying these criteria, but challenges remain. The DNR can address some of these challenges through its administration, compliance and outreach efforts, but some may require legislative changes. Stakeholders and DNR staff have identified certain aspects of the program that could be improved, as well as a few key issues that will bear watching over the next few years. These potential improvements and issues are discussed at the end of this report.

Electronics in Wisconsin

The number of electronics in Wisconsin households continues to grow. The number of TVs increased by nearly 1 million between 2010 and 2013, the number of computers went up by 1.5 million and the number of cell phones increased by more than 2.5 million. In 2013, the average household had three or more TVs, about two computers, and three or more cell phones.

While the number of these devices increases, device lifespans continue to decrease, leading to more electronics stored in homes. In 2013, there were approximately 8.2 million TVs in Wisconsin households (21 percent unused), 5.9 million computers (31 percent unused) and 7.8 million cell phones (44 percent unused).

Based on 2010 and 2013 DNR surveys of Wisconsin households.

E-Cycle Wisconsin program years

Program years run from July 1 to June 30. The first program "year" lasted just six months, to get the program on this calendar. Here are the dates for program years referenced in this report.

Program year 1
January 1 to June 30, 2010

Program year 2
July 1, 2010, to June 30, 2011

Program year 3
July 1, 2011, to June 30, 2012

Program year 4
July 1, 2012, to June 30, 2013

Program year 5
July 1, 2013, to June 30, 2014

Table 1: Program year 4 registration and participation

Category	Registered	Active
Collectors	153	132 (86%)
Recyclers	31	20 (65%)
Manufacturers	104	n/a
Brands	163	n/a

Program participation

E-Cycle Wisconsin collector and recycler registrations in program year 4 were very similar to program year 3, though the number of recyclers that actively participated in the program declined slightly. (“Active” means a collector that sent electronics to a registered recycler or a recycler that received electronics from registered collectors.) The number of registered manufacturers and brands increased substantially due to increased DNR efforts to gain compliance from manufacturers and retailers.

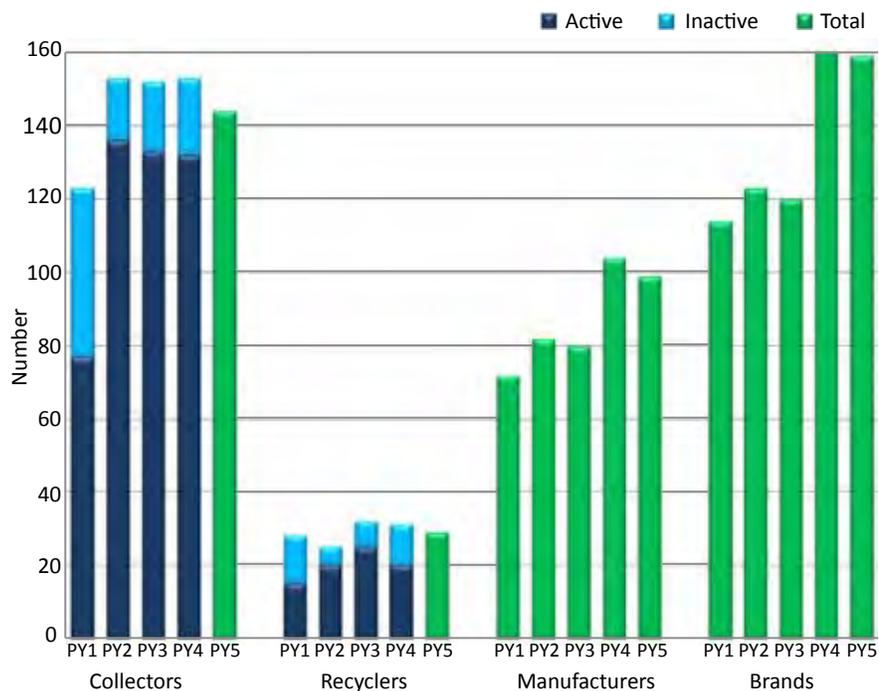
Table 1 shows registrations for program year 4, and Figure 1 illustrates registration trends over the first five program years (with program year 5 numbers as of October 2013).

Registered collectors fall into four main categories: local governments, electronics retailers, other for-profit businesses and non-profits. The mix of collectors remained relatively unchanged from program year 3 to program year 4. Figure 2 shows the number of each type of collector registered over the first four program years.

During program year 4, there were 478 permanent and 203 temporary or event collection sites registered with E-Cycle Wisconsin for at least part of the year, a total of 681. For-profit collectors operated the highest number of sites (385, or just over half the total), though many of these were at retail or government locations, as seen in Figure 3.

There were also a handful of for-profit sites located at non-profits, such as Habitat for Humanity Re-Store locations listed under a for-profit collector’s registration.

Figure 1: Summary of registration and participation



PY = program year. Program year 5 totals as of October 2013.

Collection and recycling totals and analysis

Collection of eligible electronics under E-Cycle Wisconsin during program year 4 declined slightly from program year 3. From July 2012 through June 2013 (program year 4), registered collectors took in 38.8 million pounds of electronics from Wisconsin households and schools (see Table 2). This was equivalent to 6.77 pounds per capita. Figure 4

shows collection totals for the first four program years, a cumulative total of 123 million pounds collected since January 2010.

Despite the slight drop in pounds collected, Wisconsin still has one of the highest per capita collection totals among the 25 states with e-waste laws. Wisconsin, Minnesota, Washington, Oregon and Vermont are all collecting more than six pounds of electronics per person. In comparison, five states with e-waste laws collect less than one pound per person.

Collection increased from program year 3 to 4 among retailer and government collectors, and declined among non-profit and for-profit collectors, as shown in Table 3 and Figure 5. The biggest growth was among retailers, which now account for the second-largest share of pounds collected, after for-profit collectors. A small number of registered retailer and non-profit collectors accounted for a large portion of the total in all four program years. Some of the largest collectors include the various Goodwill store groups across the state, Best Buy stores and American TV and Appliance stores.

The law does not require collectors to provide a breakdown of what they collect by product type (TV, computer, etc.). However, about a quarter of reporting collectors provided this breakdown, giving a rough picture of the types of electronics being collected under E-Cycle Wisconsin (see Table 4). TVs and computer monitors made up about three-quarters of what was collected overall, by weight. This is nearly identical to the product breakdown in program year 3 (see Figure 6), and is an indication of the large role cathode ray tube glass from older TVs and monitors

Figure 2: Collector registration by type and program year

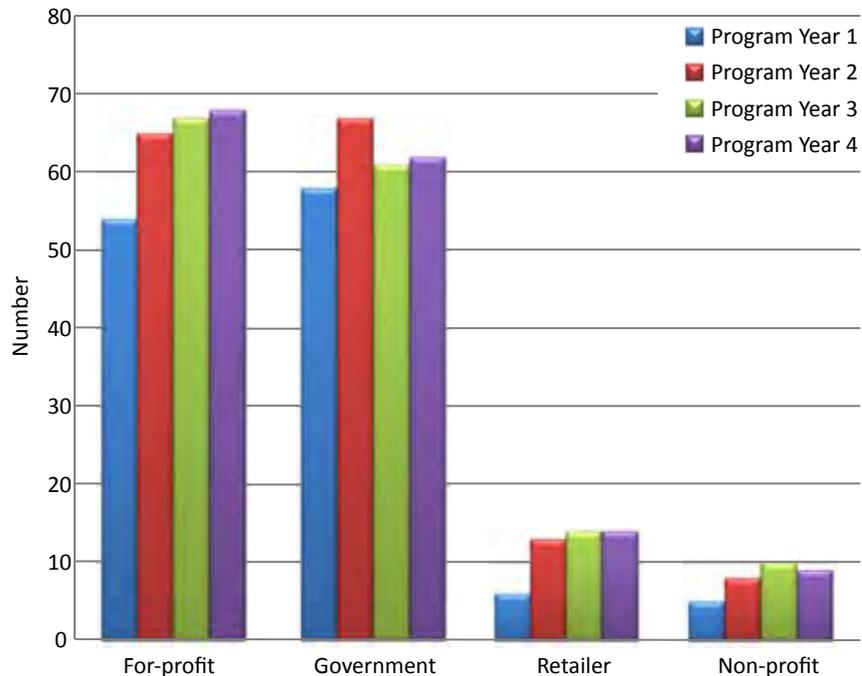


Figure 3: Program year 4 collection sites, by type

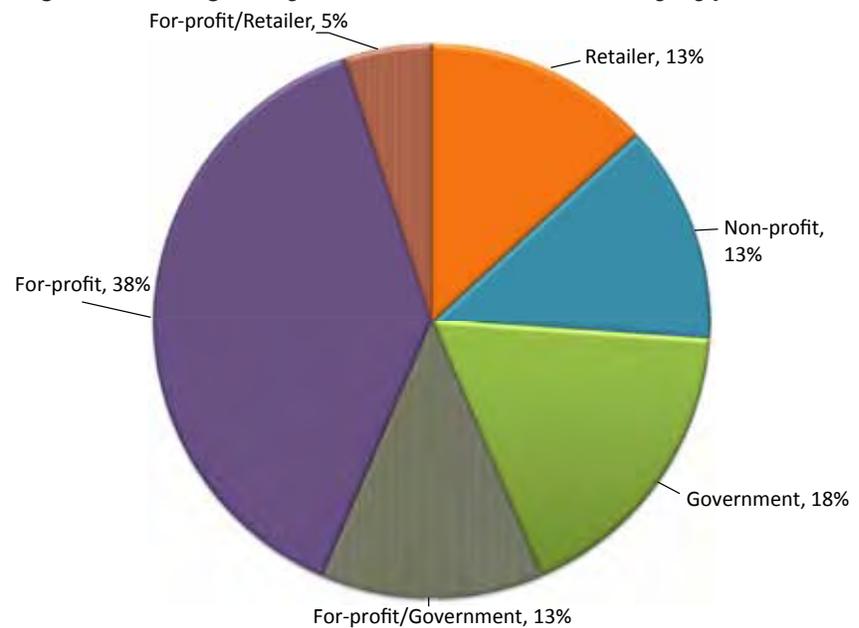


Table 2: Eligible electronics collected by registered collectors, program year 4

Type	Pounds
Urban	33,849,764
Rural	4,271,155
Not sent to registered recyclers	634,832
Total collected	38,755,751

Figure 4: Pounds collected by registered collectors

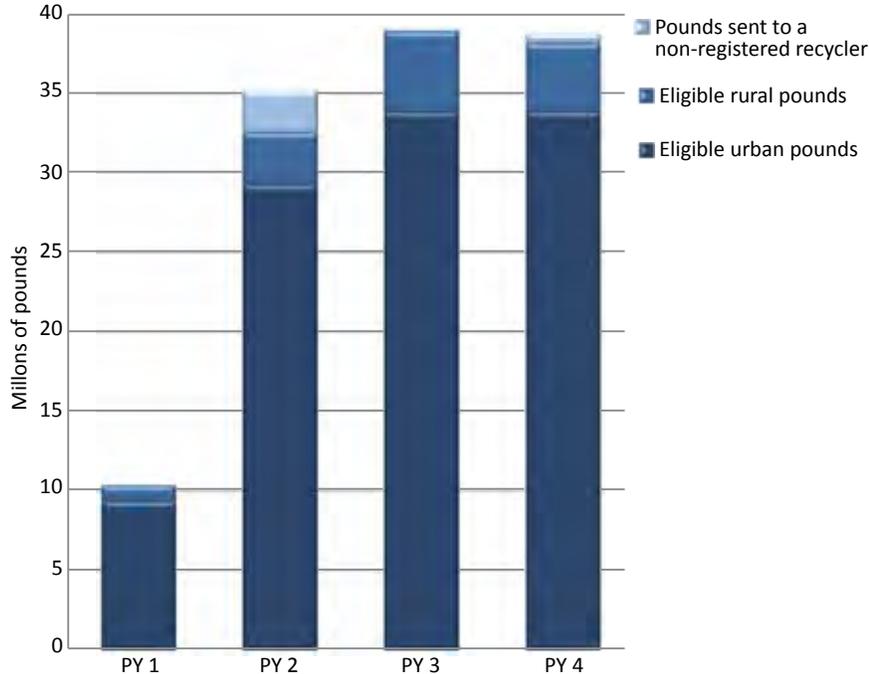


Table 3: Pounds collected, by collector type

Type	PY3	PY4
Retailer	6,534,563	8,052,553
Non-profit	7,883,078	7,603,039
Gov't	7,045,440	7,478,395
For-profit	17,635,236	15,621,765
Total	39,098,317	38,755,751

PY = program year

Table 4: Program year 4 collection, by product type

Product type	% of total weight
TVs	64%
Monitors	10%
Computers	7%
Other EEDs	20%

EEDs are eligible electronic devices. Other EEDs include printers, computer accessories, DVD players, VCRs and fax machines.

continues to play in the recycling program.

Collection exceeded the overall manufacturer recycling target for program year 4 of approximately 32 million pounds. With the rural credit factored in and pounds diverted for reuse subtracted out, Table 5 shows that registered recyclers had 39.1 million eligible pounds available for purchase and sold 33.9 million pounds to manufacturers—totals nearly identical to program year 3.

Twenty-nine manufacturers recycled more than their target weights during program year 4

and earned credits for use in future years (though in some cases, the amounts were negligible—a few pounds or less). In total, manufacturers earned just under 2.3 million credits during program year 4. Thirteen manufacturers used credits they had either earned in a previous year or purchased from another manufacturer to meet their program year 4 targets. At the end of program year 4, just over 4.6 million pounds of credits were available to manufacturers for future use.

Manufacturer recycling programs

During program year 4, just over one-quarter of registered manufacturers (28) participated in a manufacturers' collective that contracts with recyclers for a large total sum of pounds and distributes the recycled pounds among its members. The largest active collective is MRM (17 manufacturers), with a smaller number of manufacturers participating with E-World Online (8) and Reverse Logistics Group (3). These collectives were responsible for just over one-third of the recycled pounds purchased by manufacturers during program year 4.

Based on responses to DNR's 2012 manufacturer survey and continued discussions with stakeholders, it appears that most manufacturers rely on the recyclers they contract with to find and/or set up collection networks. Prominent exceptions include the Dell Reconnect program, in which Dell works with several networks of Goodwill stores to collect eligible electronics; Best Buy's in-store collection program (Best Buy is also a manufacturer); a partnership between Hewlett Packard (HP) and collection points at the Staples retail chain; and Apple's recycling program for schools.

Recycling access and costs for consumers

The number of collection sites registered with E-Cycle Wisconsin has steadily increased, with nearly 700 sites registered during program year 4 (see Figure 7).

As of October 2013, there were approximately 450 permanent collection sites and several temporary/special event collection sites registered with E-Cycle Wisconsin for program year 5. During program year 4, there were E-Cycle Wisconsin collection opportunities in 67 of Wisconsin’s 72 counties, covering 99 percent of the state’s population (see map in Appendix A). Since program year 5 began in July 2013, there have been collection events in two new counties, Iron and Marquette, meaning all counties except Florence have had at least one permanent collection site or collection event since the program began in 2010.

Wisconsin has the highest number of collection sites per 100,000 people among states with electronics recycling laws, according to research by the National Center for Electronics Recycling. Some residents in rural areas, however, continue to have very limited access to collection locations—especially permanent drop-off sites. The DNR would like to find new ways of encouraging collection in these areas. See a discussion on this topic in the policy recommendations section.

Fees charged by registered collectors

The proportion of active collectors charging fees to consumers in-

Figure 5: Collected pounds over time, by collector type

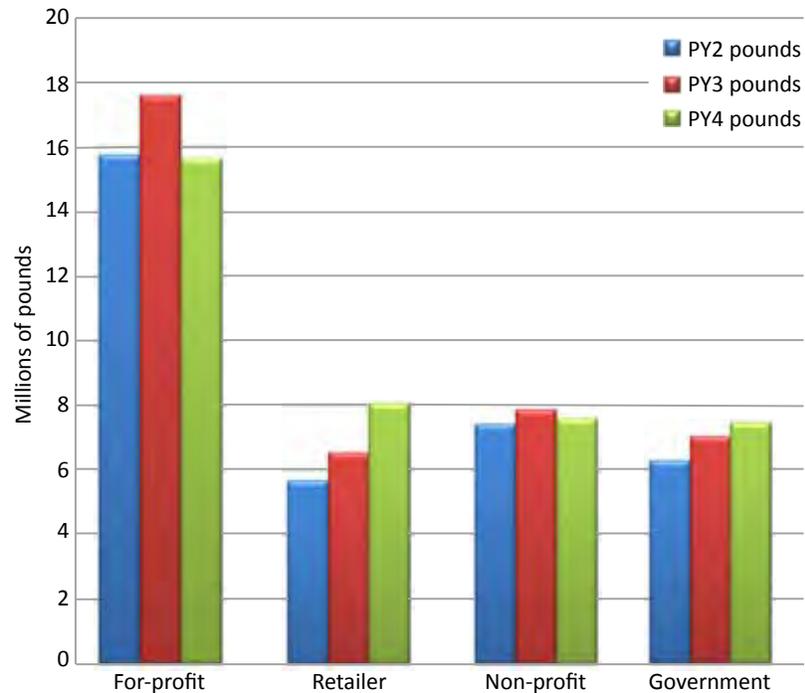


Figure 6: E-Cycle Wisconsin collection by product type

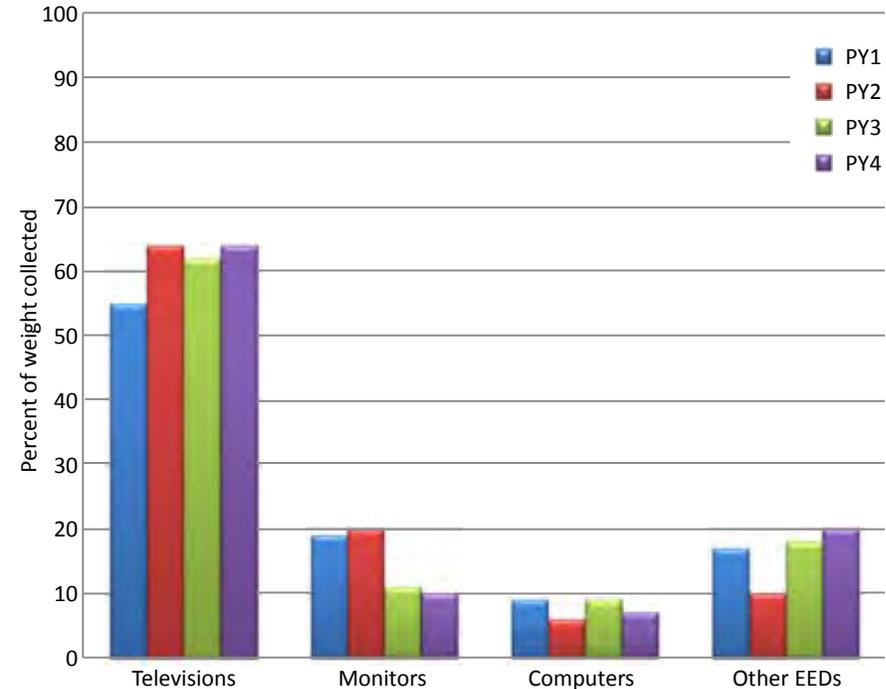


Table 5: Eligible pounds received and recycled, program year 4

Type	Pounds
Urban	34,022,002
Rural with credit	5,174,305
Diverted for reuse	6,346
Counted for manufacturer targets	33,854,203

Rural credit is 1.25 pounds per pound collected. For a map of which counties are designated urban and rural, see <http://dnr.wi.gov/topic/Ecycle/documents/countiesmap.pdf>.

Urban and rural pounds differ slightly from Table 2 because of how collectors and recyclers report pounds collected before a program year end but not received by a recycler until the next year. The last row shows pounds manufacturers purchased from registered recyclers.

creased slightly from program year 3 to program year 4, though 70 percent still offer at least some free collection opportunities.

During program year 4, 63 percent of active collectors reported charging some type of fee for some items. The majority of fees were assessed per item (e.g., \$15 to recycle a TV), but some collectors charged per-pound fees or used other fee systems (see Figure 8). TVs and computer monitors, especially larger or older, CRT-style models, were the items most likely to be assessed a fee. Some of the charges in the “other” category included charges for home pick-up or a small, flat fee per visit to a drop-off center. Of the 82 collectors that charged a fee, about half accepted some items for free. About one-third of active collectors did not charge any type of fee for electronics recycling.

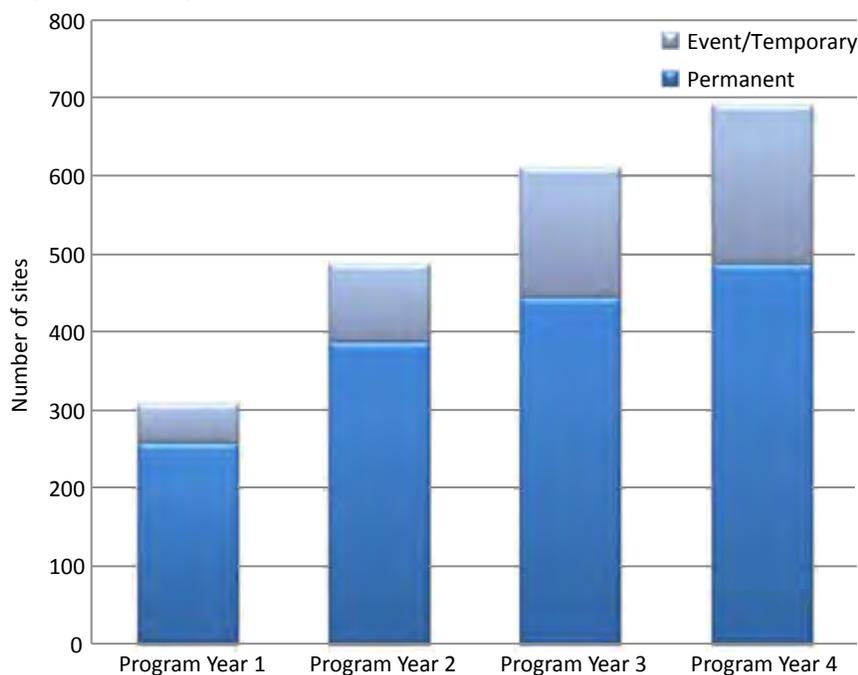
Fee levels in program year 4 were similar to previous program years. Most collectors charging for TVs differentiated by size, with smaller TVs typically costing \$10 to \$15 and larger ones costing \$20 to \$30. A few charged \$40 or more for very large, console or projection TVs. Most monitor charges were in the \$5 to \$10 range. Collectors that charged for computers typically charged \$5 to \$10 (see Figure 9). Per pound fees ranged from 12 to 40 cents, with the most common amounts in the 15- to 25-cent range.

Barriers to recycling electronics

In 2013, the DNR conducted a statewide household survey to gather current information on Wisconsin residents’ opinions, behaviors and knowledge of electronics recycling. The results from this survey can be compared to surveys asking similar questions in 2006, 2010 and 2011.

The primary barriers to electronics recycling in Wisconsin have been shifting over time. While previous surveys have shown that inconvenient collection sites (2010) and expense (2011) were the primary barriers to electronics recycling, the 2013 survey showed that nearly 60 percent of respondents didn’t know where or how to recycle their electronics (see Figure 10). This result is backed up by another 2013 survey question that showed only 28 percent of respondents were certain about where to take electron-

Figure 7: Registered collection sites over time



ics for recycling. As discussed in detail later in this report, the 2013 survey also showed a drop in awareness about the E-Cycle Wisconsin program.

Since the E-Cycle Wisconsin website makes finding electronics collection sites easy, this primary barrier to e-cycling could be addressed by increasing general public outreach. The DNR plans additional public education efforts, including a spring 2014 move into TV advertising, to make the E-Cycle Wisconsin website the first place people visit when unsure about how to dispose of old electronics.

Compliance and enforcement within E-Cycle Wisconsin

Manufacturer compliance

Manufacturer compliance is an important foundation of E-Cycle Wisconsin. It is a manufacturer's responsibility to register all brands of covered electronics sold to households and K-12 schools in Wisconsin. Manufacturers pay a graduated annual registration fee depending on the number of units they sell in Wisconsin during a 12-month period (the fee is waived for manufacturers that sell fewer than 25 units).

Manufacturers of all major electronics brands have complied with the law. As has been the case in other states with electronics

Figure 8: Fees charged by registered collectors, by year and fee type

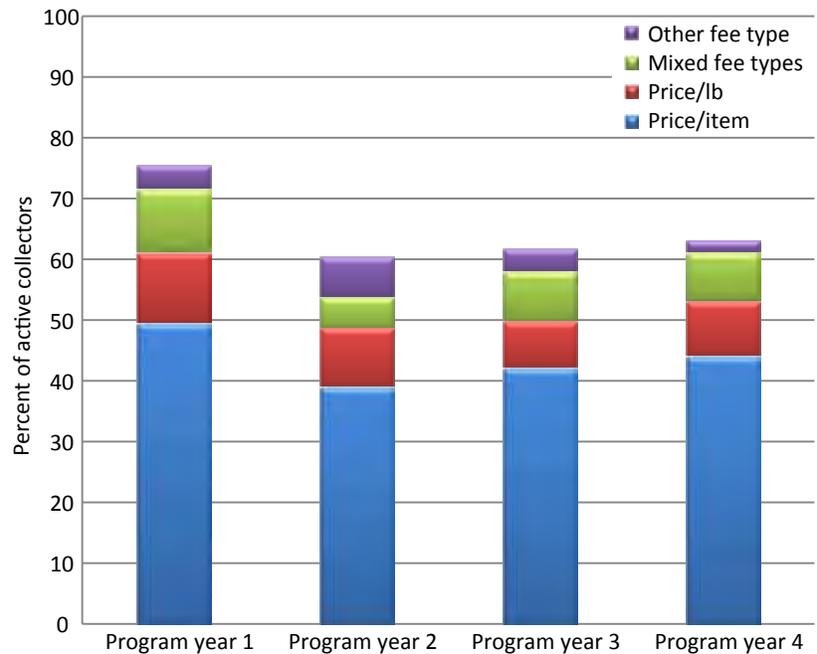


Figure 9: Price range and average prices charged for EEDs by collectors who charged fees per item

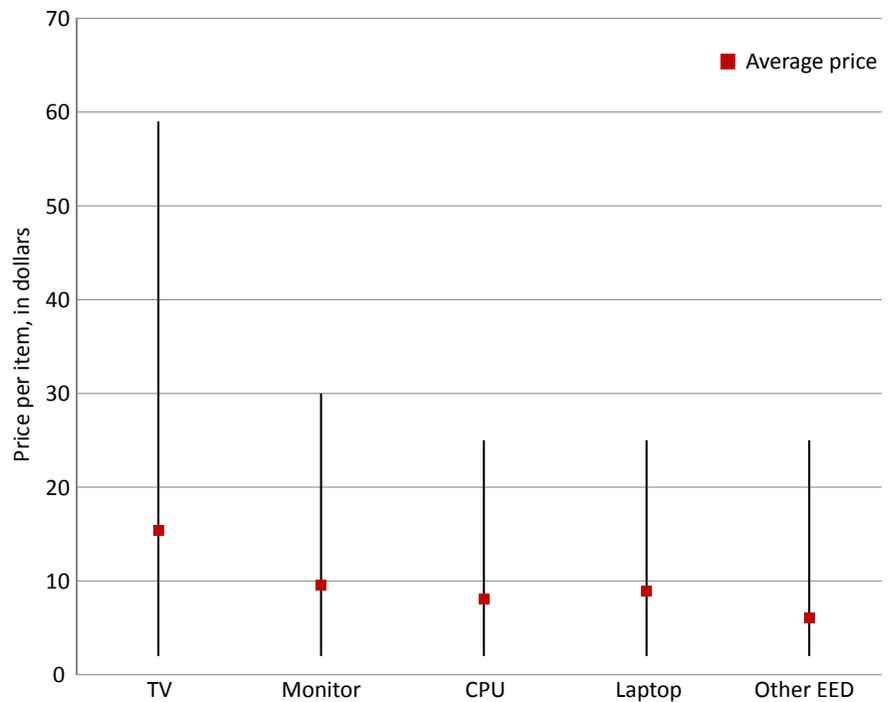
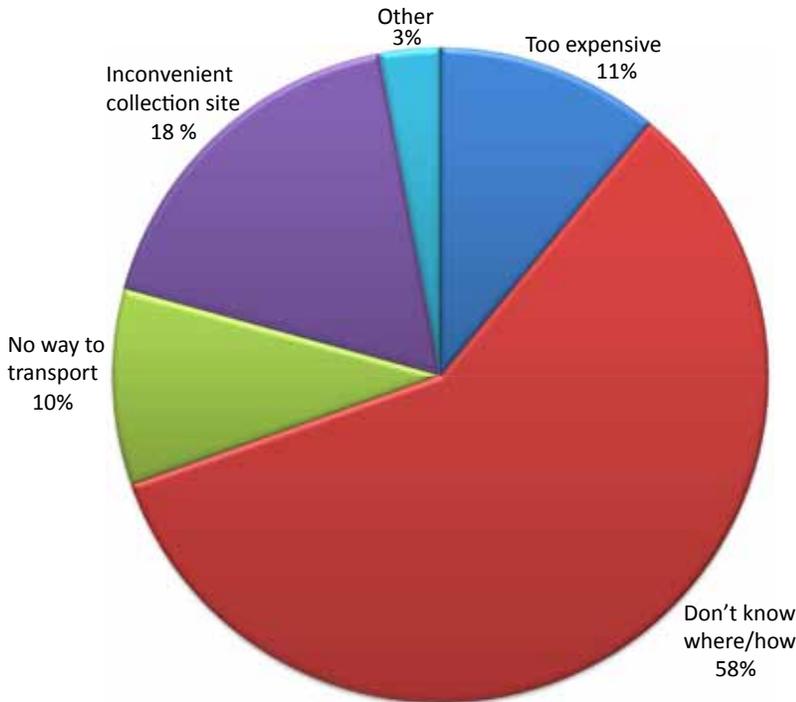


Figure 10: Reported barriers to recycling electronics



take-back laws, however, getting many smaller manufacturers that may sell only one or two types of electronics in the state to register has been a challenge. To level the playing field for all manufacturers, the DNR increased efforts to register more manufacturers during program year 4.

In previous years, the DNR used lists from other states and occasional Internet searches to find unregistered brands and maintained a “do not sell” list on its website. In program year 4, at the suggestion of another state with similar requirements, the DNR conducted extensive Internet searches for unregistered brands and then contacted retailers

selling the unregistered brands to let them know the unregistered device could not be sold to Wisconsin households and schools.

This retailer-based approach to compliance was far more successful than the previous process. During the DNR’s push to register brands in winter 2012-13, we contacted 15 retailers regarding approximately 90 brands. Within two months of this contact, more than one-third of these brands were registered or had been removed from the unregistered list because the product was not for home use or the brand was accidentally left off a previously registered manufacturer’s brand list. Manufacturers of 26 brands let us know they were registering because they had been contacted by a retailer that could no longer sell their products. Due to this success, the DNR intends to continue to contact retailers about unregistered brands.

As in previous years, several brands were removed from the unregistered brand list because it appeared that the brand was no longer being sold. The DNR works with other states and the Electronics Recycling Coordination Clearinghouse to keep the unregistered brand list as accurate and up-to-date as possible and to share manufacturer contact and compliance information. It is our hope to improve the efficiency of this process and possibly work with other states to develop Web-based tools to improve retailer and manufacturer compliance.

Another challenge for the DNR remains getting all manufacturers to register and pay applicable registration fees on time. In 2013, 10

manufacturers had failed to submit required re-registration materials and/or payment by the beginning of November.

In addition to registration, the law requires manufacturers to meet weight-based recycling targets. Manufacturers can choose to pay shortfall fees to the state to meet part of or their entire recycling obligation. Each year, the DNR has worked with manufacturers to help them purchase eligible recycled pounds rather than pay a fee, but several have said it is more convenient for them to pay the fee than to go through the process of contracting with a recycler. During program year 4, 15 manufacturers paid a fee, and 12 of those paid the fee for their entire obligations. The amounts ranged from \$0.47 to \$4,275.50.

Table 6 summarizes the registration and shortfall fees paid during the first five E-Cycle Wisconsin program years.

Retailer compliance

Retailers also play a vital role in E-Cycle Wisconsin. Electronics retailers have a responsibility to only sell brands that have been registered in the state and to educate their customers about the electronics disposal ban and electronics recycling opportunities. The DNR has reached out to covered retailers through Wisconsin retailer associations and has a retailer-specific Web page and publications to inform retailers of their obligations under the law. Throughout program years 4 and 5, the DNR has stepped up retailer compliance efforts.

In fall 2012, DNR E-Cycle Wisconsin staff sent a detailed Retailer Toolkit to all brick-and-mortar electronics retailers in the state. The toolkit informed the retailers of their obligations. With the exception of large chain stores, these establishments received a hard copy of the toolkit, an employee handout and copies of educational materials they could use to fulfill their educational requirement. The headquarters of chain stores received emailed copies of the materials.

In 2013, we began regular on-the-ground inspections of electronics retail stores. As of Aug. 1, we had visited 50 stores in the state. Nearly 70 percent of these were national “big box” chains, 10 percent were regional chains and just over 20 percent were small, local electronics retailers. Of the 47 stores we inspected for brand compliance, we found unregistered brands at 10 of them. Of the 50 stores we inspected for educational materials, we found educational materials in five of them. These five locations were the only stores to be in full compliance with the legal requirements for electronics retailers. Three of these were local stores and two were Wal-Mart stores.

To see if there was at least an awareness of the electronics recycling law among employees at electronics retailers (a helpful tool in educat-

Table 6: Manufacturer registration and shortfall fees

Program year	Registration fees	Shortfall fees
1	\$261,250	n/a
2	\$270,000	\$8,453
3	\$275,000	\$19,210
4	\$310,000	\$10,105
5	\$296,250	--

Figure for program year 5 as of November 2013. The law did not assess shortfall fees for program year 1.

Registration lists

The DNR keeps updated lists of registered and unregistered manufacturers and brands, registered recyclers and collectors, and registered collection sites on its website. Lists are available at <http://dnr.wi.gov/topic/ecycle/wisconsin.html>.

ing customers, but not a requirement of the law), we asked employees at 35 stores what to do with an old, broken TV. Only five employees were able to give exemplary answers—mentioning that electronics may not be put in the trash, saying that electronics must be recycled and providing accurate information on how to recycle electronics. Just over half of the people we asked gave helpful, accurate information (including the five exemplary answers). The other 17 employees either gave inaccurate information, no information or basic guidance (such as, “I think it can be recycled, try looking it up online.”).

During program year 5, the DNR plans to follow up more formally with retailers to enforce the law’s retailer requirements.

Inspections of recyclers and collectors

Recyclers registered with E-Cycle Wisconsin must meet standards beyond those required of recyclers that operate outside of the program. These higher standards include maintaining owner financial responsibility (OFR) to cover proper closure of the facility, pollution liability insurance of at least \$1 million and a written contingency plan to manage emergencies. Registered recyclers are also required to maintain adequate records showing the weights of eligible electronic devices collected and processed and the downstream vendors that receive the materials.

To ensure that registered recyclers are complying with these requirements, as well as other solid and hazardous waste management regulations, in-state registered recyclers are subject to routine DNR inspections, conducted at a minimum frequency of once every other year. Out-of-state recyclers have not yet been physically inspected, but must provide proof of OFR, liability insurance and paperwork verifying that the electronics collected under E-Cycle Wisconsin are managed in an environmentally sound manner. For more details on recycler inspections, see the E-Cycle Wisconsin 2012 Report.

Collectors registered with E-Cycle Wisconsin must also meet minimum standards, including recordkeeping and reporting to the DNR, and are subject to DNR inspections. Initial inspection of many collection sites took place over the summer and fall of 2013. These inspections served as an opportunity to provide site operators with technical assistance and customer education materials. At sites that were engaged in electronics dismantling, E-Cycle Wisconsin staff provided guidance and information to help avoid electronics mismanagement, such as stockpiling and landfilling components that are difficult to recycle on a small scale.

The increased collection site inspections will continue until most sites have been visited. At that point, the DNR will determine where to

focus future inspection efforts, how often to inspect and needs for additional outreach materials to aid collectors in complying with program requirements. Inspectors have already heard from site operators that more instruction on best management practices would be helpful. As a result, the DNR is creating a collector best management practices video that will walk collectors through the storage and management issues surrounding e-waste.

Table 7: DNR inspections conducted, by program year

Time period	Recyclers	Collection sites
Jan. 1 to June 30, 2010	4	5
July 1, 2010, to June 30, 2011	8	20
July 1, 2011, to June 30, 2012	8	29
July 1, 2012, to June 30, 2013	10	65
July 1 to Nov. 1, 2013	2	89

Table 7 lists the number of inspections the DNR has conducted each program year.

Collector and recycler compliance

Since E-Cycle Wisconsin began, several recyclers and collectors have been removed from the program. In all cases, the DNR gave collectors and recyclers extra time to submit paperwork (several weeks or more) and offered technical assistance to help them comply.

The most common reason recyclers have been removed is for failure to maintain adequate OFR. The other reasons for removal of recyclers and collectors include failure to submit registration forms or meet reporting requirements. Many recyclers and collectors have voluntarily left the program because it did not fit with their business plans or other activities. Through November 2013, no registered collectors or recyclers had been removed from the program because of environmental violations.

During program year 5, as of November 2013, five collectors had failed to submit complete re-registration and report forms and were suspended from the program. A sixth was briefly suspended but subsequently submitted its completed form and was reinstated. One recycler failed to submit its registration and report form and was removed from the program.

Electronics recycling separate from E-Cycle Wisconsin

Other than the bans on landfilling or incinerating several types of consumer electronics, the 2009 electronics recycling law did not change the electronics recycling regulatory landscape outside of the manufacturer-funded E-Cycle Wisconsin program. This landscape includes all electronics recycled from businesses, government offices, institutions and others not eligible for E-Cycle Wisconsin. It

Electronics recyclers listed in the Wisconsin Recycling Markets Directory

The Wisconsin Recycling Markets Directory (<http://wisconsinrecyclingdirectory.com>) is operated by the UW-Extension Solid and Hazardous Waste Education Center, with some funding support from the DNR. Businesses, local governments and others that collect or recycle a wide variety of materials may list themselves in the directory. One category included in the directory is electronics, and as of November 2013, there were 111 locations listed under that category—a mix of collectors and recyclers. Only 42 of the locations listed were registered with E-Cycle Wisconsin.

also includes electronics from households and schools that are not processed by registered E-Cycle Wisconsin collectors and recyclers.

Inquiries from aspiring recyclers

Since before E-Cycle Wisconsin began, electronics recycling has appealed to some as a business opportunity, based on increased demand for recycling and the misinformed idea that recycling electronics is simple. DNR staff working on E-Cycle Wisconsin receive one or two inquiries a month, on average, from individuals or businesses interested in collecting and/or recycling electronics. During the state's 2013 fiscal year, which corresponds with E-Cycle Wisconsin's program year 4, staff handled approximately 15 formal inquiries (where the DNR provided written information in response to a request) and several less formal inquiries about electronics recycling requirements and whether E-Cycle Wisconsin registration was appropriate.

Recyclers that register with E-Cycle Wisconsin should be working on behalf of a manufacturer or intending to sell pounds to other registered recyclers that are working with manufacturers. Therefore, the majority of inquiries have not resulted in recyclers that register with E-Cycle Wisconsin.

Currently, collectors and recyclers that perform basic disassembly and dismantling of electronics are treated as exempt from most solid and hazardous waste requirements, as long as the materials are being handled appropriately. Consequently, only recyclers participating in E-Cycle Wisconsin are operating under DNR regulatory oversight. Monitoring recycling activities that occur outside of E-Cycle Wisconsin has been extremely challenging; often these activities only come to the DNR's attention when a problem occurs.

For instance, DNR staff are occasionally contacted by people who started a recycling business without understanding the complexities of marketing the individual components. Unfortunately these calls usually come after the individual has accumulated a number of cathode ray tubes (CRTs) and he/she is surprised to learn that there is a high cost involved in managing them appropriately. Staff have worked with these individuals to find appropriate recycling locations. To help reduce these problems, DNR staff cautions anyone inquiring about starting an e-cycling business that they should have markets established for the components beforehand.

Not everyone contacts the DNR about starting an electronics collection or recycling business before beginning to dismantle used electronics. The DNR continues to receive calls every year about CRT dumps in rural or abandoned locations. A longer description of these activities is in the "Improper recycling" section below.

Local government collection outside of the program

One of the intentions behind the electronics recycling law was to reduce the burden of collecting electronics on local governments. In May 2013, the DNR conducted a survey of local governments to see if the law is reducing collection burdens.

The survey found that it is possible that E-Cycle Wisconsin is reducing the collection burden on some governments, but many do not seem to be taking advantage of the manufacturer take-back program. A handful of governments that were collecting electronics before 2010 were able to stop collecting because others set up collection points nearby. However, nearly 40 percent of the local government collectors that responded to the survey started collecting after the law took effect—showing that governments still see a need for collection despite the increase in other sites under E-Cycle Wisconsin. Most surprisingly, nearly two-thirds of the 153 local governments that said they were collecting electronics were not registered with E-Cycle Wisconsin. It is not clear why these governments have not joined the program, and the DNR has little information about their collection activities.

Disposal ban compliance and enforcement

A primary focus of the DNR’s compliance efforts remains education and outreach to the general public and to various participant groups, to make sure they are aware of the law and its requirements, and to help manufacturers collect enough to meet their recycling targets. The electronics recycling law directs the DNR to conduct this outreach.

While public awareness of the disposal ban and E-Cycle Wisconsin rose dramatically following the implementation of the electronics recycling law, it has since dropped off, according to regular statewide household surveys the DNR has conducted. The DNR’s 2013 survey results showed that, nearly four years after the law went into effect, public awareness has dipped. Awareness of both the disposal ban and E-Cycle Wisconsin has dropped back to 2010 levels

Figure 11: Awareness of electronics disposal ban and E-Cycle Wisconsin

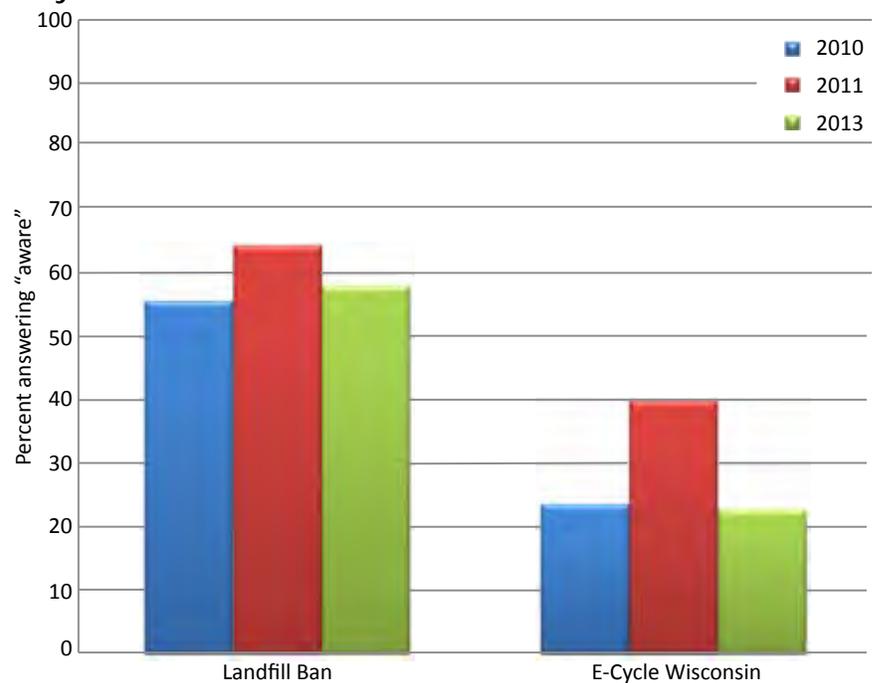
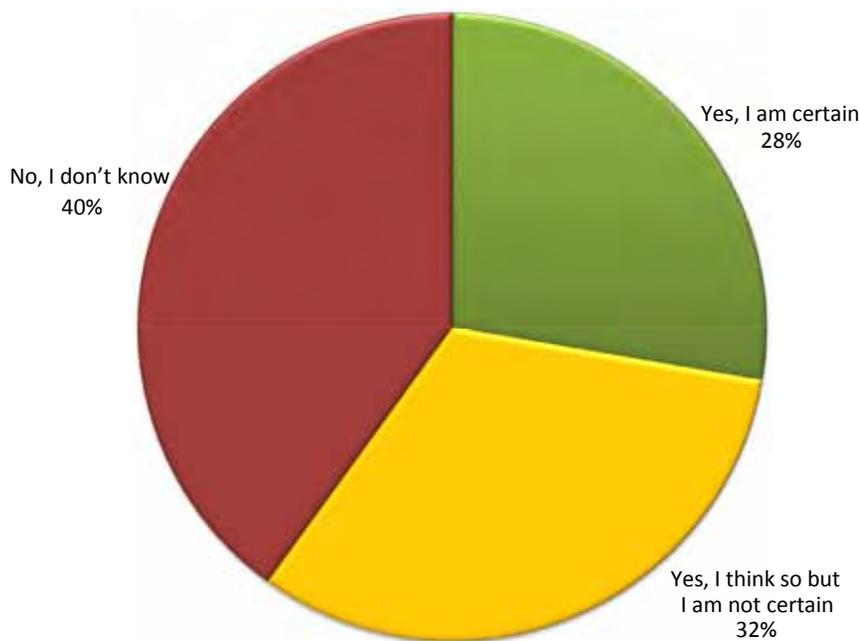


Figure 12: Do Wisconsin residents know where to take electronics for recycling?



after a high point for both in the 2011 household survey (see Figure 11). According to the 2013 results, less than one-quarter of Wisconsin's population is aware of E-Cycle Wisconsin.

When asked more generally if they knew where to take electronics for recycling, 28 percent of survey respondents said they were certain they did, and another 32 percent said they thought so but were not certain (see Figure 12). This indicates that many residents would be able to find electronics recycling locations without knowing specifically about the E-Cycle Wisconsin program, but at least 40 percent of residents wouldn't know where to go.

Because the E-Cycle Wisconsin website helps consumers find electronics collection sites, this lack of awareness is directly tied to the current primary barrier to electronics recycling (see Barriers section above). It is important that the DNR E-Cycle Wisconsin team continue to help consumers find this website. Over the past year, the DNR produced two new posters for a general audience, attended festivals and continued to do statewide radio announcements and press releases. The DNR plans to run TV advertisements statewide in spring 2014 and will soon begin using online advertising tools to reach a broader audience.

Part of the reason much of the general public may be unaware of the electronics recycling law is that some participant groups charged with educating the public about E-Cycle Wisconsin and the disposal ban (namely electronics retailers and local government recycling responsible units) are themselves unaware of the law and their responsibilities under it. In addition to the broad public outreach the DNR has been conducting, several campaigns targeted at specific participant groups are ongoing.

Earlier sections of this report describe efforts to increase retailer compliance with the requirement to educate their customers about the disposal ban and E-Cycle Wisconsin. By teaching people what to do with their old electronics when they are purchasing new ones, the

DNR hopes that greater retailer compliance will lead to an increase in general public awareness and compliance.

The DNR is also planning new targeted outreach to local government recycling responsible units (RUs) to increase their compliance with the law's public education component. The DNR mailed well over 18,000 E-Cycle Wisconsin publications to local governments and others during program year 4, but the people who ordered the publications represent a small subset of local governments in the state. It is clear from the 2013 local government survey that many local governments are not aware of the educational publications and other outreach tools the DNR has to offer. The DNR will send a packet to all RUs in the coming year that will include sample copies of all E-Cycle Wisconsin publications, an ordering form, suggestions on how to use the publications and a video explaining RU requirements under the law.

Trends in consumer management of unwanted electronics

Determining how many pounds of electronics are recycled each year through E-Cycle Wisconsin is much easier than determining how many pounds of electronics are available for recycling but not brought to registered collectors. In its 2013 household survey, the DNR asked respondents to list the total number (each) of TVs, computers and cell phones in their households and the number of these items that was unused. Based on these responses and the responses collected in previous household surveys, the number of electronics in Wisconsin households continues to rise (see Figure 13). In 2013, more than 20 percent of TVs, 30 percent of computers and 40 percent of cell phones were unused.

According to the household survey results, most of these unused items are eventually reused (donated to charities, given to family/friends) or recycled, with a declining number of respondents between 2006 and 2013 saying they put electronics in the trash. The U.S. Environmental Protection Agency estimates that only about 25 percent of unused consumer electronics are recycled nationwide. Wisconsin appears to have higher rates of recycling than this national average (see Figure 14).

Figure 13: Total number of electronics in Wisconsin homes over time

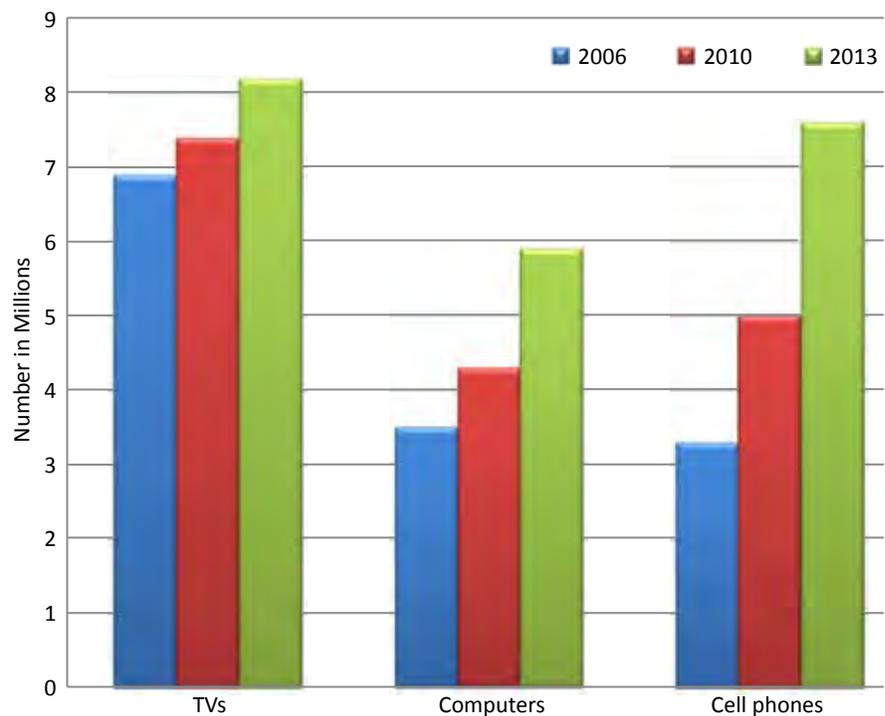


Figure 14: Wisconsin household disposal methods, by product type (2013)

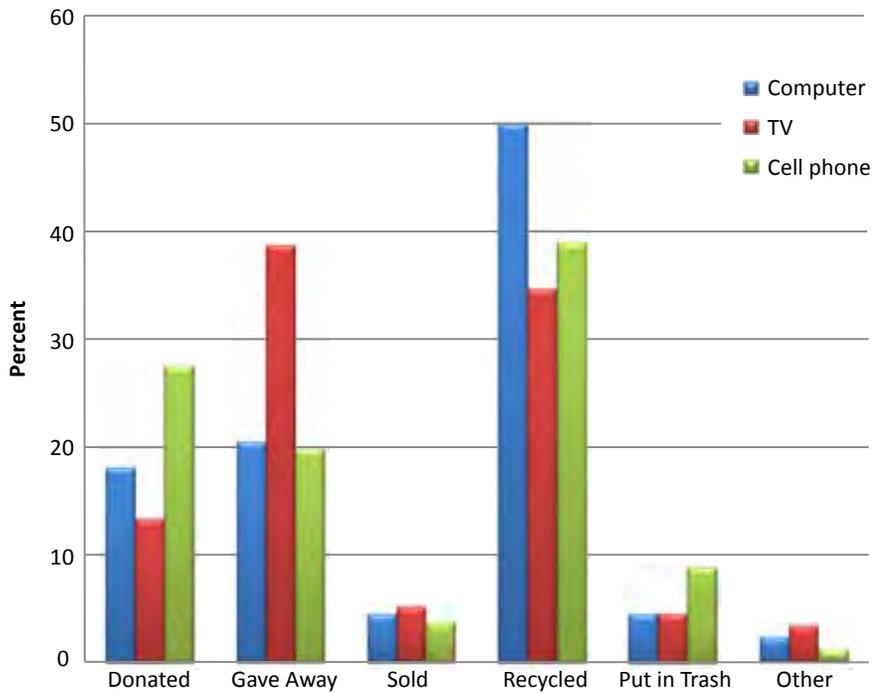
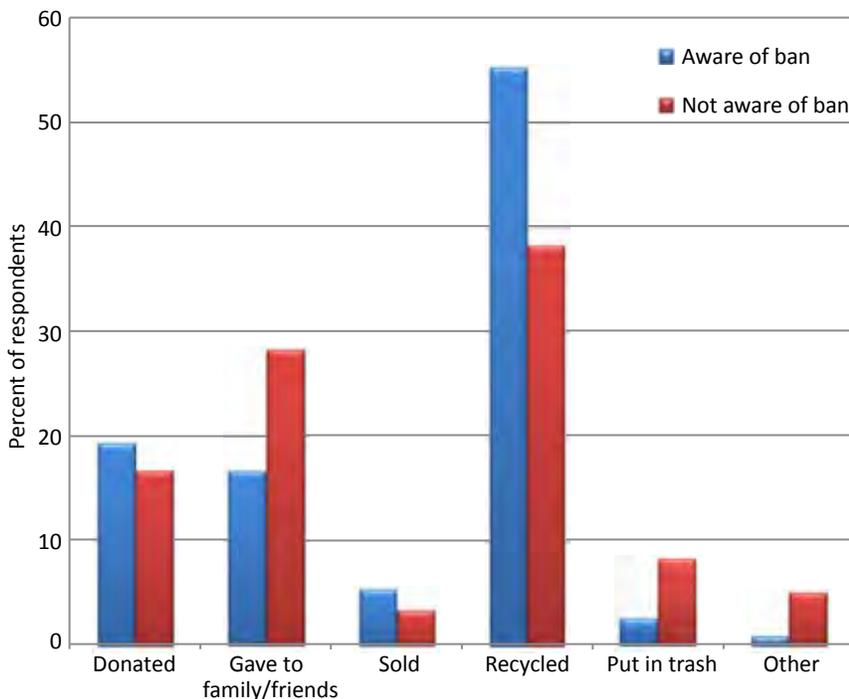


Figure 15: Wisconsin household computer disposal method based on disposal ban awareness



as the plastic casings. DNR solid waste staff have been working with the U.S. Environmental Protection Agency to respond to a complaint about a non-registered recycler possibly mishandling electronics (exporting them or shipping them to illegitimate downstream recyclers).

As in 2011, the 2013 survey indicated that respondents who knew about the disposal ban were more likely to recycle old electronics than those who were not aware of the ban, particularly when it comes to computers (see Figure 15). This makes it even more important that the DNR and participant groups continue to educate the public about the disposal ban and E-Cycle Wisconsin. For TVs and computers, however, the trend toward recycling or reusing devices, instead of putting them in the trash, continued in 2013 despite the lower overall awareness of the disposal ban and E-Cycle Wisconsin.

Improper recycling and illegal disposal of electronics

In 2012 and 2013, the DNR has continued to receive occasional complaints about individuals who have been collecting electronics on a small scale and not handling them properly. The problems almost always involve cathode ray tubes from older TVs and computer monitors, which contain leaded glass and are expensive to recycle. Complaints have included at least two small stockpiles of CRTs and leaded glass that were found by landlords and cleaned up through responsible recyclers; electronics illegally dumped outside of landfill gates and on public lands; and illegal burning of unwanted components of electronics, such

Beyond the complaints received, many local governments report that they continue to see illegal dumping of used electronics. Thirty percent of the 419 local governments that responded to the 2013 local government survey had seen electronics illegally dumped in their communities. Most of these had only seen electronics dumped one or two times a year or once every few months. Respondents were mostly seeing whole/intact devices or a mix of intact and smashed devices. This seems to indicate that the devices were dumped to avoid a collection fee or inconvenient drop-off location, rather than being dumped after valuable components were harvested. Just under half of the local governments that have seen illegal dumping of electronics said the number of dumped devices has increased since the electronics disposal ban took effect in September 2010.

The local government observations do not match the findings of the DNR's 2012 survey of landfill and transfer station operators and 2011 survey of public lands managers. About half of landfill and transfer station operations responding to the 2012 survey had seen electronics illegally abandoned at their facilities, and about 80 percent were seeing some electronics in trash loads arriving at their facilities. In both surveys, respondents reported the amount of dumping remained about the same after the disposal ban took effect. Landfill and transfer station operators also reported that the number of electronics they were seeing in trash loads had decreased since the ban took effect.

The difference among these survey findings shows how localized dumping issues can be. The 2013 local government survey responses were anonymous, with no demographic information collected, so we cannot say if dumping appears to be more prevalent in rural or urban areas, or in a particular region of the state with few collection sites or high collection fees.

In addition to illegal dumping, many local governments reported seeing other types of illegal or improper electronics disposal, such as electronics put on the curb or in trash receptacles. The majority of the governments that responded to the 2013 survey had not taken any enforcement actions against those who improperly disposed of electronics. The governments that did take action distributed educational materials (such as stickers on TVs that had been put on the curb) or issued verbal warnings to residents attempting to put electronics in the trash. Only a handful of governments have issued written warnings, reported illegal disposal to law enforcement, or issued citations or fines. Several survey respondents commented on how difficult it is to pin responsibility on anyone when they find dumped electronics.

Survey results

More detailed reports on the surveys discussed in this section are available on the E-Cycle Wisconsin program results page at <http://dnr.wi.gov/topic/ecycle/wisconsin.html#tabx2>.

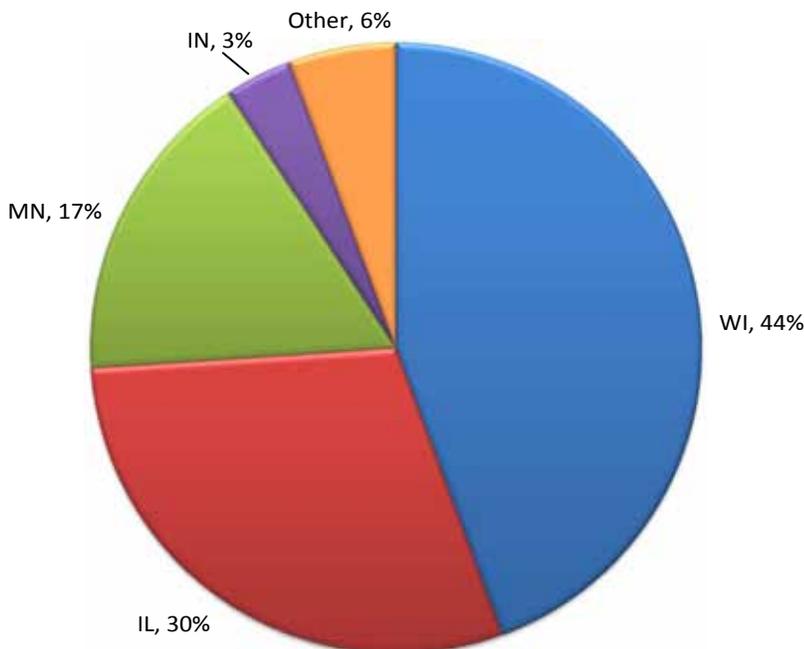
Economic impacts

The electronics recycling industry has grown rapidly in the United States and around the world in the last decade. Wisconsin and neighboring states are home to several electronics recyclers considered leaders in the industry, and the electronics recycling laws passed by Wisconsin and neighboring states (including Illinois, Indiana, Michigan and Minnesota) seem to be encouraging expansion and job creation among recyclers because of the large, steady volume of electronics collected under these programs.

Nearly all electronics collected under E-Cycle Wisconsin have been processed in the upper Midwest. Figure 16 illustrates this for program year 4, when 94 percent, by weight, of electronics collected under the program were initially processed in Illinois, Indiana, Minnesota and Wisconsin. Wisconsin recyclers processed the largest share of any state (44 percent), with the next largest share being processed in Illinois (30 percent). Most of the remaining electronics were processed in Ohio, with small amounts processed initially in other states.

As noted earlier, the DNR continues to receive inquiries from individuals looking to start electronics recycling businesses and/or to join the E-Cycle Wisconsin program. The overall trend, though—in both Wisconsin’s program and the industry as a whole—has been toward consolidation and electronics being processed in large facilities that have made major capital investments in specialized equipment, such as shredders and optical sorters.

Figure 16: Percent of program year 4 pounds received by registered recyclers, by state



The degree of processing done by Wisconsin-based recyclers ranges from simple hand disassembly to use of large shredders and other specialized equipment. After materials are processed, recyclers send the resulting commodities and components to domestic and global markets.

Many of the metals, such as aluminum and steel, are recycled through other processors in the United States and are essential to supporting these recycling industries. This includes several large metal recycling facilities with operations in Wisconsin that benefit from these materials. Precious metals are sold to over-

sees refineries, and most precious metals from Wisconsin are sent to a Belgian facility. Other precious metal refining companies are located in Sweden, Germany, Canada and Japan.

Since cathode ray tubes are one of the most economically challenging materials for recyclers to manage, only two Wisconsin recyclers have invested in equipment to separate, clean and process the leaded and unleaded glass CRTs contain. Some in-state recyclers send whole TVs and monitors downstream for processing. Other recyclers disassemble TVs and monitors to remove the plastic housing, wire and metal components and send the intact CRTs to another recycler for further processing.

Once CRT glass is separated and cleaned, the cullet from panel (unleaded) glass is not considered hazardous. It can be used in a variety of products, such as fiberglass, sandblasting abrasives, ceramic tiles and road aggregates. There are fewer options for recycling the funnel glass, which contains around 25 percent lead by weight. Some recyclers still send leaded glass from Wisconsin to a glass-to-glass furnace, so it can be made into new CRTs, but these markets have dwindled and cannot accommodate all of the CRTs being recycled. Another option is to send the leaded glass to a lead smelter. Wisconsin recyclers that use this option typically send their leaded glass to Doe Run, in Missouri, the only lead smelter currently operating in the United States. There are two other lead smelters in Canada.

Recyclers remove plastic from electronics manually or through a shredding process. Most U.S. recyclers sell mixed loads of different grades of plastics to brokers for export to international markets. According to the U.S. International Trade Commission's 2011 study on U.S. e-waste exports, China received nearly half of this plastic, Hong Kong received 27 percent and Canada received 10 percent.

Local government costs

Before the electronics recycling law passed in 2009, many local governments set up electronics collection programs to serve their residents. While many of these programs charged consumers some fee for taking the electronics, most were primarily funded by taxpayers.

Four years into the E-Cycle Wisconsin program, local governments are still a critical part of collection infrastructure, especially in rural areas. While many local governments have been able to reduce their collection costs, or hold them steady despite a dramatic increase in the amount and types of electronics they collect, the DNR's 2013 local government survey found that the electronics recycling law has not yet produced the hoped-for cost savings across the board.

More end markets information

The Minnesota Pollution Control Agency commissioned an analysis of end markets for material collected under Minnesota's electronics take-back program, and much of the information is applicable to Wisconsin as well. For more information about this report, contact the MPCA at electronics.pca@state.mn.us.

Figure 17: Effects of E-Cycle Wisconsin on local government collection costs

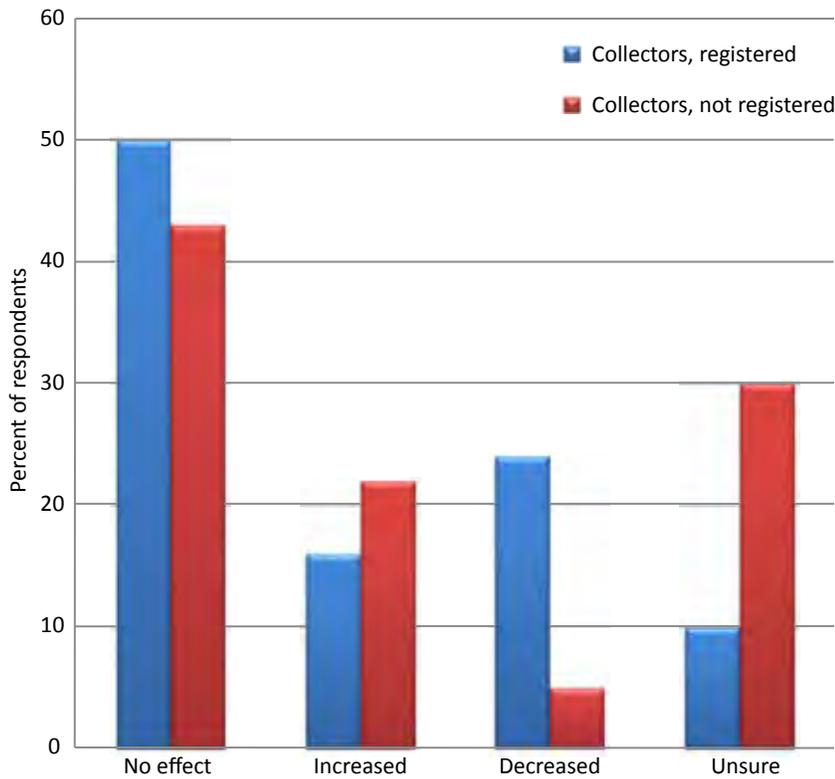
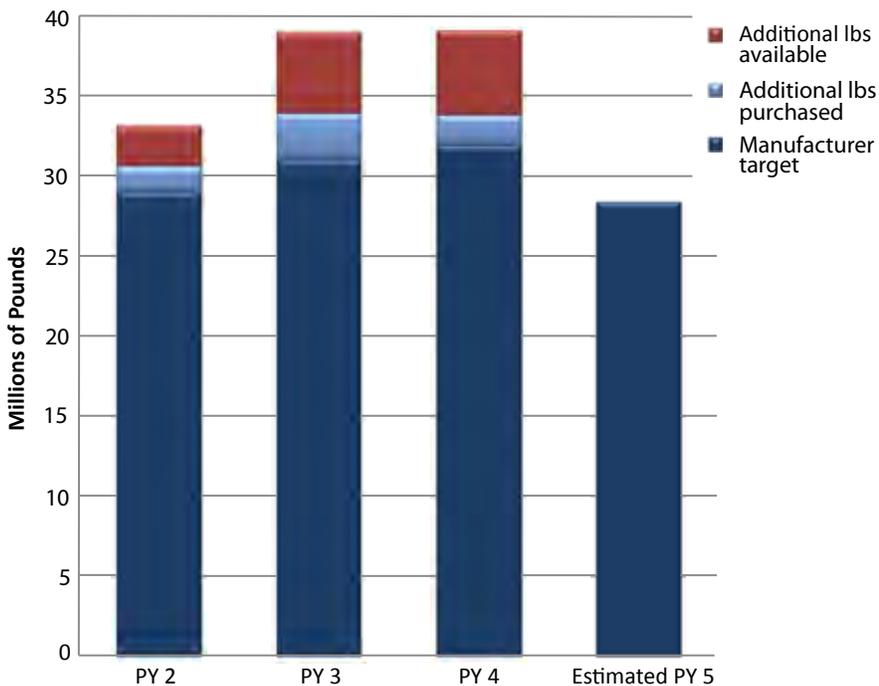


Figure 18: Comparison of weight collected and manufacturer targets, by program year



Overall, nearly half of the survey respondents that collect electronics said the electronics recycling law has had little to no effect on their collection costs, while 20 percent said the law has raised their costs. However, local government collectors registered with E-Cycle Wisconsin have noticed slightly different results. While 50 percent have seen no effect on costs, nearly a quarter have seen costs decrease (see Figure 17). None of the collection programs with the highest costs (more than \$10,000 a year) have seen their costs rise since E-Cycle Wisconsin began, and three of these collectors have actually seen their costs go down.

Based on these results, the DNR is planning additional outreach to local governments to make sure they understand their collection options under the recycling law and are aware of the benefits of collecting under E-Cycle Wisconsin. Most of the governments collecting outside of E-Cycle Wisconsin appear to be small, so they would not likely add significantly to the overall weight collected, but these governments could potentially reduce their costs and ensure responsible recycling of collected electronics.

Policy recommendations

Below is a discussion of issues and recommendations for components of the law the DNR is asked in s. 287.17(10)(c) to review, along with topics that arose from stakeholder discussions.

In evaluating whether changes might be needed to make the electronics recycling law function better for stakeholders or the public, the DNR has gathered input through surveys of and conversations with participant groups, stakeholders and the public. The E-Cycle Wisconsin 2012 Report described several issues these conversations and surveys brought to the DNR's attention and outlined related policy recommendations. Many of the same issues remain, and so several recommendations are similar to those in the 2012 report, though they have been updated with information gathered in the past year.

Manufacturer target calculation

Wisconsin's law is designed to operate on free-market principles, with collectors, recyclers and manufacturers conducting private negotiations to set recycling prices. In theory, supply and demand should help find the correct price manufacturers pay for recycling.

In practice, what has happened in program years 3 and 4 is that overall collection has significantly outpaced the overall manufacturer recycling target (see Figure 18). This is putting downward pressure on the price per pound recyclers can charge. At the same time, diminishing markets for CRT glass are increasing recycling costs, and revenues received for some commodities have declined.

This gap between collection and targets may grow in program year 5 and future years because of trends in the electronics market. Consumers have been switching from larger, heavier desktop computers to laptops, tablets and smartphones. Manufacturers have also found ways to make products such as TVs and laptops lighter. For example, the average weight of a 40-inch LCD TV has declined from 65.5 to 50.1 pounds in recent years, according to data compiled by the National Center for Electronics Recycling. Overall sales of many types of devices, including TVs, have also declined in recent years, according to the Consumer Electronics Association. As a result of these trends, the estimated overall manufacturer target for program year 5 is 28.4 million pounds, down from nearly 32 million pounds for program year 4.

We expect the weight of electronics collected for recycling to decline once older, heavier devices are cleaned out of basements and garages. Some recyclers estimate this will happen within the next five years. Therefore, we anticipate that pounds collected may exceed manufacturer targets for at least the next few program years.

Some manufacturers (especially IT manufacturers) have also expressed concerns about the fairness of the current target formula, given that TVs dominate the pounds collected by weight under E-Cycle Wisconsin.

DNR recommendation: manufacturer targets

Given that there is currently no clear better alternative and a lack of consensus among stakeholders, leave manufacturer target calculations the same for now,

To gain a firmer understanding of how the mix of products being recycled under E-Cycle Wisconsin compares to the mix of products being sold, change the manufacturer registration and reporting requirements in s. 287.17(5)(a) and (b) to require manufacturers to break their sales data report into TVs and IT equipment (all covered devices except TVs). Then, have them report the pounds recycled on their behalf by TVs, computer monitors, computers, printers and other eligible electronic devices.

Add a similar requirement for recyclers under s. 287.17(8)(b) to report the material they processed by five product categories: TVs, computer monitors, computers, printers and other eligible electronic devices.

DNR recommendation: manufacturer fees

Change registration fee levels in s. 287.17(4)(b) to the following:

- \$5,000 if the manufacturer sold 500 or more covered electronic devices in this state during the last program year.
- \$1,250 if the manufacturer sold 250 to 499 covered electronic devices in this state during the last program year.
- \$0 if the manufacturer sold fewer than 250 covered electronic devices in this state during the last program year.

Do not change how manufacturer shortfall fees are calculated. The graduated scale, ranging from 30 to 50 cents, is sufficient to encourage manufacturers to recycle eligible electronics, rather than pay a fee to the state.

DNR recommendation: rural incentive

To supplement the current rural incentive, amend s. 287.17 to set up a grant program, using manufacturer shortfall fees and a portion of registration fees, to help fund drop-off sites or collection events in rural areas, with priority given to areas that have had no collection under E-Cycle Wisconsin or only sporadic collection events. If, in the future, all counties have permanent collection sites, grants could focus instead on improving collection in more urban areas, such as making curbside pickup available to residents unable to transport electronics to a drop-off site.

Changing the way manufacturer targets are calculated is one possibility for addressing this issue, and is being considered by states like Minnesota. Among state programs, however, there is no clear best model for setting manufacturer obligations. Therefore, it might be difficult to find consensus on how Wisconsin's target formula should be changed. For a more complete discussion of this issue and possible target alternatives, see the E-Cycle Wisconsin 2012 Report.

Manufacturer registration fees

The graduated fee system (\$0 if fewer than 25 covered devices sold in Wisconsin; \$1,250 if 25 to 249 devices sold, and \$5,000 if 250 or more devices sold) has generally worked well, allowing very small manufacturers and manufacturers just beginning to sell covered electronics to pay no fee. Through outreach to retailers, however, the DNR has found that many small electronics retailers are still manufacturing a small number of desktop computers under their own brand. While some are below the 25-unit threshold, others may be slightly above this and thus might have to pay a registration fee that is quite large per unit sold. If the threshold for not paying a registration fee and the reduced fee level (\$1,250) were raised, it could encourage compliance among smaller manufacturers and make the per-unit costs more equitable.

Rural incentive

Only 9 percent of collectors and 6 percent of recyclers that responded to DNR surveys in May 2012 said the law's incentive of counting 1.25 pounds for every pound collected in rural counties has encouraged them to collect in those areas. Meanwhile, though the number of registered collectors and collection sites has increased dramatically, one county (Florence) has had no registered collection sites, and several others have had only a few collection events.

Based on this, it appears the rural incentive may not be as effective at increasing rural collection as the law's drafters hoped, and it reduces the number of actual electronics that need to be collected. One option to address this issue in future years would be to eliminate or scale back the rural incentive. In the meantime, a targeted grant program could help further encourage collection in some of the most underserved areas.

Adding covered devices

As consumer electronics evolve, the DNR will continue to evaluate whether new or significantly changed types of devices should be added to the lists of covered or eligible electronic devices under the law. While the DNR does not recommend adding devices at this time, there are a few types of devices that should be looked at more closely over the next year or two.

Cell phones—and smartphones in particular—have been playing a larger and larger role in the electronics market. Smartphones were just starting to become popular when Wisconsin’s law passed in 2009, and have since—along with tablets—been replacing desktop and laptop computers for many consumers, at least in part. Trade journals report that the PC market has been declining because of direct competition from smartphones and tablets.

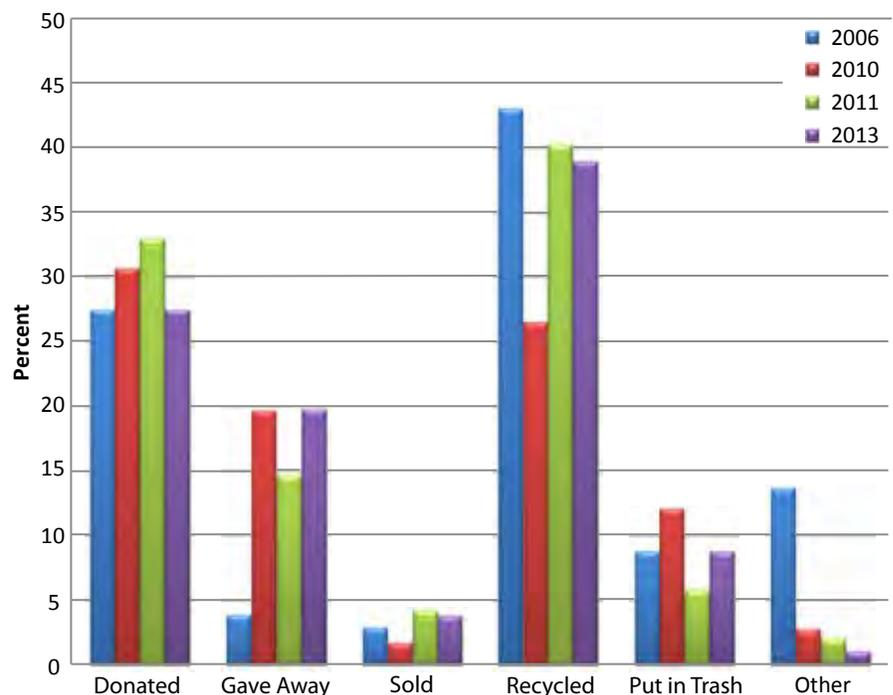
While the DNR has determined that tablets meet the definition of a consumer computer under s. 287.17(1), and are thus covered electronic devices, it has not yet made a similar determination for smartphones. Manufacturers do not include cell phone sales in their target calculations, and cell phones cannot be recycled to meet manufacturer targets, though the electronics recycling law did ban cell phones from disposal in Wisconsin. Smartphones do seem to meet the definition of a consumer computer, however, and in some cases have been marketed as computers that can be hooked up to larger screens.

The average replacement time for cell phones is 18 months, according to figures cited by the U.S. Environmental Protection Agency and others. Outside of E-Cycle Wisconsin, there has been a relatively strong recycling system for cell phones, with many phone retailers, charities and others collecting them. Most collectors and recyclers participating in E-Cycle Wisconsin also collect them, but keep the phones separate from eligible electronics. Many retailers and websites also offer buy-back programs, especially for smartphones, since consumers are replacing phones so often.

Despite this, the DNR’s latest statewide household survey indicated that consumers continue to put cell phones in the trash at a higher rate than TVs and computers (see Figure 19). This rate has remained relatively unchanged since the electronics recycling law and disposal ban went into effect, while the disposal rates for TVs and computers have declined, indicating that more recycling options and consumer education may be needed.

There have also been reports from recyclers and repair technicians that smartphones are becoming more difficult to reuse

Figure 19: Wisconsin household cell phone disposal method



DNR recommendation: adding covered devices

Do not add covered devices to the law at this time, but continue to evaluate the possibility of adding cell phones, including smartphones; portable DVD players; video game consoles; or other types of devices to address changes in technology and balance manufacturer obligations between TV and IT equipment.

and recycle because of product designs that use glues or other materials that make part replacement and disassembly more difficult. Including the phones in Wisconsin's product stewardship law would give manufacturers more responsibility for ensuring their products are properly recycled at the end of their useful lives.

If, in the future, the DNR were to update its guidance to include smartphones in the definition of consumer computers, they would be added as both covered electronic devices and eligible electronic devices. This would mean that smartphone manufacturers would need to register with the DNR, and their recycling targets would include the weight of smartphones sold to Wisconsin households and schools. It would also mean smartphones could be recycled to meet those targets.

This would leave more traditional cell phones outside of E-Cycle Wisconsin, and could lead to confusion among consumers, collectors and recyclers. Therefore, it would be a more straightforward approach to add all cell phones to the list of covered electronic devices (and therefore eligible electronic devices) in s. 287.17(1).

Nearly all major cell phone manufacturers are already registered under E-Cycle Wisconsin because they sell tablets and/or other covered devices, so such a change would not significantly affect the number of registered manufacturers, and in most cases would not result in additional registration fees. It would, however, increase the recycling targets of cell phone manufacturers.

Two other device types that could be added to the list of covered electronic devices in the future are portable DVD players and video game consoles. These are very similar to other devices already covered under the law. Portable DVD players are similar to other video display devices, but the definition of "video display device" under s. 287.17(1) does not seem to cover them. Most other states with similar definitions, including Minnesota, have chosen to include portable DVD players in their list of covered devices, and several manufacturers have tried to register the players with E-Cycle Wisconsin. Video game consoles now function much like computers, and several other states have included them in definitions of covered electronics. Adding the DVD players and game consoles would create more of a balance between TV and IT equipment on the list of covered electronics.

Adding covered entities

Currently, E-Cycle Wisconsin includes K-12 public schools and private schools participating in the Parental School Choice Program in Milwaukee and other districts. Making all K-12 schools eligible under E-Cycle Wisconsin would be a more consistent approach, make outreach simpler and provide recyclers with another source of potentially

higher-value material (more IT equipment than in the general consumer mix, which could help lower overall recycling costs).

Collector “cherry picking” of valuable devices and components

Recyclers and manufacturers have expressed concern about collectors “cherry picking” valuable devices, such as desktop computers, or partially dismantling electronics to remove valuable components before sending loads to a registered recycler. This makes the overall cost of recycling electronics under the program more expensive, and broken or dismantled devices pose safety hazards to workers.

In an effort to begin addressing this problem and other potential site management issues, the DNR significantly increased its inspections of registered collection sites in 2013. By the end of program year 5, E-Cycle Wisconsin staff plan to inspect all permanent collection sites (with the exception of some that are multiple locations of a large chain of similar locations, such as electronics retailers). The DNR will also be putting together a package of new collector outreach materials, including a video showing best management practices. If cherry-picking remains a problem after this increase in inspections and outreach, the DNR will revisit the issue in a future report.

Conclusions

Four years after Wisconsin’s electronics recycling law took effect, it appears to be fulfilling its goals. The manufacturer-funded E-Cycle Wisconsin program is achieving one of the highest per capita collection rates in the country. A competitive market has developed for recycling electronics under the program, greatly expanding the number of electronics collection sites available to consumers and offering free or low-cost recycling opportunities. Wisconsin’s law and similar measures in neighboring states have spurred growth of the electronics recycling industry in the upper Midwest, and the DNR continues to make progress in ensuring that e-cycling is being done in a responsible manner.

There are, however, several issues that have a potential to erode the law’s success, and therefore require close monitoring.

- The increasing cost of properly managing leaded glass from cathode ray tubes, combined with the fact that more valuable materials, such as desktop computers, are being diverted from E-Cycle Wisconsin into a more informal recycling system, is driving up costs for many recyclers.
- Strong collection efforts under E-Cycle Wisconsin are outpacing manufacturer recycling obligations, putting downward pressure on prices manufacturers pay for recycling. This is in addition to the fact that manufacturers faced with complying with electronics

DNR recommendation: adding covered entities

Modify the definition of “school” under s. 287.17(1)(np) to allow all K-12 schools in Wisconsin to recycle electronics through E-Cycle Wisconsin. An alternative would be to remove schools entirely from the program, because they are required by existing hazardous waste laws to properly manage most electronics.

DNR recommendation: collector cherry picking

Encourage registered recyclers to work cherry-picking problems out with the collectors they receive materials from. Plan to revisit this issue with recyclers in a year to determine if program-wide changes need to be made.

In the meantime, the DNR will continue its expanded inspection and outreach efforts to make sure collectors understand and are following requirements and best management practices for handling electronics they collect.

recycling laws in two dozen states are looking to improve efficiency and reduce per pound costs.

- State and local officials are still seeing illegal dumping of electronics throughout Wisconsin, and small-scale electronics recyclers and scavengers sometimes take on more they can handle, posing risks to human and environmental health.
- Many local governments are still collecting electronics outside of E-Cycle Wisconsin, meaning they have not seen the cost reductions that governments registered as collectors have seen. Many local government officials are not fully aware of resources the DNR has available to help them educate their residents.
- Many electronics retailers are still not meeting the customer education requirements of the law.
- The DNR's 2013 household survey showed that many state residents are still not aware of the electronics recycling law and do not know where to take electronics for recycling.

To address these challenges, the DNR is recommending some legislative changes and is adjusting its compliance assistance and outreach efforts. The DNR has increased its inspections of collection sites and will be creating new compliance assistance resources to help ensure electronics collected under the program are being managed properly. The DNR will also be working more closely with electronics retailers, and improved customer education at electronics stores could improve overall awareness of the law. The DNR will continue to target new audiences with its own public education efforts.

Electronics are becoming more and more central to our lives, and the types of electronics we use continue to change quickly with innovation. The electronics recycling industry—still very young—is growing and maturing. It will be important to keep this big picture in mind as we continue to implement and monitor the success of the E-Cycle Wisconsin program and electronics disposal ban.



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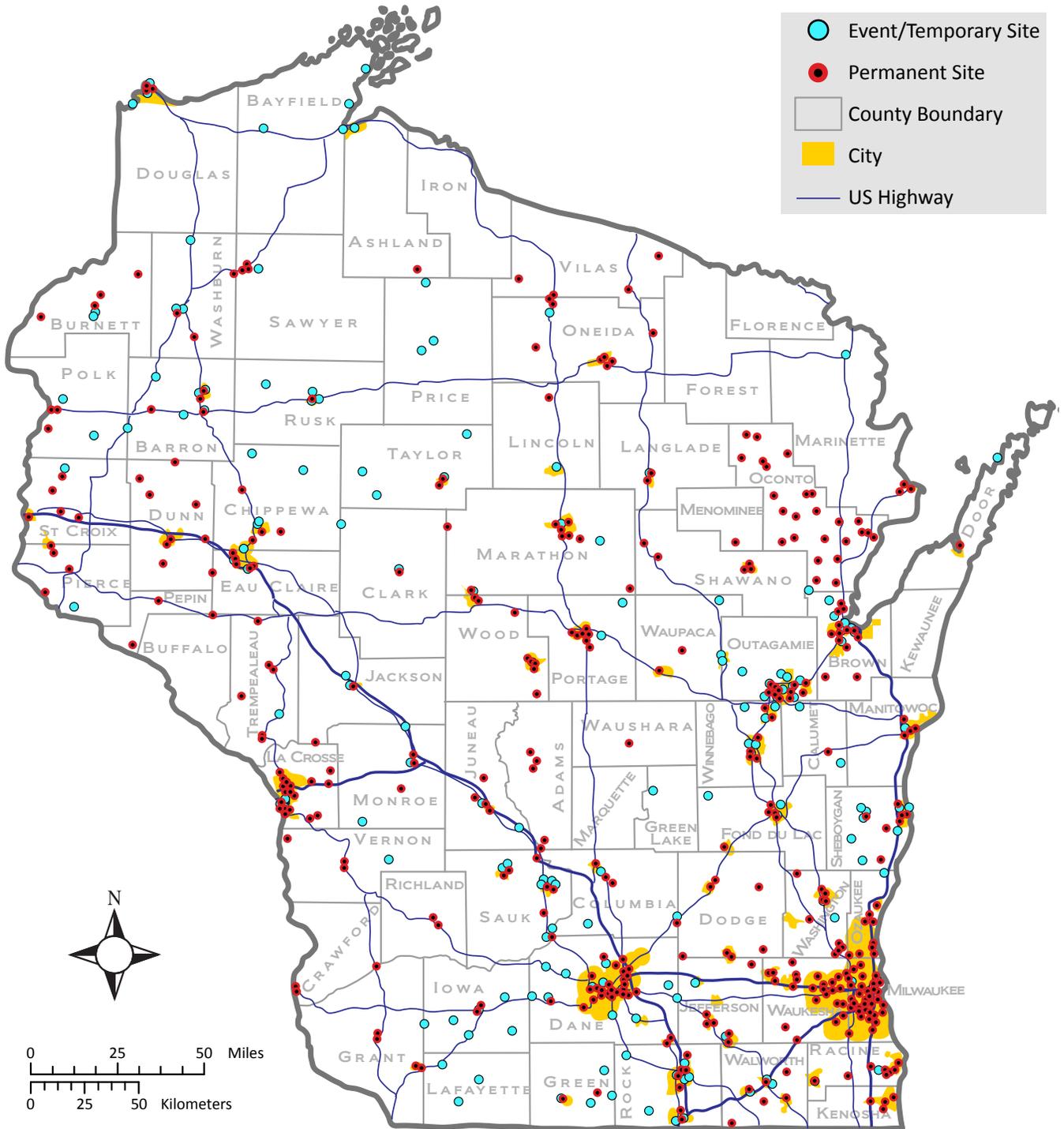
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Bureau of Waste and Materials Management**

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This publication is available in alternative format (large print, Braille, audiotape etc.) upon request. Please call (608) 266-2111 for more information.

Appendix A: Map of collection sites registered under E-Cycle Wisconsin during program year 4



Revised: October 28, 2013