



E-Cycle Wisconsin 2010 report

Wisconsin Department of Natural Resources Waste and Materials Management Program
April 2011

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, certain electronics—including televisions, computers, printers, fax machines, VCRs and DVD players—could no longer be put in the trash or sent to landfills and incinerators in Wisconsin. While the new recycling program and disposal bans have only been in effect for a short time, they have already increased consumer access to electronics recycling and expanded business opportunities for the electronics recycling industry in Wisconsin and nearby states.

The DNR did not keep records of electronics collectors and recyclers before the law took effect. Based on the number of E-Cycle Wisconsin registrations since January 2010, however, there has been a dramatic increase in electronics collection sites available to residents. By spring 2011, nearly 150 businesses, non-profits and local governments were registered collectors. They had established nearly 350 collection sites in 65 of Wisconsin's 72 counties, covering 98 percent of the state's population. By contrast, a 2003 UW-Extension study found electronics collection sites in only 30 counties.

Collection under the program began slowly but picked up as more convenient and less costly recycling options became available, the disposal bans took effect, and the new law was publicized. During 2010, recyclers processed more than 24 million pounds of eligible electronic. During program year 2, which runs from July 1, 2010, to June 30, 2011, the total is expected to be about 29 million pounds.

Total 2010 eligible pounds

Eligible pounds Jan. 1 to June 30	10,328,779
Eligible pounds July 1 to Dec. 31	13,839,324
Total eligible pounds	24,168,103
Pounds per capita	4.2

Three-quarters of active collectors charged consumers fees to recycle at least some electronics during the first partial program year (Jan. 1 to June 30). Responses to a DNR survey suggest anything more than minimal fees could deter many residents from recycling electronics. Feedback from collectors and recyclers indicates the fees are starting to diminish, and a growing number of collectors are accepting electronics for free. The relationship between recycling fees and consumer participation will be something to watch as the program matures.

Several collection and recycling businesses have started or expanded because of E-Cycle Wisconsin, providing a solid infrastructure for growth in the volume of electronics collected and recycled. We have seen good public response to the program from our outreach efforts and expect awareness and participation will continue to increase.

E-Cycle Wisconsin's first year established that manufacturers, retailers, collectors, recyclers, local governments and individuals can work together under a shared responsibility system to increase the recovery of electronic devices. Increased recovery and responsible recycling reduce environmental risks and ensure that valuable materials and embedded energy in these electronic devices are not lost to landfilling, but are returned to productive use by industries in Wisconsin and elsewhere.

Introduction

Wisconsin's electronics recycling law establishes a statewide program, called E-Cycle Wisconsin, to collect and recycle certain electronics. It is based on a product stewardship approach, which assigns primary responsibility for collection and recycling to manufacturers. To support recycling and minimize disposal, the law bans certain electronics from Wisconsin landfills and incinerators after Sept. 1, 2010.

Under the law, manufacturers of TVs, computers and desktop printers must register the brands they sell to households and schools in Wisconsin, and recycle a number of pounds of electronics each year based on their sales. Manufacturers typically contract with registered recyclers and collectors to meet their annual recycling targets.

The first program “year” ran from Jan. 1 through June 30, 2010. (Subsequent program years will coincide with the state’s fiscal year, which runs from July 1 to June 30.) The following is an informal report of some of the program’s results during calendar year 2010, the first full year the electronics recycling law was in effect.

Program participation

Table 1: E-Cycle Wisconsin program participation (PY = program year)

	Number registered PY1	Active in program PY1	Number registered PY2 as of April 1, 2011
Collectors	123	77	144
Collection sites	305	n/a	340
Recyclers	28	15	23
Manufacturers	72	n/a	77
Brands	114	n/a	118

Manufacturer and brand registrations in Wisconsin (see Table 1) have been roughly in line with registrations in Illinois, Indiana, Michigan and Minnesota when taking differences in the range of covered products into consideration. All of the most-recognized brands of consumer electronics were registered during program year 1. A number of small brands registered in other states did not register in Wisconsin; the DNR is continuing to follow up using contact information from other states.

By the end of program year 1, 123 collectors and 28 recyclers had registered to participate. Of these, about two-thirds of the collectors and just over half the recyclers were active, meaning they reported collecting or recycling electronics under the program (see Table 1). Half of the recyclers had at least one recycling facility in Wisconsin, and almost all had a recycling facility in the upper Midwest.

Figure 1: E-Cycle Wisconsin year 1 registered collectors, by type

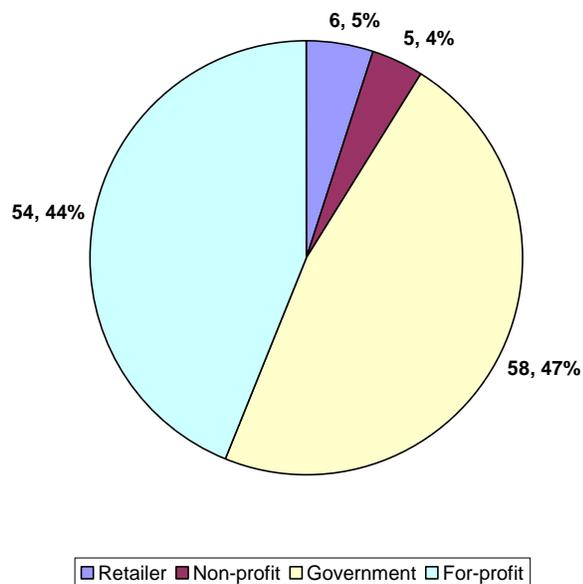
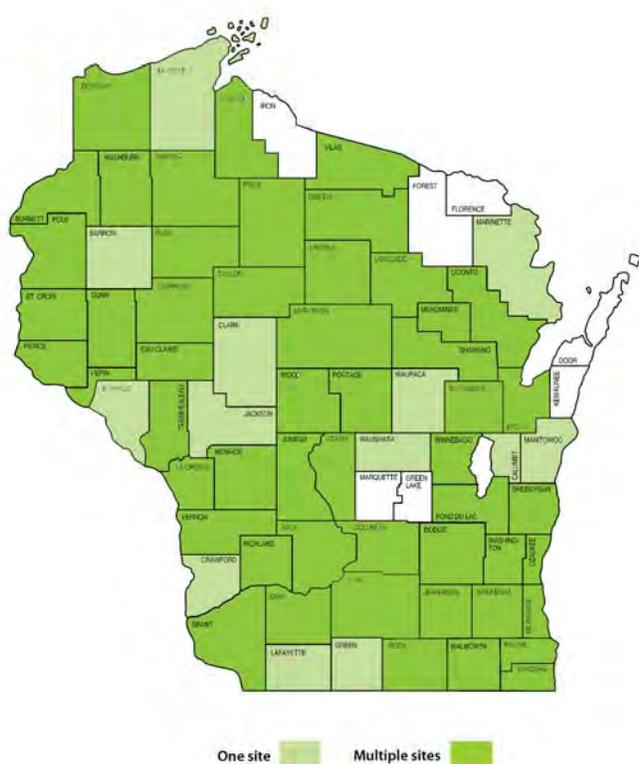


Figure 2: E-Cycle Wisconsin collection site distribution, 2010



The majority of the 123 registered collectors were local governments (counties, cities, villages or towns) or businesses (waste management companies, electronics recyclers and small businesses set up to collect electronics). (See Figure 1.) Although only a small number of electronics retailers and non-profits registered as collectors, several of these had multiple collection locations around the state.

During program year 1, there were collection sites (either permanent drop-off sites or temporary sites/special collection events) in 61 of Wisconsin’s 72 counties. Just over one-third (103) were in counties designated as rural by the electronics recycling law. Figure 2 shows the distribution of collection sites by county at the end of 2010, when there were sites in 65 of 72 counties, meaning 98 percent of the state’s population lived in a county with at least one electronics collection site. By contrast, a 2003 study found that only 30 counties had at least one electronics collection site.¹

During program year 2, the number of registered collectors and collection sites has continued to grow (see Table 1). The number of registered recyclers has dropped slightly as the DNR more strictly enforced the requirement that recyclers maintain proof of financial responsibility—meaning they have money set aside for the costs to close and clean up their facilities should they go out of business.

2010 collection

Table 2 shows the amount of eligible electronic devices (EEDs)² collected between Jan. 1 and June 30, 2010, based on reports submitted by registered collectors. The “pounds not sent to registered recyclers” column represents electronics that were either diverted for reuse or sent to recyclers not participating in E-Cycle Wisconsin.

Table 2: Program year 1 EED collection, in pounds

Urban lbs	Rural lbs	Total lbs sent to registered recyclers	Lbs not sent to registered recyclers	Total lbs EEDs collected
9,328,246	994,366	10,322,612	88,047	10,410,659

Table 3 shows the program year 1 pounds that were eligible to be counted toward manufacturers’ recycling obligations and the weight that was actually counted toward the obligations. The urban and rural pounds are slightly lower than in Table 2 because a small portion of what was collected was not received by recyclers until after July 1 and thus will be counted toward program year 2 obligations.

¹ Wisconsin End-of-Life Electronics Study conducted for the UW-Extension Solid and Hazardous Waste Education Center, <http://www4.uwm.edu/shwec/publications/cabinet/specialwastes/ComputerandElectronicStudy2003.pdf>.

² EEDs include televisions and computer monitors with screens of at least 7” in the longest diagonal direction, desktop and laptop computers, desktop printers, other computer accessories, fax machines, DVD players, VCRs, and DVRs.

There was a significant gap (763,514 pounds) between what was eligible to be counted toward manufacturer recycling obligations and what was actually counted. We believe this was due mostly to the slow development of relationships between recyclers and manufacturers during the short program year. In particular, some smaller recyclers that had not worked with manufacturers before had difficulty setting up relationships under the program.

For program year 1, the number of all eligible pounds, including weight not counted by manufacturers, was less than the manufacturer obligation of about 15 million pounds. To determine the obligation, manufacturers reported their total sales of covered devices to Wisconsin households and schools between July 1, 2007, and June 30, 2008, multiplied by 0.8 (the standard multiplier) and then 0.5 (because of the 6-month program year).

Table 3: Eligible program year 1 pounds

Urban lbs	Rural lbs	Rural lbs x 1.25	Lbs diverted for reuse	Total eligible recycled lbs	Lbs counted for manufacturer credit
9,276,020	932,397	1,165,497	112,738	10,328,779	9,565,265

Conversations with stakeholders have provided several reasons why the program year 1 collection was lower than expected:

- Many collectors, recyclers and manufacturers had trouble getting plans and contracts in place to begin full-scale collection when the program year began Jan. 1, 2010. (The law was signed at the end of October 2009.)
- The early part of the year is typically one of the slowest times for electronics collection. Many collectors and recyclers saw activity pick up significantly toward the end of the program year.
- Manufacturers did not have to pay shortfall fees if they failed to meet their recycling targets for program year 1.
- The disposal ban on TVs, computers and other electronics did not go into effect until after program year 1, and full-scale outreach efforts by the DNR and others did not get underway until the summer. Awareness of E-Cycle Wisconsin was thus relatively low among the general public during the first months of 2010.

During the second half of 2010, the rate of collection increased substantially. Table 4 shows the total eligible pounds recycled under the program during 2010, based on the program year 1 annual reports and program year 2 mid-year reports submitted by registered recyclers. (These totals have the 1.25 pound rural credit factored in.) The number of eligible pounds recycled in the second half of 2010 was up 34 percent from the first half.

Table 4: Total 2010 eligible pounds

Eligible pounds Jan. 1 to June 30	10,328,779
Eligible pounds July 1 to Dec. 31	13,839,324
Total eligible pounds	24,168,103
Pounds per capita	4.2

The annual per capita collection rate of 4.2 pounds is lower than those seen in Minnesota, Oregon and Washington. However, we expect the totals for program year 2 to be higher due to the upward trend in collection and the fact that manufacturers will now face penalties for not meeting their recycling targets. The estimated total manufacturer recycling obligation for program year 2 is 29 million pounds, or about 5.1 pounds per capita. (This obligation is based on sales between July 1, 2008, and June 30, 2009.)

Program year 1 collection analysis

One interesting note on program year 1 collection is that non-profits and electronics retailers collected nearly half the total EED pounds, despite making up only 9 percent of the collectors. This was largely due to collection efforts previously established by Best Buy and many Goodwill stores.

The percentage of total EED pounds collected by local governments was much less than their overall representation among collectors, but it is important to note that many government collection sites serve rural areas of the state. It is also important to note that in

several cases, local governments partnered with for-profit businesses on collection events or drop-off sites, so the difference in collection amounts attributed to these two groups is probably less than indicated in Figure 3.

Collectors were not required to provide a breakdown of what they collected by product type (TV, computer, etc.). However, about a third of those who reported collection totals did provide this breakdown, which gives a rough picture of the types of electronics being collected under E-Cycle Wisconsin (see Table 5). About three-quarters of the electronics collected by weight were TVs or computer monitors, about 10 percent were computers, and the remaining 16 percent were other eligible electronics. This breakdown is similar to that seen in other states with collection programs.

Table 5: Program year 1 collection by product type

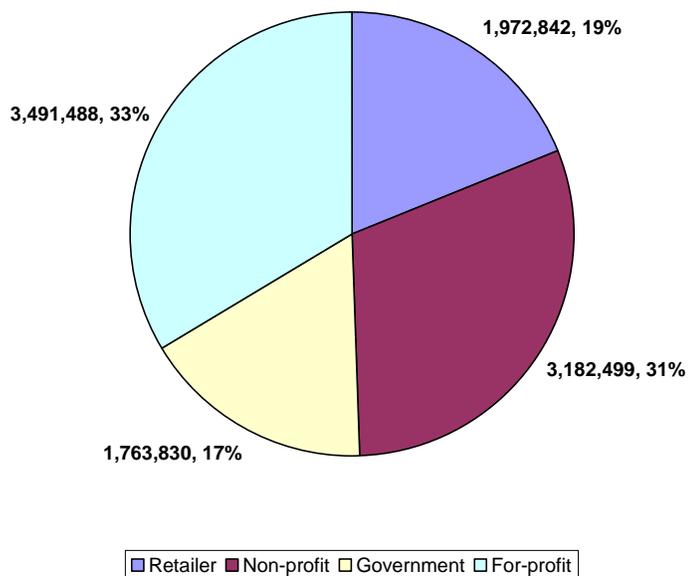
Material	% of total (by weight)
Televisions	55%
Computer monitors	18%
Computers	9%
Other EEDs	16%

Fees charged by registered collectors

A number of state electronics recycling laws require manufacturers to offer free recycling of covered devices. Wisconsin's law does not prohibit collectors from charging fees to accept electronics, and many collectors charged such fees during the first program year to recover their operating costs.

Of the 77 collectors that participated in E-Cycle Wisconsin during program year 1, three-quarters charged some type of fee to accept EEDs. About two-thirds of those charging fees were local governments (see Figure 4).

Figure 3: E-Cycle Wisconsin year 1 EED pounds collected, by collector type



Many collectors varied fees based on the type of item, with some using both per-item and per-pound pricing (see Figure 5). About half charged per pound for at least some EEDs. The majority (79 percent) charged per item for some EEDs—most often for TVs, computer monitors and computers. Some collectors reported having another type of fee, such as a charge only for picking up EEDs at a customer’s home or a system in which collection events were free but permanent collection sites charged fees.

Most of the collectors provided details on the amount charged per item or per pound (see Table 6). Particularly with the per-item charges, most collectors varied their fees depending on the item, and some accepted smaller items for free. Table 6 shows the average, low and high charges for TVs, computer monitors and computers. These items typically had the highest charges. Note: many collectors set differing prices for TVs depending on the size and type, so we first calculated the average price charged by each collector, then took the average of those numbers.

For collectors that reported charging per pound, the average price was \$0.27 per pound, with a range from \$0.10 to \$0.50 per pound.

Feedback from collectors in early 2011 indicates that many are starting to reduce or eliminate fees due to contracts with recyclers that allow collectors to send EEDs to recyclers for free or even receive a small per-pound rebate. These contracts may change if there are significant changes in commodity markets or transportation and processing costs. Collectors will again submit information on fees in their program year 2 annual reports, due Aug. 1, 2011.

Figure 4: E-Cycle Wisconsin collectors charging fees, by collector type

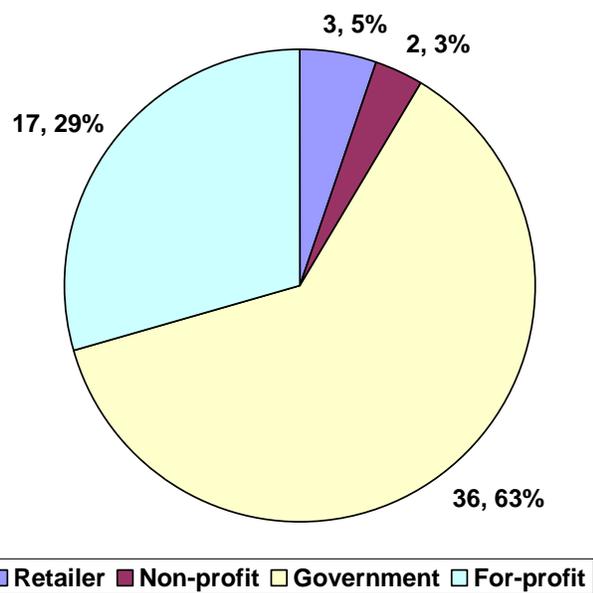


Figure 5: Type of fees charged by collectors, year 1

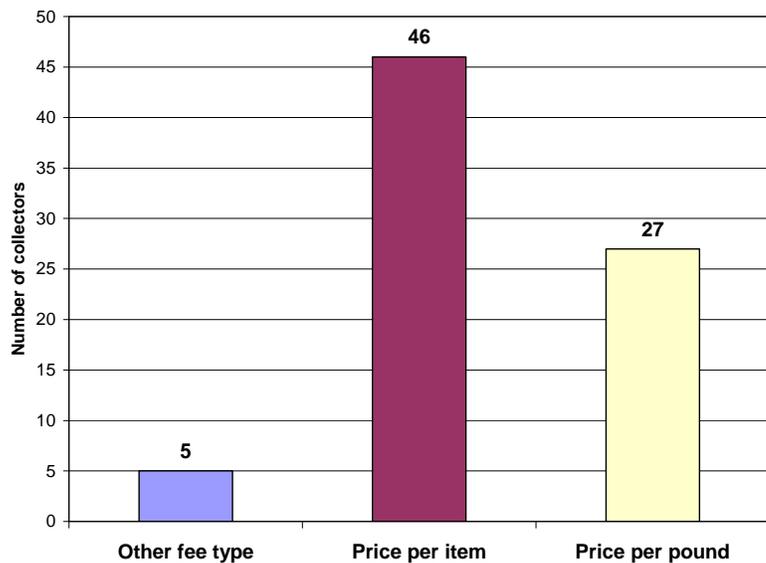


Table 6: Price charged per item

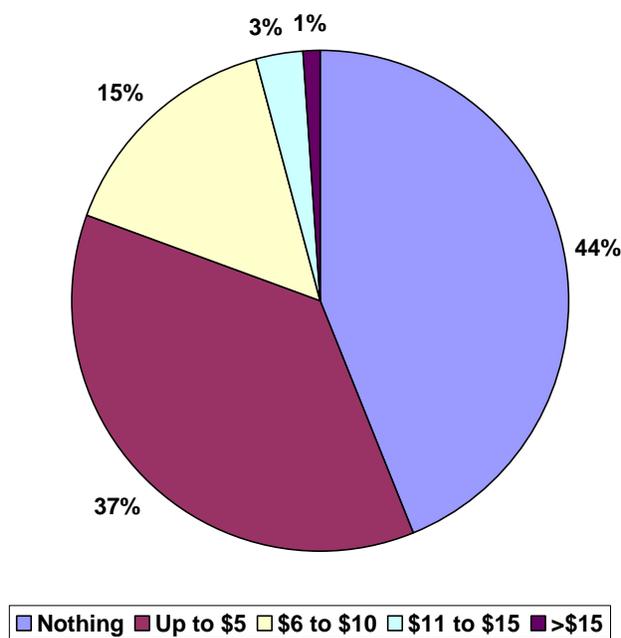
Item	Average	Low	High
Television	\$15	\$1	\$55
Computer monitor	\$11	\$1	\$25
Computer	\$9	\$1	\$25

Consumer awareness and willingness to recycle

Between October and December 2010, the DNR conducted a mail survey of Wisconsin households to measure awareness of the electronics recycling law, learn about how state residents are managing their electronics and get information how we can best promote E-Cycle Wisconsin and make it accessible. The survey, conducted by the UW Survey Center using a representative sample of Wisconsin households, had a strong 58 percent response rate.

The results showed that just over half of households (56 percent) were aware of the electronics disposal bans that went into effect Sept. 1, and about one-quarter (24 percent) had heard of the E-Cycle Wisconsin program. These were encouraging numbers considering the primary publicity for the program and disposal ban began in August. The majority of respondents had received the information from news media, their local recycling program or their waste hauler.

Figure 6: Amount willing to pay per item to recycle electronics



To learn more about the impact collector fees might have on residents' willingness to recycle, the survey asked a series of questions about how much a respondent was willing to pay to recycle electronics.

The results show that most residents would prefer free or low-cost recycling. Only about one-fifth said they were willing to pay more than \$5 per item, and nearly half said they were unwilling to pay anything (see Figure 6). This would indicate that a large portion of the population is not willing to pay the fees many collectors were charging during program year 1.

However, about four-fifths of respondents would be willing to pay a different (possibly greater) amount under certain conditions. Follow-up questions asked if respondents'

answers to the fee question would change if they either were given a coupon or gift card to offset at least part of the fee, or had a guarantee of responsible recycling and safe data destruction. Table 7 shows the breakdown within each fee category of the percentage of respondents who would be willing to pay a different amount if given a coupon or a guarantee of responsible recycling. Overall, just over half would change the amount they were willing to pay with either a coupon or a guarantee, while about one-quarter would only change the amount under one of these scenarios. Only 12 percent said they were not willing to pay anything even with a coupon or guarantee.

Table 7: Likelihood to change amount willing to pay to recycle electronics, by fee category
% of overall respondents shown in parentheses

Amount willing to pay	Change with either	Change with coupon only	Change with guarantee only	Would not change
Nothing	49% (21%)	19% (8%)	6% (3%)	23% (12%)
Up to \$5/item	61% (22%)	16% (6%)	10% (4%)	14% (5%)
\$6 to \$10/item	62% (9%)	10% (1%)	11% (2%)	18% (3%)
More than \$11/item	36% (2%)	17% (1%)	17% (1%)	31% (1%)
Overall	54%	16%	9%	21%

The survey also asked respondents about what would be most likely to keep them from recycling electronics. Just over one-third cited cost, but nearly as many said they wouldn't know where to take the electronics—a barrier that could hopefully be overcome through outreach. Sizeable groups said either there was not a convenient location near them (13%) or they were unable to transport electronics to a collection site (10%). The lack of transportation was a bigger problem for some groups; 19 percent of respondents age 63 and older cited this as their biggest barrier to recycling electronics, as did 19 percent of respondents in households with incomes of less than \$25,000/year.

Results from the 2010 survey and a 2006 DNR household recycling survey that asked similar questions do show some changes in how residents are managing unwanted electronics. With computers and TVs (both banned from disposal and eligible to be recycled under E-Cycle Wisconsin), a higher percentage of residents said they had recycled an unwanted device in the previous year (see Figure 9 and Figure 10). There was a particularly dramatic change in how residents handled TVs, with far fewer putting them in the trash, many more giving old TVs to friends or family, and fewer selling old TVs (most likely because older TVs were less useful after the switch to digital television).

Figure 7: Most likely barrier to properly recycling electronics

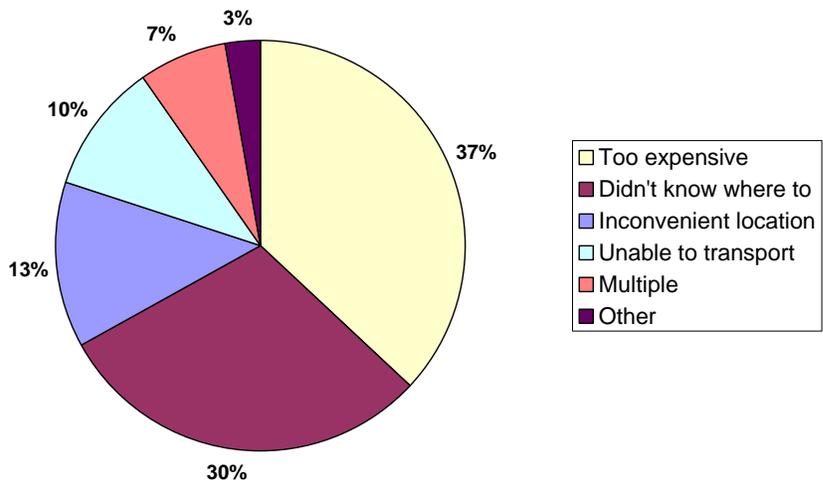


Figure 8: How did you dispose of your computer in the last year?

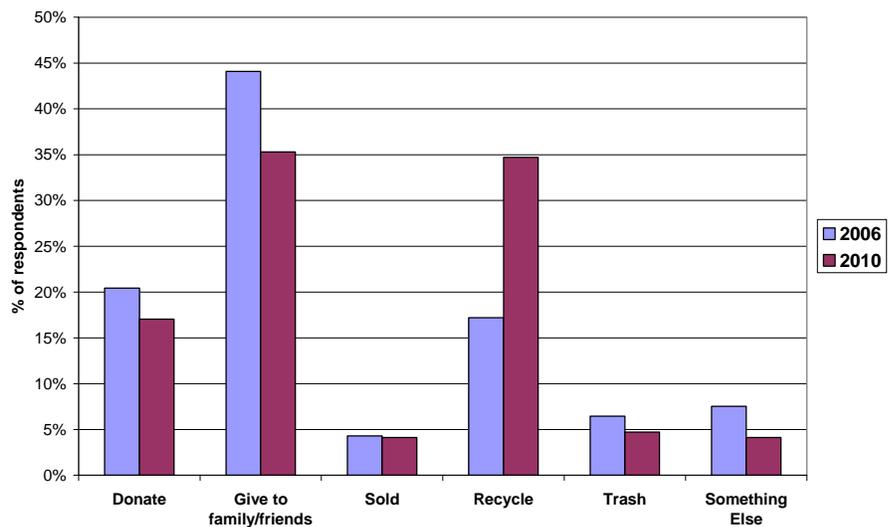
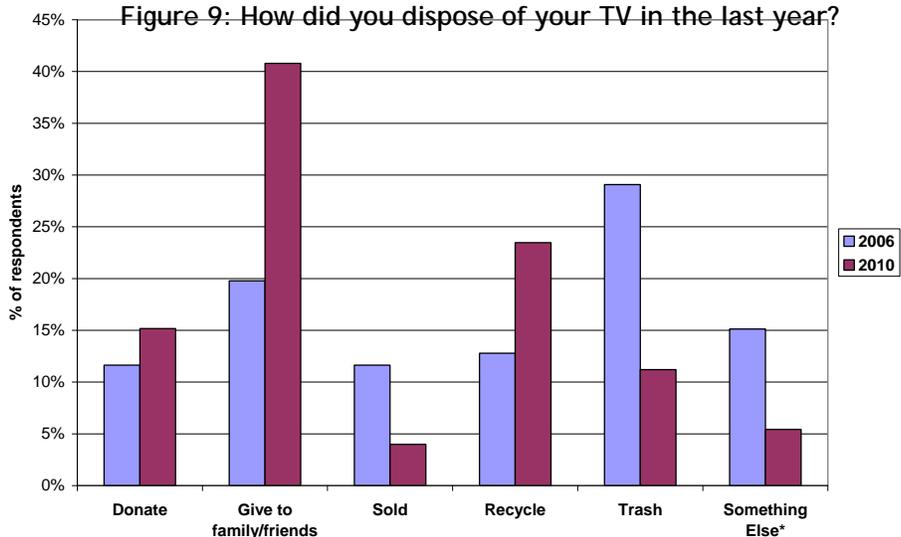
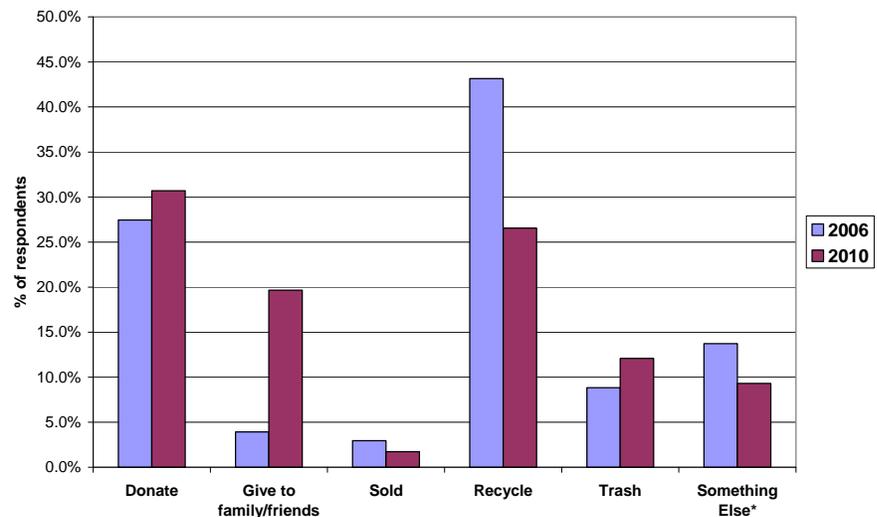


Figure 9: How did you dispose of your TV in the last year?



For cell phones (which are now banned from disposal but not part of the E-Cycle Wisconsin recycling program), the recycling picture is less clear (see Figure 10). Fewer residents recycled their cell phones in 2010, but there seemed to be a much greater reuse market (through both donations to charity and giving older phones to family and friends). A slightly higher percentage of respondents in 2010 reported throwing cell phones in the trash, which may be due in part to the increasing number of phones and frequency with which consumers upgrade to new phones.

Figure 10: How did you dispose of your cell phone in the last year?



Economic impacts of electronics recycling law

Informal surveys of registered recyclers and registered local government collectors in early 2011 showed that the electronics recycling law is producing some of the economic benefits expected from product stewardship legislation. The electronics disposal bans and manufacturer-subsidized E-Cycle Wisconsin program appear to be reducing local taxpayer costs while strengthening the electronics recycling industry in Wisconsin and neighboring states.

Generally, registered recyclers that have been active in the program see the law as positive for business. They report increasing collection volumes thanks to disposal bans and take-back programs in Wisconsin and neighboring states. At least two new recycling facilities have opened in Wisconsin since the law took effect and several others have expanded. Recyclers have added shifts and workers to meet demand and have also hired a number of local haulers and other businesses to support their growing collection networks. Many of the recyclers have been able to accept eligible electronics from residential collection programs and K-12 public schools for free or even pay a small rebate for some items. A core regional network of major recyclers is developing to serve take-back programs in Illinois, Indiana, Michigan, Minnesota and Wisconsin.

It does appear that the law may be having negative effects on a few small recyclers. Some report they are not able to compete for manufacturer contracts and are facing increasing competition, plus higher costs to meet program requirements. The DNR has worked to facilitate relationships among small and large recyclers, including a pilot program that allows registered recyclers to sell credits for processed EEDs to each other, reducing the need for all recyclers to have direct relationships with manufacturers. A number of recyclers have participated in the pilot program during the first two program years.

In the survey of local governments collecting electronics under E-Cycle Wisconsin, nearly all report reduced costs and/or lower fees compared with before the program began. Two reported they are saving more than \$100,000 per year despite having expanded their programs.

The feedback from the local governments also showed there are a number of different models for how local governments are adapting to the new system.

- At least two groups of local governments successfully bid out a joint electronics recycling contract, allowing them to share resources for the RFP process and benefit from better pricing from recyclers. A third group of local governments was working on a joint contracting effort in early 2011.
- Some county and municipal collectors have been able to reduce or end their collection role by working with businesses and others offering collection in their area
- Some municipalities have chosen to start collecting as a service to their residents, particularly after the disposal bans went into effect. Many have been able to take advantage of the joint recycling contracts in their areas or other favorable contracts offered by recyclers because of the manufacturer subsidy. Other local governments have been able to expand their collections (new sites or new materials accepted). Some of these new or expanded programs do require start-up costs.

Conclusions

The first program year was a learning process for everyone involved in E-Cycle Wisconsin. The DNR has received generally positive feedback on the program's implementation so far, especially on the information provided through the DNR's website and conference calls, meetings and correspondence with stakeholders.

While we do not have comprehensive data on electronics collection and recycling in Wisconsin before the new law, we do know that a number of new collection sites are being established throughout the state under E-Cycle Wisconsin. This gives state residents and schools unprecedented opportunities to recycle their unwanted electronics.

We expect electronics collection and recycling to increase during program year 2 and some fees charged to the public to decrease now that collectors, recyclers and manufacturers have stronger relationships in place. Early data from program year 2 are confirming these trends. Several collection and recycling businesses have started or expanded because of E-Cycle Wisconsin, which will provide a solid foundation for growth in the amount of electronic devices collected and recycled. We have seen good public response from our outreach efforts and expect program awareness and participation to continue to increase.

Importantly, E-Cycle Wisconsin's first full year showed that manufacturers, retailers, collectors, recyclers, local governments and individuals can work together under a shared responsibility system to increase the recovery of electronic devices. Increased recovery ensures that the valuable materials and embedded energy in these electronic devices are not lost to landfilling, but are returned to productive use by industries in Wisconsin and elsewhere.

For more information about E-Cycle Wisconsin, visit <http://dnr.wi.gov/ecyclewisconsin>. For questions about this report, please contact Sarah Murray at (608) 264-6001 or sarah.murray@wisconsin.gov.



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